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University of Criminal Investigation and Police Studies

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TABLE OF CONTENTS

PREFACE IX

I

ETIOLOGY, PHENOMENOLOGY AND TRENDS OF CONTEMPORARY CRIME

Teresa Russo
SEEKING A METHODOLOGICAL APPROACH TO COMBAT TRANSNATIONAL CRIME: A LOOK AT RESEARCH CARRIED OUT IN THE JEAN MONNET CHAIR EUVALWEB 2

Marjan Gjurovski, Mitko Arnaudov
COORDINATED RESOLVING OF CROSS-BORDER CRIMINAL ACTIVITIES AS A DETERMINANT IN THE PROCESS OF FURTHER WESTERN BALKANS INTEGRATION – CASE STUDY: SERBIA AND NORTH MACEDONIA 13

Aleksandar Jazić
TERRORISM, MONEY LAUNDERING AND HUMAN TRAFFICKING IN THE EUROPEAN UNION: TRENDS AND COUNTERMEASURES 22

Zvonimir Ivanović, Valentina Baić
IMPLEMENTATION OF MENDEZ'S PRINCIPLES IN OFFICIAL FORMS OF COMMUNICATION *IN PERSONAM* BY REPRESENTATIVES OF STATE AGENCIES IN THE REPUBLIC OF SERBIA 38

Bojan Janković, Saša Milojević, Boban Milojković, Srđan Milašinović
THE PERCEPTION OF THE SCHOOL POLICE OFFICER REGARDING THEIR RELATIONSHIPS WITH OTHER ENTITIES IN THE SCHOOL 54

Saša Marković
CERTAIN ASPECTS OF POLICE WORK IN COUNTERING IRREGULAR MIGRATION AND PEOPLE SMUGGLING 65

Krunoslav Antoliš
AN INSIGHT INTO THE PERCEPTION, BEHAVIOR AND IMPACT OF DISINFORMATION IN THE DIGITAL AGE 75

Katarina Živanović
EXTORTION OF STATEMENT BY POLICE – RESPECTING THE RIGHT TO REMAIN SILENT 96

Dejan Đurđević, Slaviša Lakićević, Sergej Uljanov, Ivica Stanković
TRAFFIC CONTROL TRAINING FOR POLICE OFFICERS CONTROLLING DANGEROUS GOODS TRANSPORT 109

Olgica Vulević
THE ROLE OF OUTLAW MOTORCYCLE CLUBS IN ORGANIZED CRIME WITH AN EMPHASIS ON MOTORCYCLE CLUBS IN THE NORDIC COUNTRIES 128

Alisabri Šabani
THE SOCIAL CLIMATE OF THE CLOSED PRISON IN ZENICA IN THE PERIOD FROM 1993 TO 2016: A LONGITUDINAL STUDY 139

Marjan Nikolovski, Davor Arsic
INTERNET RADICALIZATION AND THE POSSIBILITY OF SPREADING RADICAL IDEAS AND MATERIALS ON THE DARK WEB 150

Danijela Spasić, Radivoje Janković
TRENDS OF CHANGES AND GENDER DIFFERENCES IN INTELLECTUAL ACHIEVEMENTS AND PHYSICAL ABILITIES AT THE ENTRANCE EXAM OF THE UNIVERSITY OF CRIMINAL INVESTIGATION AND POLICE STUDIES 164

Natasha Peovska
THEORETICAL AND METHODOLOGICAL ISSUES REGARDING FEAR OF CRIME 178

Jovan Božović
ACTIVELY LISTENING TO REISS 187

II

CONTEMPORARY CHALLENGES IN DETECTING AND PROVING CRIME

Pablo Antonio Fernández Sánchez
THE APPLICABILITY OF THE RULES ON INTERNATIONAL CRIMES IN OUTER SPACE 198

Gábor Kovács
PREPARING HUNGARIAN POLICE CADETS TO DEAL WITH UNEXPECTED SITUATIONS AND LEAD OPERATIONS 227

Svetlana Nikoloska
CORRUPTION AND MONEY LAUNDERING IN THE REPUBLIC OF NORTH MACEDONIA 237

Marina Malis Sazdovska, Marina Mitrevska
FINANCIAL INVESTIGATION OF ENVIRONMENTAL CRIMES IN NORTH MACEDONIA 248

Vince Vári, Bianka Bodó
THE AGE RULES OF CRIMINAL DISCRETION IN HUNGARIAN AND INTERNATIONAL CRIMINAL PROCEDURE: ARGUMENTS AND COUNTERARGUMENTS IN FAVOR OF EVER-DECREASING AGE LIMITS 258

Sasho M. Stojanovski
INTERNATIONAL COOPERATION AND SPECIAL INVESTIGATIVE MEASURES 275

Ana-Maria Chepestru
THE DISTINCTION BETWEEN THE OFFENCE OF MASS DISORDER AND THE OFFENCE OF HOOLIGANISM 295

Marija Lučić-Ćatić, Muamer Kavazović, Edita Hasković
PROSECUTION OF HATE CRIME AND HATE SPEECH IN BOSNIA AND HERZEGOVINA 303

Radmila Trklja, Boban Dašić
CRIMINAL OFFENCES AGAINST THE ECONOMY IN THE REPUBLIC OF SERBIA 2018-2023 317

Branko Leštanin, Željko Nikač
MISDEMEANOR LAW PROTECTION OF PUBLIC ORDER: STATE AND TRENDS IN SERBIA 328

Jovana Banović
CLASSIFIED DATA AND CRIMINAL LAW – A NEED FOR CERTAIN CHANGES? 344

Naeem AllahRakha
JURISDICTIONAL CHALLENGES OF CYBERCRIMES AND THE ROLE OF THE INTERNATIONAL CRIMINAL COURT 357

III

NATURAL AND APPLIED SCIENCES IN FORENSICS, CYBERCRIME AND SECURITY

Aybüke A. İsbir Turan
CBRN THREATS AND SECURITY: THE ROLE AND IMPORTANCE OF FUNDAMENTAL SCIENCES, POLICE AND SECURITY FORCES 385

Hatidža Beriša, Katarina Jonev Ćiraković, Aleksandar Ćiraković
DARK WEB – BLACK DEEP BETWEEN PAST AND PRESENT 396

Alexandru Ioan
INNOVATIVE SOLUTIONS FOR SECURITY CHALLENGES: INTEGRATING NATURAL AND APPLIED SCIENCES IN THE EMERGING THREAT OF AI-DRIVEN CYBER ATTACKS – BIBLIOMETRIC ANALYSIS 406

Cheong Ju Kim, Fanny Ewann
CHALLENGES AND GAPS IN BIOTERRORISM'S DETECTION AND INVESTIGATION 420

Minja Blažić Pavićević
ENVIRONMENTAL DNA – eDNA 439

Zoltán Rajnai, Attila Nagy
THE NEXT DIGITAL ERA: POST-QUANTUM CRYPTOGRAPHY 449

Ksenija Butorac, Dubravka Maurer, Anja Batina
GEOGRAPHIC PROFILING – ENVIRONMENTAL AND OFFENDERS' BEHAVIOR PATTERNS OF ROBBERY CHARACTERISTICS 459

Peter Nyeste
MODERN CRIMINAL INTELLIGENCE IN HIGHER EDUCATION TRAINING AND PRACTICE 476

Nenad Korolija, Anton Kos
DETECTING DEPENDENCIES IN DATAFLOW KERNELS 485

Zoltán György Bács
NETWORK-RESEARCH BASED DYNAMIC METHOD IN CRIME PREVENTION AND INVESTIGATION 503

Béla Árpás
THE SPECIAL TOOLS OF THE CRIMINAL POLICE IN THE PREVENTION OF HOMICIDE 512

Nemanja Vučković, Nevena Prlainović, Nikola Milašinović
FROM WASTE TO LATENT TRACES VISUALIZATION: THE APPLICATION OF POLY(ETHYLENE TEREPHTHALATE)-BASED POWDERS IN DEVELOPMENT OF LATENT FINGERPRINTS 526

Gvozden Tasić, Marija Ječmenica Dučić, Jelena Radovanović, Dušan Veljković, Đurica Katnić
PREDICTION OF DETONATION PERFORMANCE AND STABILITY OF NEW CLASS HIGH ENERGETIC MATERIALS 553

Marija Janković, Jelena Krneta-Nikolić, Marija Šljivić-Ivanović, Nataša Sarap, Filip Veljković, Bojan Janković
NUCLEAR FORENSICS – TECHNIQUES FOR CHARACTERIZATION (EXAMPLE OF NUCLEAR TECHNIQUE USE) 566

Jelena Uvalić, Dragana Jovanović, Ana Branković, Snežana Đorđević, Biljana Koturević
DRUG USE STATISTICS IN SERBIA: ANALYSING A POPULATION'S DRUG USE STANCE ON CANNABIS LEGALISATION 581

Dragan Cvetković, Snežana Moretić-Mićić, Slađana Vujičić
THE IMPORTANCE OF FORENSIC AUDITING TECHNIQUES AND INSTRUMENTS COMBATING CRIMINAL ACTS 600

Jelena Vojinović-Kostić
FORENSIC LINGUISTICS AND POLICE WORK: STATE AND CHALLENGES 619

PREFACE

The international scientific conference "Archibald Reiss Days" was traditionally organized by the University of Criminal Investigation and Police Studies in Belgrade in November 2024. For the 14th time, this important and authentic international scientific meeting has drawn the attention of scientific thought and scientists from Serbia and Europe.

This year's Conference featured distinguished keynote speakers – eminent experts and scientists – including Prof. Zoran Stojanović, PhD, a retired professor from the University of Belgrade Faculty of Law, a doyen in criminal law science and one of the most frequently cited authors in the field of legal sciences in Serbia; Prof. Pablo Antonio Fernández Sánchez, PhD, from the University of Seville, Spain; and Prof. Teresa Russo, PhD, from the University of Salerno Faculty of Law, Italy.

This international trio has honored and enhanced the visibility and recognition of the distinctive scientific brand that the University of Criminal Investigation and Police Studies, as the youngest state university in the Republic of Serbia and an academic institution with a century-long history, organizes, develops, and promotes.

This year's Conference was attended by 87 authors from thirteen countries: Spain, Italy, France, Hungary, Moldova, Slovenia, Turkey, Uzbekistan, Bosnia and Herzegovina, Romania, Croatia, North Macedonia, and Serbia.

Among the authors are our long-time collaborators, as well as numerous colleagues who presented their paper for the first time at the Archibald Reiss Days Conference. Through the synergy of new and old collaborators, as well as the thematic coverage of scientific fields such as law, criminal investigation, sociology, political science, security studies, and police, forensic, and IT disciplines, the University of Criminal Investigation and Police Studies remains recognized and unique on the scientific level as a higher education institution that serves as a central academic hub for criminal investigation, IT, and forensic disciplines, which are studied within its three faculties.

Firmly committed to excellence in science, we strive to maintain quality through a rigorous selection of papers published in the Thematic Conference Proceedings, while remaining open to new collaborations and fostering traditional strong interinstitutional relations in science – both in the region, within the EU framework, and globally.

And last but not least, we hope that this Thematic Conference Proceedings will serve as a foundation for the development of further ideas in the scientific fields of the conference's main topic, *Etiology and Phenomenology of Contemporary Forms of Crimes*, and we eagerly look forward to the end of 2025 and the meeting of new scientific ideas and thoughts at the Archibald Reiss Days Conference.

With special regards,

President of the Scientific Committee of the Conference and Editor-in-Chief of the Thematic Conference Proceedings

Prof. Ivana Bodrožić, PhD

Ивана Бодрожић

I

ETIOLOGY, PHENOMENOLOGY AND TRENDS OF CONTEMPORARY CRIME

SEEKING A METHODOLOGICAL APPROACH TO COMBAT TRANSNATIONAL CRIME: A LOOK AT RESEARCH CARRIED OUT IN THE JEAN MONNET CHAIR EUVALWEB

Teresa Russo, PhD[1]
Department of Legal Sciences, University of Salerno, Italy

PREMISE

Since preventing and combating transnational crime is now a worldwide problem that necessitates collaboration between nations and domestic judicial and law enforcement authorities (Wilkitzki, 1999; Schomburg, 2000; Siegel, Van De Bunt & Zaitch, 2003; Obokata 2010; Haken 2011; Boister & Currie 2015), various international organizations have developed universal and regional regulatory answers to the problem. The establishment of the European Area of Freedom, Security, and Justice (FSJ), the adoption of instruments for judicial and police cooperation, and the provision of areas of criminal competence and criminal procedure have all contributed to a deeper level of collaboration within the European Union (EU), as is widely known (Ferola, 2002). Notwithstanding the fact that globalization has had both positive and negative, as well as preventive effects on crime (Viano, 2010; Wilson, 2023), there is a lack of a more comprehensive conceptualization of crime that extends beyond the guidelines of criminal law, and implementation and procedural challenges continue to exist at the national level because Member States are primarily responsible for both criminal law and criminal procedure (Damato, Pasquale & Parisi, 2011).

The Jean Monnet Chair EUVALWEB, which boasts the participation of eminent national and international scholars and practitioners, deals, among other topics, with the former cooperation in Justice and Home Affairs (JHA), focusing on the internal security of the Union, as well as of the neighbouring and future Member States. The JHA is one of the main areas that the accession states have to adapt to, taking on an external and foreign policy dimension of the Union. Within the European Union, the phrase "Justice and Home Affairs" refers to a range of topics including organized crime, drug trafficking, police collaboration, customs cooperation, immigration, asylum, and racism. Since these topics are inextricably related to national sovereignty, Member States have historically been unwilling to harmonize or create common policies regarding them. Furthermore, national policy approaches and legal and administrative systems differ significantly from one country to another. Consequently, European integration in this domain has advanced somewhat more slowly. The European Commission now has Directorates General Just (Justice and Consumer Affairs) and Home (Migration and Home Affairs), the European Parliament's specialized committee is known as the "Committee on Civil Liberties, Justice and Home Affairs" (LIBE), and the Council of the European Union, which is responsible for internal security, is still known as the "Justice and Home Affairs Council". Thus, while the Area of FSJ relates more to a goal established by the Treaties (Art. 3 TEU) that outline the ideal shape that European integration should take, JHA is still associated with politics and is still widely used.

1 trusso@unisa.it.

Such concerns were not included in the European Economic Community's (EEC) purview under the Treaty of Rome. First cautious efforts toward tighter collaboration among Member States in the areas of JHA were only made possible in the 1970s. As terrorist attacks spread throughout Europe in the 1970s and cross-border ties between terrorist organizations grew, it became increasingly evident that internal security cooperation was necessary. The TREVI working group, an informal, entirely intergovernmental network for information exchange (the acronym apparently stands for "*Terrorisme, radicalisme et violence internationale*"), brought together government officials from EEC Member States in 1975. The scope of TREVI progressively grew to cover topics including money laundering, drug trafficking, illegal immigration, and organised crime. Ministerial meetings were subsequently convened, although the institution persisted outside the framework of the EEC Treaty. Since the mid-1970s, the Union's competence in this sphere has gradually evolved, first established in embryonic form in the Single European Act and then in the Third Pillar of the Maastricht Treaty, although remaining firmly intergovernmental. This is at least until the Lisbon Treaty goes into force, which includes police and criminal justice cooperation in the European Area of FSJ (Russo, 2012). Nonetheless, as previously said, the subject remains a shared competence of the Member States, with a number of significant challenges identified throughout our research and discussed in the following paragraphs with specific reference to criminal judicial cooperation and the circulation of criminal judicial acts and evidence (Vermeulen, 2011; Russo, 2024).

SOME CRITICAL ISSUES REGARDING MUTUAL RECOGNITION AND CRIMINAL JUDICIAL COOPERATION

In particular, the fight against irregular immigration and police and judicial cooperation in criminal matters have assumed a central dimension of the European space in order to safeguard the security needs of the Union, which are also projected outwards and into its neighbourhood. Trends, which have emerged from our research, have shown a broadening of criminal offences as a result of the impact of European (but also international) law on national legal systems. However, the Union's criminal competence is indeed attributable to Art. 83 TEU, but it is closely linked to judicial cooperation, which is based on the principle of mutual recognition of judgements and judicial decisions (Nascimbene, 2011; Favilli, 2015; Pistoia, 2017) and, although seemingly unrelated to substantive issues, requires a certain degree of compatibility of cases in order to be exercised. In fact, the Court of Justice has explicitly stated that: "there is a necessary implication that the Member States have mutual trust in their criminal justice systems and that each of them recognises the criminal law in force in the other Member States even when the outcome would be different if its own national law were applied" (CJEU, judgment of 11 February 2003, Joined Cases C-187/01 and C-385/01, *Gözütok and Brügge*, Para. 33). This clarification is based on the assumption that judicial cooperation in criminal matters – but indeed the entire area of FSJ – is underpinned by a relationship of mutual trust between Member States, between judicial or enforcement authorities, which takes the form of respect for the common values on which the Union is founded in Art. 2 TEU, but also, pursuant to Art. 67, Para. 1 TFEU, "respect for fundamental rights, for the different legal systems and legal traditions of the Member States".

In this regard, for example, the relationship between transnational offences and the list of 32 offences referred to in Art. 2, Para. 2 of Framework Decision 2002/584/JHA – for which double criminality is waived for the purpose of issuing a European Arrest Warrant (EAW), where the offence is punishable by at least three years' imprisonment in the issuing State's criminal law – is especially relevant (Riondato, 2004). The list, which is not exhaustive, has major cross-border implications, including terrorism, human trafficking, corruption, other types of trafficking (drugs, guns, organs, cultural items, radio-

active substances, and so on), and cybercrime. The prohibition on double criminality unquestionably demonstrates a deeper convergence of the Member States' criminal laws. So much so that the list of 32 offences might be described as an unprecedented achievement in the process of establishing a single European judicial area based on mutual trust in the decisions of the other Member State(s), allowing transnational crime to be targeted more effectively. However, it has been stated that the "rationale" of double criminality is to assure "that suspects rely on similar legal treatment in both States and that no State shall be bound to hand over a person for non-criminal acts" (Panov, 2014: 12). In fact, the elimination of the dual criminality test does not guarantee homogeneity of treatment for the person concerned: the characteristic of the list of 32 offences is to certify that "the different effect" that may result from criminal proceedings in a first state is indeed considered acceptable by the second state, not constituting a lowering of protection to the detriment of transnational offenders.

As a result, it must be rejected that the list of 32 offences represents the expression of a common criminal law aiming at establishing basic standards long before Art. 83 TFEU. In actuality, European legislation ties the EAW to a "positive list" (Salazar, 2003: 7) of violations briefly designated by various *nomina iuris* and which should "result" as defined "by the law of the issuing Member State" under Art. 2, Para. 2 of the Framework Decision. There are no "minimum rules" established by EU legislation, as evidenced by Court of Justice case law. In 2007, the Court clarified that: "even if the Member States reproduce word-for-word the list of the categories of offences set out in Article 2(2) of the Framework Decision for the purposes of its implementation, the actual definition of those offences and the penalties applicable are those which follow from the law of 'the issuing Member State'. The Framework Decision does not seek to harmonise the criminal offences in question in respect of their constituent elements or of the penalties which they attract" (CJEU, judgment of 3 May 2007, Case C-303/05, *Advocaten voor de Wereld VZW* v. *Leden van de Ministerraad*, Para. 52).

Nonetheless, the EAW, which has implemented an "automatic" system based on the obligation to perform the requested act except in the scenarios expressly provided for by the regulatory provision, is motivated by the concept of continual and non-regressible mutual trust. In fact, the idea of "strenuous defence" of the EAW's automatism emerges from some Court of Justice decisions (CJEU, judgment of 25 July 2018, case C-216/18 *PPU, LM*, Paras. 72-73). On the contrary, despite its merits in the fight against transnational crime for the "rapidity" in the transfer of perpetrators from one Member State to another (Lavenex, 2007: 767), a number of additional "procedural" criticalities have emerged related to the diversity of national criminal procedural systems and the protection of fundamental human right guarantees (Alegre & Leaf 2004; Peers, 2004; Mitsilegas, 2006). In this direction, the Court of Justice's most recent judgements provide guidance on the hypotheses in which mutual confidence is shattered, with the broadening of the grounds for optional non-execution of the EAW, such as in the case of a systemic or generalised deficiencies concerning the independence of the judiciary (CJEU, judgment of 17 December 2020, Joined Cases C-354/20 PPU and C-412/20 PPU, *L and P*; CJEU, judgment of 22 February 2022, Joined Cases C-562/21 PPU and C-563/21 PPU, *X and Y*) or in the case of a real risk of detention conditions involving inhuman or degrading treatment (CJEU, judgement 5 April 2016, Joined Cases C-404/15 and C-659/15 PPU, *Aranyosi and Căldăraru*; CJEU, judgement of 15 October 2019, Case C-128/18, *Dorobantu*).

As a result, the need to prosecute serious crimes clashes with the requirement to respect the suspects' and defendants' fundamental rights under the various provisions of national procedural laws, as well as the national judge's discretion in assessing individual cases. This has been even more evident in the acquisition and exchange of digital evidence, and more specifically of encrypted data, which have highlighted how the needs of law enforcement authorities in carrying out criminal investigations in the fight against the most serious transnational crimes jeopardise the privacy of the data and respect

for the procedural rules of evidence acquisition to be used in national criminal trials, as will be better demonstrated in the following paragraphs.

THE IMPACT ON NATIONAL CRIMINAL PROCEDURAL LAW OF THE FORMATION OF EVIDENCE A LOOK AT THE ENCROCHAT CASE…

Thus, in response to a request made by the Justice and Home Affairs Council in December 2016, the Commission investigated the use of cryptography in criminal investigations with pertinent stakeholders from a technical and legal point of view, demonstrating its mixed legitimacy. Ensuring cybersecurity and safeguarding personal information requires the application of cryptography. In fact, EU law underlines its responsibility to guarantee sufficient security for processing personal data (Art. 32 of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC, General Data Protection Regulation). On the contrary, in the context of criminal investigations, law enforcement and judicial authorities frequently face the difficulties brought about by criminals' use of encryption, which jeopardises their capacity to gather the data required as evidence in criminal investigations as well as to prosecute and convicted offenders. As demonstrated by the *EncroChat* case, there has been a rise in the usage of encryption for illicit reasons, which has an effect on criminal investigations.

Data from the EncroChat system was gathered by a Joint Investigation Team (JIT) led by Europol and made up of French, Dutch and Belgian investigators between April 1, 2020, and June 13, 2020, as part of Operation Emma 95. Specifically, the relevant authorities had been able to get into the servers and devices and decode the language, which allowed investigators in multiple European nations to access a significant amount of data. According to Section 7.2 of Eurojust's 2020 Annual Report, EncroChat phones are cell phones that have been altered to provide for the most secure and anonymous communication. Numerous pre-installed apps for encrypted texting, encrypted voice calls over the Internet, encrypted email sending, and note-taking were included with these phones. USB port, GPS, microphone, and camera were either removed or rendered inoperable. Furthermore, a dedicated feature allowing the instantaneous deletion of all data on the device with a given code was offered. End-to-end encryption made conversations safe and inaccessible (O'Rourke, 2020: 8–10). The Dutch provider of SIM cards used in many European countries had more than 66,000 SIM cards registered in the system, according to the French law enforcement authorities. This discovery was made possible by the start of an investigation into possible criminal conspiracy and the introduction of a Trojan virus inside EncroChat phones by the French police.

Upon deciphering the "notes" of numerous EncroChat users, it became evident that they were definitely associated with illicit operations, specifically drug trafficking. The initial findings showed that 63.7% of France's active phone population was unquestionably utilised for illegal activities; the remaining 36.3% of phones were either fully deactivated or had not yet undergone evaluation. The French judges concluded that EncroChat users were almost exclusively criminal customers based on their assessment of the data collected during the first month of the trial. Assistance for the operation came from Europol and Eurojust. After the intercepts, the French authorities declared the method of data acquisition to be secret and proceeded to distribute the data in response to requests from the judicial authorities of the other European States, which were received through a European Investigation Order.

The validity of the processes for gathering, preserving, interpreting, and disseminating this evidence was called into question by numerous solicitors for individuals who had ended up in prison in a number of European nations. Particularly, some important points were made in support of the rights of suspects and defendants. First and foremost, on grounds of due process, as the accused was unable to confirm the legitimacy, correctness, accuracy, or even legality of the evidence used against them. In addition to generating a great deal of national litigation, the operation raised many questions regarding the trustworthiness and integrity of the evidence used in court cases throughout Europe. It is also likely that the hacking conducted by the French authorities involved the use of extraterritorial jurisdiction, which is against the sovereignty of individual Member States, as well as the fundamental rights of thousands of their citizens, such as the freedom of expression, the right to privacy and family life protection, and the right to personal data protection, without sufficient oversight by an independent judicial authority.

… AND THE ISSUE OF THE EXECUTION OF THE EUROPEAN INVESTIGATION ORDER (EIO)

Prior to the EIO, each State was free to determine its own judicial authority (*e.g.*, Art. 24 of the 1959 Mutual Legal Assistance Convention and Art. 6 of the EAW Framework Decision). In contrast, the new EU mutual recognition instruments have moved towards the introduction of a unique validation procedure by the issuing state prosecutor or court, which some have described as "*problematising the asymmetry between Member States regarding the role of the prosecutors*" (Erbežnik, 2023: 66–67). Furthermore, the delegation of judicial authority to law enforcement agencies in certain Member States resulted in the addition of a specific ground for refusal, such as in the Framework Decision 2008/978/JHA on the European Evidence Warrant (2008), although it is no longer in force (Art. 11, Paras. 4 and 5, in conjunction with Art. 13 of Framework Decision 2008/978/JHA).

The Directive creating the EIO (Directive 2014/41/EU of the European Parliament and of the Council of 3 April 2014, regarding the European Investigation Order in criminal matters, OJ L 130, 1.5.2014: 1–36), which instituted a validation procedure in the issuing State, provided a more comprehensive resolution to this matter according to Art. 2, Lett. c, No. ii). This provision seemed to be intended to prevent a contradiction between national (constitutional) rules and mutual recognition by utilising the greater protection that national legislation provides. The Court of Justice clarified in this regard the concepts of 'judicial authority' and 'issuing authority', within the meaning of Arts. 1, Para. 1 and 2, Lett. c) of EIO Directive, include the public prosecutor of a Member State or, more generally, the public prosecutor's office of a Member State, regardless of any relationship of legal subordination that might exist between that public prosecutor or public prosecutor's office and the executive of that Member State and of the exposure of that public prosecutor or public prosecutor's office to the risk of being directly or indirectly subject to orders or individual instructions from the executive when adopting a European investigation order (CJEU, judgment of 8 December 2020, C-584/19 PPU, *Staatsanwaltschaft Wien*, Para. 75).

Therefore, according to Art. 1, an EIO is a judicial decision which has been issued or validated by a judicial authority of a Member State ("the issuing State") to have one or several specific investigative measure(s) carried out in another Member State ("the executing State") to obtain evidence in accordance with this Directive. The EIO may also be issued for obtaining evidence that is already in the possession of the competent authorities of the executing State. For example, the EIO permits information gathering about bank and other financial accounts, evidence preservation procedures,

and the videoconference hearings of witnesses and those under investigation. An EIO may only be refused under specific conditions, such as where it serves vital national security interests and respects fundamental rights. Member States are required to recognise and carry out an EIO promptly (within the short deadline specified in Art. 12) and without additional formalities. The Directive additionally establishes stringent timelines for obtaining the necessary evidence; offers standard forms for completing an EIO (Annex A), acknowledging receipt (Annex B), and notifying another Member State of a telecommunications interception on its territory (Annex C); and includes a number of additional safeguards to protect the rights of the defence, specifically in Arts. 1, Paras. 3–4, 6 and 14. An EIO may be issued in accordance with Art. 6, Para. 1 if: (a) it is necessary and proportionate to further the proceedings mentioned in Art. 4, considering the rights of the accused or person under investigation; and (b) the investigative measure(s) sought in the EIO could have been issued in a similar domestic case under the same conditions. The scope of the assessment is heavily ambiguous because it is unclear if the verification of proportionality and equivalency requirements, which is the finding to be made by the issuing authority under Art.6, Para. 1, Lett. a) and b) of the Directive, must only pertain to the investigative measure that was requested or also take into account the specific investigative procedures that the executing State has already completed or will need to complete after receiving the EIO (Liguori, 2024: 5).

Investigative and judicial bodies are likewise prohibited from issuing an EIO that circumvents national law by Art. 6, Para. 1, Lett. b). This protection, however, does not meet the legal requirements set forth in Art. 8 of the European Convention on Human Rights (Armada, 2015: 18), which states that any interference by public authorities with an individual's right to privacy must be authorised by law in order to provide sufficient and effective safeguards against abuse (*ex multis* ECtHR, judgement of 9 December 2004, Application No. 41872/98, *Van Rossem v Belgium*, Para. 42).

The issue is significant because mutual recognition necessitates that the issuing authority accept these evidential results without having the option of concluding that the acquisition process used in the executing State was illegal. The mutual recognition principle simply forbids the issuing court from examining whether the process of acquiring evidence in the executing State was valid. However, this does not equate to granting it the authority to disregard the procedural protections established by its own system and meant to uphold the fundamental rights of those who are suspected of a crime or charged with it.

THE "REPERCUSSIONS" OF THE ENCROCHAT CASE…

Thus, the interception, decryption, and data preservation processes, as well as the investigative activities and digital evidence collected by the French authorities have been covered by the "*secret de la défense nationale*", *ex* Arts. 230-1 to 230-5 and 706-102-1 of the Code of Criminal Procedure. In an attempt to declare these rules unlawful due to their undue restriction of fundamental rights, the French Constitutional Court deemed the secrecy to be fundamentally respectful of the Constitution because the contested clauses allowed for a "*équilibrée conciliation*" between constitutional values, guaranteeing the right to an effective judicial remedy, the right to respect for private life or the right to freedom of expression (French Constitutional Court, decision of 8 April 2022, No. 2022-987 QPC, Paras. 19–20). The French Court of Cassation also considered this issue (French Court of Cassation, judgement of 11 October 2022, Appeal No. 21-85.148), by referring to the Metz Court of Appeal to remedy the procedural defect of the absence of *l'attestation de sincérité* of the results transmitted. This is probably because the French authorities have been at the heart of EncroChat from where data has

been shared internationally, thus "finding has the potential to affect the admissibility of EncroChat data throughout Europe" (Dickinson, 2022). Furthermore, two applications pending before the European Court of Human Rights (ECtHR, Application No. 44715/20, *A.L. v. France*; ECtHR, Application No. 47930/20, *E.J. v. France*), that claiming the violation of rights to privacy (Art. 8 ECHR) and to an effective remedy (Art. 13 ECHR) were declared inadmissible because the Court found that they had not satisfied the requirement to exhaust domestic remedies.

Nevertheless, the defence attorneys representing the intercepted individuals entangled in criminal cases across many European nations brought up the matter of authenticating the "lawfulness" of the actions executed in France as well as their dependability and credibility. In actuality, the requirements of State secrecy prevented the data from being shared with the other cooperating nations and from the defences learning about them. This prevented the exercise of cross-examination regarding the techniques used to form evidence, which is a crucial part of the right to a full defence. The process of obtaining the data, which the defendants were unaware of, was thus outside the scope of the judge's legality check and was no longer subject to challenge by the parties.

… IN THE DECISIONS OF SOME NATIONAL COURTS

Regarding the right to due process, the Netherlands' Supreme Court (*Hoge Raad*) decided that the usability of evidence obtained under EIO is primarily "ideal" or "formal." Indeed, in the absence of clear indications to the contrary (specific examples of "*concrete aanwijzingen voor het tegendeel bestaan*", Para. 6.6), the ruling inevitably upholds the validity of the foreign evidence. The Court concludes by holding that the right to know about evidence, and consequently the existence of injuries within one's personal sphere, is not an absolute right. This right must be weighed against competing interests, especially national security and the confidentiality of the investigative techniques used by the judicial police (Supreme Court of the Netherlands, judgment of 13 June 2023, No. 913). According to the Dutch Court's position, which has drawn particular criticism (De Vita & Della Bruna, 2023), the decision would subordinate the procedural order not to the rule of law but to the reason of state, mortifying the rights of the accused. Since all EncroChat messages are sent under pseudonyms, some authors have been particularly sceptical of the Court's reasoning when it suggests that the right to know the evidence is not absolute. Instead, they contended that in order to challenge evidence derived from the EncroChat operation, the data should have been accessible to confirm its reliability and integrity and, if possible, to find exculpatory evidence of suspects or defendants. In fact, judicial authorities must provide the defence with access to all relevant evidence they have for or against the accused in accordance with Art. 6, Para. 1 ECHR (Oerlemans & van Toor, 2022). Still, there is a limit to the right to have all pertinent evidence disclosed. There may be conflicting interests opposing disclosure in any criminal case. Certain evidence may occasionally need to be kept from the defence in order to protect other parties' fundamental rights or a major public interest, such as national security, because of the need to protect witnesses, or the necessity to maintain the confidentiality of police investigative techniques. Nevertheless, whatever challenges the defence may have due to a restriction on their rights should be suitably mitigated by the measures taken by the legal authorities to guarantee that the accused is given a fair trial.

Regarding the German judiciary, the Bremen and Hamburg Higher Regional Courts (*Oberlandesgericht*) maintained the pre-trial custody of individuals whose illicit actions were exposed due to the EncroChat hack. They decided that if the ongoing intercept is connected to illegal activity carried out by German residents, the data gathered by French police can likewise be used in domestic criminal

proceedings. The German Federal Constitutional Court case law (judgement of 7 December 2011, 2 BvR 2500/09, 2 BvR 185 7/10, paras. 115-116) was cited in the Higher Regional Court of Bremen (Bremen Regional Court, judgement of December 18, 2020, 1 Ws 166/20) case. This Court held that the right to due process and any express legal prohibitions should have been the only criteria used to determine whether information is admissible, as there is no other constitutional guarantee that sets a comprehensive standard for the use of information obtained or used illegally. Therefore, evidence in Bremen was deemed admissible as long as cross-border exchange and formal procedures for a European Investigation Order were satisfied.

In the other case, the Hamburg Court determined that because there was a lack of other legitimate, less intrusive possibilities, wiretaps on all phones should have been allowed (proportionality). The same Court decided that, in this instance, the defendant's device interception was appropriate given the scope of the drug trafficking charges against him and that, additionally, comparable measures could in any event be permitted under the German Code of Criminal Procedure (equivalency). The Hamburg Regional Court noted in its conclusion regarding the legality of the evidence transfer that it would be wrong ("*verfehlt*") to infer the legality of foreign acts and decisions from German criminal procedural law because this body of law does not apply to foreign matters. Fundamental rights included in the constitutional charter or those protected by the European Convention on Human Rights (ECHR) may be the criteria of assessment used in the domestic proportionality judgement (specifically, regarding the issue of an EIO, Para. 32). Moreover, it is established that the German public authority's obligation to protect fundamental rights essentially ceases when a sovereign and independent foreign state—in this case, France—determines the necessary course of a trial in accordance with its will (Para. 79). The German court here concludes that the defendant's phone tapping was appropriate given the significant amount of narcotics involved and the encrypted network, which necessitated such a step (Hamburg Hanseatic Higher Regional Court, judgment of 21 March 2021, 1 Ws 2/21).

Finally, the German Federal Court of Justice (*Bundesgerichtshof*) also believes that: i) the transfer of evidence is not contingent on the control of foreign law; ii) given their relevance, there was no breach of European law, human rights, or other fundamental requirements for the issuance of the EIOs; iii) the investigations are not linked to any mass surveillance hypothesis, so it is understood that the degree of necessity and proportionality required is lower than that otherwise provided for by the well-known European case law on mass surveillance. Conversely, the proportionality assessment, which is justified by the fact that EncroChat presented itself to the French authorities as a network intended from the beginning to support criminal activities and operate in secret, confirms the "presumption of guilt" against the suspects (German Federal Court of Justice, judgement of 2 March 2022, 5 StR 457/21, No. 038/2022). Nevertheless, it has been argued that "mass data were first exchanged via police channels and the subsequent European Investigation Order served only to rather rubber-stamp these operations without judicial oversight in Germany" nor would the conditions for interceptions laid down in Art. 31 of the Directive be fulfilled so as to render the evidence gathered inadmissible (Wahl 2022).

CONCLUSIONS. DIFFICULTIES IN FINDING A METHODOLOGICAL APPROACH TO COMBATING TRANSNATIONAL CRIMES

In conclusion, the national courts, albeit with differing logical-legal reasoning, conclude that the decrypted data obtained through European investigation orders is usable in the ongoing national trials. In particular, the aforementioned cases highlight the adherence to the principles of necessity/proportionality of criminal proceedings and equivalency of national criminal procedural law. The United

Sections of the Italian Court of Cassation (judgments of 29 February 2024, Nos. 23755 and 23756) have clarified that the rules governing the circulation of evidence between criminal proceedings apply when a European Investigation Order requests the transmission of the content of communications exchanged via cryptophones that have already been obtained and decrypted by the foreign judicial authority in criminal proceedings that are still pending before it (Arts. 238 and 270 of the Code of Criminal Procedure and 78 of the current provisions of the Code of Criminal Procedure). The Italian Public Prosecutor may lawfully request and obtain such evidence, which is already in the possession of the executing State's competent authorities, without requiring prior approval from the judge of the proceedings in which it is to be utilised. The Italian court must rule out the use of such evidence if it determines that its use will result in a violation of fundamental rights, although the burden of proving and claiming the circumstances from which such a breach is inferred rests with the party concerned. The defence's inability to acquire the technique used to decrypt the text of the communications does not indicate a breach of fundamental rights because the content of each message is closely tied to its encryption key, and an incorrect key has no prospect of decrypting it even partially. Unless there are specific accusations to the contrary, the possibility of data tampering must be ruled out.

Essentially, the equivalence with similar domestic cases must be measured in relation to the discipline of the "circulation" of evidence between different proceedings. This allows the Italian United Sections to rule that in this case, exceptionally, prior authorisation by a court of the issuing State is not necessary, since the corresponding EIO can be issued directly by a public prosecutor. As a result, even in cases where the required evidence had previously been obtained overseas through wiretapping or the purchase of phone records—that is, investigative activities requiring prior national judicial authorization—such authorisation would be disregarded. According to the Court of Cassation (judgement of 12 March 2024, No. 13535), the judge of the State issuing the European Investigation Order is responsible for evaluating (*ex post*) the observance of fundamental rights, the right to defend, and the right to a fair trial. In its ruling in Case C-670/22 of 30 April 2024 (Daniele, 2024), the Court of Justice of the European Union affirmed this reasoning (Para. 131).

As a result, the challenges associated with disparities in country procedural systems affect a methodological approach to combating transnational crime. The basis for the Unions actions to guarantee a system of cross-border evidence collection and to ease the flow of evidence throughout the European judicial system is a form of "adaptability" of national procedural laws. Furthermore, the lack of even a minimal level of uniformity in the regime regarding the admissibility of evidence and its use forces national authorities and attorneys to closely follow the core tenets of their own constitutional and procedural frameworks, which results in case-by-case solutions. The conclusions are also not yet totally definitive because some cases are still ongoing before national and European courts.

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COORDINATED RESOLVING OF CROSS-BORDER CRIMINAL ACTIVITIES AS A DETERMINANT IN THE PROCESS OF FURTHER WESTERN BALKANS INTEGRATION – CASE STUDY: SERBIA AND NORTH MACEDONIA

Marjan Gjurovski, PhD[1]
University of Ss. Cyril and Methodius in Skopje, North Macedonia

Mitko Arnaudov, PhD
Institute of International Politics and Economics, Belgrade, Serbia

INTRODUCTION

Modern security challenges, both at the global, but also at regional micro-level, require cross-border cooperation in the domains of dealing with risks and threats that potential modern security challenges can produce. The term involves modern challenges that do not recognise national and state borders, that do not recognize physical barriers, but their potential dangers are all-pervading. The paper deals with the challenges that most often do not recognise the economic development of the political entity, or the institutional stability and efficiency, because their influence is such that it usually manages to overcome even the obstacles of strong institutional frameworks that do not face a lack of resources. Perhaps, the best practical example in the process of confirming such a thesis is precisely the multi-decade struggle of the United States with migration waves on the border with Mexico, which despite huge financial expenditures by the US federal government, is still largely "penetrating" for migrants who want to migrate to the United States, but also for numerous criminal activities, such as drug routes and other opiates, including weapons. In fact, according to Mojanoski and Author1, global asymmetric threats pose a danger to representatives of the executive branch. The latest phenomenon of risk is the channels of illegal migration that go from crisis regions to territorial corridors... Among those migrants we have people who are religiously radical and extremely criminal (Mojanoski & Author1, 2018: 71).

In this context, it is very difficult to imagine how political entities with limited economic opportunities and institutional capacities could be positioned, above all the so-called developing countries, such as Serbia and North Macedonia. Bearing in mind the fact that these states are located in a region composed of political entities with similar economic and institutional capacities, the problem becomes even more apparent, because *de facto* there is no "barrier" that will indirectly influence cross-border security challenges to be overcome. In fact, such circumstances predict two possibilities in practice: one, that each country individually faces security challenges independently; second, to launch initiatives in regional frameworks through joint action, in the fight against cross-border security challenges, including criminal cross-border activities. The first option would probably be advocated by representatives of realism, justifying such a position with the thesis of constant hostility between subjects in international relations. In the specific case, claiming that the goal of each state is to get rid of crime, and

1 marjan.gjurovski@fzf.ukim.edu.mk

that it is precisely because of this that it is legitimate to export it to its neighbouring countries. On the other hand, modern theoreticians of realism, like structural realists, would probably go a step further and recognise the justification of cooperation between states in dealing with cross-border criminal activities, bearing in mind the pervasive effects of such security challenges.

To be more precise, this paper is based on the following foundations: first, on the limited capacities and resources of small states in an attempt to independently deal with contemporary criminal cross-border activities; second, the all-pervading effect of such international criminal activities cannot be prosecuted exclusively by sovereign and independent action without cross-border cooperation. In the case study of Serbia and North Macedonia, we will try to explain how modern cross-border crime requires joint action of political entities, but also how much this action in practice contributes to regional integration and cooperation. In the theoretical context, we will provide new support for the positions of structural realists, and we will use contemporary criminal cross-border activities as another answer to the question - why the cooperation in the field of security in modern international relations is necessary and not opposed to the concept of national security and is not endangering it.

WESTERN BALKANS CRIMINAL TRENDS

The Western Balkans region is faced with various cross-border security challenges of which immediate consequences are criminal activities that have an impact on all political entities in the region, but also on their societies. The authors emphasise hybrid criminal activities that directly involve the local population, but also international criminal groups that use the borders in the region in different ways in their attempts to realize broader criminal activities. In this context, the most current but also the most challenging cross-border criminal activities in the Western Balkans are those related to migrant routes, human trafficking, drug routes, and arms trade - on a regional and international level. In fact, the Western Balkans is faced with multiple cross-border criminal activities that require coordinated responses from political entities in the region, but also huge infrastructure and capacity investments in order to face such security challenges, which in most cases have an international character, which makes them almost unsolvable without even involving other external interested political entities. However, we must also bear in mind the direct impact on internal (national) security and stability, as explained by Mojanoski, Dimovski, Author1 and Ilijevski, "due to the threats and risks to the internal security, the countries of the world have given the intelligence agencies huge powers to fight against terrorism, organised crime, trafficking in drugs, weapons, people, etc." (Mojanoski, Dimovski, Author1 & Ilijevski, 2015: 91).

In this context, it is important to mention that the Global Index of Organised Crime from 2023 shows that the arms trade, which includes the six entities from the Western Balkans, is still higher in the region which is subject of this paper, than in the whole of Europe, i.e. that the Western Balkans has a score of 5.42 compared to the European average of 4.60 out of a total of 10, with 10 being the highest level of crime (Global Initiative against Transnational Organised Crime, 2024, May 18). Along the same line, it is also important to point out that according to the analysis of the South-Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons (SEESAC), the number of armed incidents related to organized crime almost tripled in the Western Balkans, rising from 49 to 134 in the period from 2019 until 2022 (Global Initiative against Transnational Organized Crime, 2024, May 18). Such tendencies indicate that the Western Balkans as a whole, as well as each political entity individually, is facing security challenges that arise as a result of criminal cross-border activities, which require multiple and multidisciplinary, at the same time strategic, but also tactical approaches

in order to enter into the process of facing and overcoming the problems. In addition to a coordinated response, modern cross-border criminal activities require strong institutions, efficient and effective in the fight against modern criminal phenomena, which is not always on the positive side when it comes to the Western Balkans, bearing in mind the level of systemic corruption on internal/national level in the region. In fact, in addition to the issue of coordination, institutional independence based on efficiency and effectiveness is the essence in attempts to deal with cross-border crime, as it is current in the area of the Western Balkans. In this context, when it comes to cross-border criminal activities and dealing with the same in the Western Balkans, we also have to mention the phenomenon of organised crime, widely permeated in the region and characterised by "its three basic elements: 1. organisational nature (firm and hierarchically established organisation); 2. the goal of criminal activity is to make a profit and achieve as much economic and political power as possible, and also to gain power; 3. connection with the state, its organs and influential economic and political subjects, which is achieved through various methods of corruption" (Bjelajac & Matijašević, 2013: 534).

Actually, we have reached a certain essence in understanding the existing challenges in the fight against cross-border criminal activities in the Western Balkans. It is actually the previously mentioned lack of strong institutions, based on the principles of independence, efficiency and effectiveness as a consequence of existing organised crime, including political corruption. Here is the core of the problem. Entities in the Western Balkans are faced with domestic and imported cross-border crime that is further strengthened by local criminal activities, which are further fuelled by the lack of efficient and effective institutional response, as a consequence of organised crime and political corruption in the institutional infrastructures in the region. Such circumstances make the Western Balkans additionally weakened and vulnerable in the fight against cross-border (local, regional and international) crime, which in the perspective leads in the direction of external direct support in order to realistically face the current security challenges.

COOPERATION BETWEEN SERBIA AND NORTH MACEDONIA IN THE FIELD OF CROSS-BORDER CRIME COMBAT

Regional Platforms

From the wider regional point of view, the Southeast European Law Enforcement Center (SELEC) represents a cornerstone in the process of cooperation in the area of crime and criminal cross-border activities. In fact, "it is a law enforcement, treaty-based, international organization that brings together the resources and expertise of Police and Customs authorities that join synergies in combating more effectively trans-border organized crime in Southeast Europe" (Southeast European Law Enforcement Center, 2024, June 15).

If we base our analysis on the task forces of this organisation:

- Task Force Mirage on Countering Trafficking in Human Beings and Illegal Migration
- Anti-Drug Trafficking Task Force
- Financial and Computer Crime Task Force
- Anti-Fraud and Anti-Smuggling Task Force
- Anti-Terrorism Task Force
- Container Security Task Force
- Stolen Vehicles Task Force and

- Environment and Nature Related Crimes Task Force (Southeast European Law Enforcement Center, 2024, June 18),

we could reach relevant explanation about the contemporary security challenges that do not recognise physical state borders and in that context require a joint platform on interstate level for facing them. In this context, the contribution of regional integration through the cooperation of state actors in dealing with cross-border crime was also recognised. It is a process that requires the exchange of information, joint investigative procedures, regional operations, analytical procedures, coordination of operational centres, working groups, joint projects and trainings, which is also part of the infrastructure of the previously mentioned organisation and *de facto* manifests the regional integration process.

The international legal framework with emphasis on regional cooperation in the field of human trafficking includes "specialized agreements concluded by groups of states. A notable example is the 2005 Council of Europe Convention on Action against Trafficking in Human Beings (European Convention on Trafficking in Human Beings), which entered into force in February 2008. This Convention has the potential to bind more than forty countries of Western, Central and Eastern Europe on a much higher level of obligation to protect victims than it is required by the UN Protocol on Trafficking in Human Beings. All participating countries of this Project joined the Convention - Albania, Bosnia and Herzegovina (BiH), Croatia, Montenegro in 2008 and Serbia and North Macedonia in 2009" (Briton & Maljević, 2010: 13).

Furthermore, one of the important mechanisms in the fight against cross-border crime is the so-called "SECI Center" platform, which is actually a regional operational organisation in Southeast Europe, founded in 1999 with the aim of strengthening and facilitating the cooperation of police and customs authorities of member states in the fight against cross-border crime. The SECI Center was launched after the member states have signed the Agreement on SECI in May 1999, which was subsequently ratified by all member states, making the agreement a legal framework for cooperation in the region, which Serbia and North Macedonia are also part of (Briton & Maljević, 2010: 51).

In this context, it is important to point out that although regional agreements introduce obligations only to the signatory countries, they also indicate useful information about the development of standards in this area to other countries. Such agreements can also contribute to the creation of customary international law in a specific area or issue (Briton & Maljević, 2010: 13).

Bilateral Agreements

When it comes to concrete cooperation between Serbia and North Macedonia in the fight against crime, it is important to point out that it is a multifaceted cooperation based on international agreements, but also on mutual (bilateral) interest in the necessity of jointly facing existing security challenges.

In this context, the **Agreement on joint control of border crossings** between these two countries was signed in 2019. The focus of the agreement is to "improve interstate cooperation in the fight against organised crime and corruption, the development of closer cooperation between the criminal police, the fight against drug trafficking, and the suppression of people smuggling, illegal migration and all other criminal acts that endanger the safety of citizens" (RTV, 2019, July 12).

Earlier in 2011, the **Agreement between Serbia and North Macedonia on legal assistance in civil and criminal matters** was signed. It is a contract that allows the signatory parties:

- Execution of procedural actions, such as summoning and delivery of documents, hearing of defendants, examination of witnesses, experts and other persons, investigation, search of premises and persons, temporary confiscation of objects;
- Application of special measures such as surveillance and recording of telephone and other conversations or communications and optical recordings of persons, controlled delivery, conclusion of simulated legal transactions, covert actions, search of the computer system or part of it and the data stored in it, as well as the processing of such data;
- Exchange of notices and delivery of letters and cases related to criminal proceedings, delivery of data without subpoena, hearing via audio and video conference connection, formation of joint investigative teams;
- Temporary surrender of a person deprived of liberty for the purpose of examination as a witness or expert or confrontation before the competent authority of the requesting state;
- Formation of joint investigative teams;
- Notifications from criminal records;
- Submission of data without a request;
- Transfer and takeover of criminal prosecution. (Zakon o potvrđivanju ugovora između Republike Srbije i Republike Makedonije o pravnoj pomoći u građanskim i krivičnim stvarima, "Sl. glasnik – Međunarodni ugovor", 2012).

Between these two countries, a **Memorandum on cooperation in the process of European integration** was signed between the Ministry for European Integration of the Government of the Republic of Serbia and the Secretariat for European Affairs of the Government of the Republic of North Macedonia, which, among other things, "envisages the exchange of professional knowledge and experience in the basic areas of administrative law, especially regarding judicial reform and the fight against corruption and organised crime". The focus of this memorandum is not exclusively in the areas of cross-border crime, but this very document confirms how important this domain of cooperation is, and how essential it is to all domains of interstate cooperation, including those concerning the coordination in the processes of realising foreign policy goals, such as this in the context of European integration.

A further step in the field of cooperation in dealing with cross-border crime was achieved with the signing of the **Agreement between the Government of the Republic of Serbia and the Government of the Republic of North Macedonia on Cooperation in the Combating Migrant Smuggling**. It is an agreement that contributes to essential institutional cooperation, and thus to integration through the following models specified in this agreement:

- Exchange of information and data
- Formation of joint investigative teams
- Implementation of joint projects and other activities
- Organization of joint trainings, workshops and seminars
- Exchange of experiences
- Exchange and protection of secret data (Zakon o potvrđivanju sporazuma Vlade Republike Srbije i Vlade Republike Severne Makedonije o saradnji u oblasti borbe protiv krijumčarenja migranata, "Sl. glasnik RS – Međunarodni ugovori", 2021).

Contractual cooperation in the prevention of migrant smuggling is a textbook example of the science of security concerning contemporary security challenges, arising as a result of cross-border criminal activities that do not recognize physical borders. Migrant smuggling, as a modern security challenge that does not recognize physical interstate borders in an absolute sense, is not only an example of the

necessity of interstate cooperation, but also of the necessity of all-pervading cooperation, bearing in mind the fact that this security challenge is faced equally by developing countries, as well as developed ones, regardless of the capacity they possess in the format of sovereign political entities.

At the bilateral level, the cooperation in the fight of cross-border criminal activities has been strengthened through the **Agreement on Cooperation in the Fight against Human Trafficking**. This Agreement governs issues concerning the cooperation of the signatory parties (Serbia and North Macedonia) in matters of prevention, identification, protection, referral, cooperation in criminal and other proceedings and the assisted voluntary return of victims of human trafficking who are citizens of the parties (Serbia and North Macedonia), and for the purpose of the improvement in the field of the fight against human trafficking.

In the context of achieving concrete effects based on the foundations of this agreement, concrete cooperation was agreed through the following methodological procedures:

- Exchange of information and data related to the identification of victims;
- Exchange of information with the aim of providing protection and assistance to victims of human trafficking and voluntary return to the country of origin;
- Exchange of information and data in criminal proceedings, with the aim of more efficient criminal prosecution of perpetrators of criminal acts, before sending formal requests for international legal assistance in criminal matters in accordance with the relevant national legislation;
- Implementation of joint projects in the field of prevention and fight against human trafficking;
- Organisation of trainings, workshops and seminars and exchange of experiences with the aim of strengthening capacities for the fight against human trafficking (Zakon o potvrđivanju Sporazuma između Vlade Republike Srbije i Vlade Republike Severne Makedonije o saradnji u oblasti borbe protiv trgovine ljudima, "Sl. glasnik RS – Međunarodni ugovori", 2021).

The Open Balkans initiative is also one of the numerous platforms that indirectly deal with the security challenges, risks and threats that participating countries face. Thus, in the framework of this initiative, an **agreement was signed** (Zakon o potvrđivanju Sporazuma o saradnji u veterinarskoj, fitosanitarnoj i oblasti bezbednosti hrane za životinje na Zapadnom Balkanu, "Sl. glasnik RS – Međunarodni ugovori", 2021) that also includes the regulation of food safety. This trilateral agreement is based on three pillars in the context of food safety:

- "To protect territories of the participating countries from introduction and spreading of quarantine harmful organisms and to limit the entry of regulated non-quarantine harmful organisms through imported consignments, as well as to limit the losses that occur as a result of their introduction and spreading;
- To prevent import and spreading of contagious animal diseases, products and food of animal origin, which are not safe and could be harmful to the health, with the aim of protecting human and animal health;
- To reduce to a minimum the phytosanitary, veterinary and health risks and at the same time to facilitate cooperation and ensure improvement of international trade" (Zakon o potvrđivanju Sporazuma o saradnji u veterinarskoj, fitosanitarnoj i oblasti bezbednosti hrane za životinje na Zapadnom Balkanu, "Sl. glasnik RS – Međunarodni ugovori", 2021).

On the other hand, but also along the line of contemporary security threats and risks in the Open Balkan framework, leaders of the participating countries have announced their determination to conclude a framework arrangement on regional cooperation in responding to civil emergencies, established on the progress already reached in the field and coordinated with the UN Development

Program, the European Union (including its Civil Protection Mechanism), and other regional and international organisations that have helped to build practices of cooperation and preparedness. The focus of this arrangement would be:

- "Providing the help by each of the participating country based on its possibilities upon a request;
- Coordination with the rest of the region on the ongoing basis, so that assistance can be used efficiently;
- Collaboration on the ongoing basis in procurement with a view to increasing the response capacity of the region as a whole;
- Participation in planning and training exercises as agreed, so that the first responders and those who coordinate them will be best prepared;
- Coordination requests to the European Union, international agencies, and other regional bodies working on emergency response for resources, training, and assistance in improving the resilience and response of the region to humanitarian disasters, both natural and manmade; and
- Strengthening cooperation on the structured basis between agencies and research centres specialised in addressing and managing civil emergencies" (PKS, Deklaracija Tirana, 2019, December 21).

In fact it is in formal sense a "Memorandum of Understanding on Cooperation in Protection against Disasters in the Western Balkans" (Jelisavac Trošić & Author2, 2023: 75) which, bearing in mind contemporary security threats as a consequence of climate changes and challenges, could in a huge manner contribute to the process of preventive action on regional level, but also in the process of regional coordination. Cooperation in the areas of security challenges in the Open Balkan framework, when it comes to dealing with natural disasters, is not directly related to cross-border crime, but it *de facto* represents another "step" forward in the process of regional cooperation and integration in the processes of dealing with modern security challenges. On the other hand, when it comes to food safety, the cooperation is closely related to cross-border crime, bearing in mind how many cases related to food and animal safety are included in contemporary international, regional and national criminal activities.

CONCLUSION AND RECOMMENDATIONS

When we talk about the phenomena of integration at the regional or bilateral level, such as economic or political, we are talking about directions of development of interstate relations that are mostly very easily visible, such as: creation of a common or single market, creation of a single labour market, abolition of mutual economic and customs tariff, joint positioning on certain foreign policy issues, frequent and cordial meetings of political leaders. On the other hand, when we talk about the cooperation in the areas of fighting cross-border crime and the integration potentials of this cooperation, we have to establish that it is a matter of bilateral or multilateral regional cooperation, which is more difficult to recognise, unlike the previously mentioned integration mechanisms. It is actually a matter of cooperation that implies the exchange of sensitive information and data, as well as experiences that are mostly not "visible" or known to society as a whole. But this does not mean that the cooperation in the areas of fighting cross-border crime is isolated in the processes of regional integration just because it is difficult to recognise or establish that it exists. In fact, the contractual basis at the bilateral and regional level is a sufficient *de jure* indicator. While at the same time, the provisions of these agreements are a textbook example of what essential regional integration actually represents, which is not only focused on the synchronised action of certain state institutions, but on the unified action of institutions

of different states, which implies a much higher degree than any coordination and synchronisation on a bilateral or regional level.

In the theoretical context, at the very end of this analysis, it is important to point out the Author2's perception who claims that the limited resources and capacities of a small state in modern international relations may possibly be compensated by synchronised political, foreign, economic security actions by these political entities (Author2, 2023: 136). Actually, the bottom line is that the neoclassical realists are completely right, i.e. that modern international relations represent a "struggle" for the acquisition of power between states, but in fact it refers the "struggle" that also assumes numerous forms of cooperation between states, on a regional and international level, which in essence represents the basis for gaining power in various domains, including the issue of dealing with cross-border crime on a national basis. It could seem illogical, but in practise, if we analyse the mechanisms of contemporary international society in the process of power gaining, we will reach a conclusion that in different senses power at the same time represents cooperation and integration in different areas of interests. Thus, regional cooperation on matters related to cross-border crime simultaneously has an effect on two levels: it provides essential contribution to the efforts for enhancing regional integration and furthermore provides additional power to national states included in this regional frameworks in their capacities in fighting the cross-border criminal activities. In fact, the cooperation in the fight against cross-border crime on the regional level provides double contribution in theoretical sense: from the point of theory of regionalism it emphasises the importance of regional cooperation and further integration, while from the point of the positions of neoclassical realists, it confirms the thesis of continuation of the "battle" for power between states, but in the contemporary context - through different mechanisms based on cooperation.

In the context of recommendations, authors have suggested the following practical measures in the process of enhancing regional integration, followed by cooperation, especially in the domain of fighting cross-border criminal activities:

- Establishing cooperation exclusively with professional staff
- Constant political support for cooperation in this domain, released from the "burden" of bilateral and regional disputes
- Synchronisation of legislative frameworks in this domain, as a mechanism for greater efficiency and effectiveness
- Unified database and exchange of data on cross-border criminal activities
- Creation of centres with 24/7 coordination capabilities
- Creation of mixed prosecution teams in order to prevent the potential of the corruption phenomenon
- Inclusion of other political entities in the region in order to create a unique space for dealing with the security challenges brought by cross-border crime

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TERRORISM, MONEY LAUNDERING AND HUMAN TRAFFICKING IN THE EUROPEAN UNION: TRENDS AND COUNTERMEASURES[1]

Aleksandar Jazić, PhD[2]
Institute of International Politics and Economics, Belgrade, Serbia

INTRODUCTION

There are certain phenomena on the territory of the European Union (EU) whose development directly threatens its stability and normal functioning. These are phenomena that are interconnected and reinforce each other. That is why the EU's approach to eliminating these phenomena is often similar. Preventing terrorism, money laundering and human trafficking requires investment of great effort and financial resources. On the other hand, these phenomena threaten the stability, normal functioning of the market and the security of EU citizens, which causes great costs. Some phenomena such as terrorism are not new on the territory of the EU, but there has been a change in its basis. With the development of technological means, terrorist groups have gained new channels for carrying out their activities. Many of these activities carried out on the Internet are not easy to identify and prevent. Of course, the EU invests great efforts and resources to prevent the activities of terrorists on the Internet. A similar situation exists when it comes to money laundering and human trafficking. Criminal groups active in this area have moved many of their activities to the Internet. These criminal groups rely on the imperfections of the EU's legal system, as well as the way the EU functions. More specifically, the absence of border crossings between EU countries corresponds to these groups. Therefore, the possibility of interrupting the activities of these criminal groups is significantly reduced. That is why prevention is one of the most important segments in the EU policy aimed at preventing money laundering and human trafficking. The basic subjects in whose jurisdiction terrorist acts are committed, as well as criminal acts in the field of money laundering and human trafficking, are the competent and judicial bodies of the member states. This situation requires strong mutual coordination and coordination in the action of the investigative and judicial bodies of the member states. This reduces the effectiveness of preventing the aforementioned phenomena and requires a greater expenditure of time. Terrorists and criminal groups are showing more and more freedom in carrying out their criminal acts, which is why EU member states have strengthened their penal policies. It is not only about increasing the duration of prison sanctions, but EU member states have introduced provisions in their legislation that affect financial and similar capacities. Now a significant part of their criminal legislation is devoted to the confiscation of assets acquired through criminal activities in the field of terrorism, money laundering and human trafficking. This applies not only to individuals, but also to legal entities that participated in criminal activities. An important part of EU policy in preventing terrorism, money laundering and human trafficking is raising public awareness and protecting individuals from the influence of terrorist and criminal groups. This prevents terrorist groups from recruiting new members, while criminal groups are prevented from finding victims that they use in human trafficking. In terms

1 The paper presents findings of a study developed as a part of the research project "Serbia and challenges in international relations in 2024" financed by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, and conducted by Institute of International Politics and Economics, Belgrade, during the year 2024.
2 jazic@diplomacy.bg.ac.rs

of preventing money laundering, the EU has put a lot of effort into preventing criminal groups from funneling their financial resources into legitimate businesses. A positive innovation in this direction is the cooperation established by the EU with legal entities in the field of economy and finance. The EU has established similar cooperation with legal entities operating in the field of providing Internet services and developing software technologies. In any case, the EU is improving its policies and activities in line with the changes made by terrorists and criminal groups in their activities. Thus, the EU keeps its system always ready to provide an effective response to any of the mentioned criminal activities.

TERRORISM AND COUNTER-TERRORISM IN THE EUROPEAN UNION

At the beginning of this part, what should be emphasized is the impact that globalization has had on the strength of the central government of the states. Globalization has influenced the weakening of the power of states as subjects in international relations, but also the weakening of the authority of their bodies. It is about changes in the internal arrangements of the states. New subjects appeared in the political systems of states, but also new actors on the international stage. The subjects that have appeared on the internal level have an increasing influence on the policies created by the central authorities. In the meantime, the role of certain global international organizations such as the United Nations (UN) has weakened. These transformations also affect security areas, as new threats emerge and strengthen old ones. At the same time, as already mentioned, the role of the state, which was the main guarantor of security, is weakening. The strength of states, but also the strengthening of certain security threats, is affected by the increasingly rapid technological development that spreads in all segments of society. In modern circumstances, the greatest threat to the stability of states is terrorism. Terrorist activities can cause instability in certain regions of the world and can pose a global threat. EU also is not immune to the actions of terrorist groups and their activities that can threaten its stable functioning (Јазић, 2014: 12-13).

Previous experiences with terrorism on the territory of the EU influence the contemporary perception of the member states. Before September 11, 2001, only six EU member states defined terrorist activities as serious crimes and a threat to national security. EU member states faced terrorism that was motivated differently. Due to previous experiences, in Germany and Italy attention was paid to ideologically motivated terrorism, while in Spain and Great Britain the focus was on separatist terrorist groups (Bureš, 2010: 52). The terrorist attacks in Madrid in 2004 and in London in 2005 showed that the first members of the European Union are the most important targets of terrorist organizations. The new members of the European Union, due to their support for the policy of the United Nations (UN) and the United States of America (USA) in Iraq and Afghanistan, have also become potential targets of terrorist organizations. However, the new EU members were not as attractive for attacks as some of the Western European countries were. There is an important difference between Islamic and left-wing terrorist organizations. It is a social base that left-wing terrorist organizations have always lacked. This base for Islamic terrorist organizations is constantly expanding due to war conflicts in Islamic countries and the failure of EU member states to successfully integrate the Muslim population into their societies (Bureš, 2010: 57). In previous periods, the perception of EU member states regarding terrorism differed from country to country. This is understandable if one takes into account that the experiences of the member states are different. That is why there was no common assessment of the dangers and risks that terrorism brings. The biggest problem was that the mentioned perceptions and assessments differed a lot from each other. Also, the exchange of information between member states took place outside of European institutions, while The European Union Agency for Law Enforcement

Cooperation (EUROPOL) did not have the authority to independently collect intelligence data. The EU did not have instruments to collect knowledge related to terrorism, and there was no single database. Therefore, it was not possible to effectively influence how EU citizens perceive terrorism. The intelligence agencies of the EU countries, and even the most powerful ones, did not have enough capacity to monitor, assess and respond to terrorist threats. That is why citizens and leading individuals in EU member states were not able to fully understand terrorism until their territory was affected. These reasons made it impossible to form a single EU policy regarding measures against terrorist activities (Bureš, 2010: 68-70).

Terrorism is a constant threat to the security and stability of the EU. There were a total of 1010 terrorist attacks on the territory of EU member states between 2009 and 2013. It is the total number of attacks that were carried out, interrupted or unsuccessfully carried out. The consequence of these attacks is 38 human victims. During 2013, 152 terrorist attacks took place only on the territory of five EU member states. Most took place in France, Spain and the United Kingdom. The EU was faced with the problem of its citizens leaving for foreign battlefields, where Syria stands out as the final destination of departure. These people may pose a threat to the security of the EU after their return. The presence of terrorism on the territory of the EU is not a new phenomenon. During the 70s of the XXI century, the EU faced left-wing terrorism. This problem was the most important factor in establishing cooperation between EU member states in the field of justice and internal affairs. This cooperation was established and developed within the TREVI network (*Terrorisme, radicalisme, extremisme, violence internationale - TREVI*). This network was established on July 1, 1975 as an unofficial form of cooperation. Ministers of justice and interior affairs from nine member states of the then European Economic Community participated in it. The terrorist attacks in the USA, which occurred on September 11, 2001, were a very important reason for the European Council to adopt the action plan on September 21 of the same year. The territory of Europe was affected by terrorist attacks in 2004 and 2005, and these attacks took place in Madrid and London. After the attack in Madrid, the European Council created the position of Counter-Terrorist Coordinator. Also, at the end of 2005, the Council of the European Union adopted "The European Union Counter-Terrorism Strategy". This Strategy was based on four main points, namely: prevention, protection, monitoring and response.

The procedure of extradition of perpetrators of criminal acts, including terrorists, has been significantly accelerated by the introduction of the European Arrest Warrant. This was implemented in 2002, and began to be implemented on the territory of the EU member states on January 1, 2007. Before the introduction of the European Arrest Warrant, the extradition procedure lasted on average about one year, while today the procedure takes about 16 days. The EU has implemented several initiatives aimed at preventing the financing of terrorism. The strategy in this area was adopted in 2004, and in 2008 it underwent certain changes. This ensures complete monitoring of money transfers in and out of the EU. It is the "4th anti-laundering package" approved by the European Council for Economic and Financial Affairs. In the meantime, there has been a development of police cooperation in the area of information exchange. EUROPOL provided information to EU member states on criminal phenomena. More specifically, now the competent authorities of the member states and EUROPOL have the possibility of accessing the database of persons seeking asylum, i.e. Eurodac, which strengthens the fight against terrorism and other serious crimes. A very important cooperation between competent authorities of EU member states in the field of combating terrorism is cooperation in the field of justice. Cooperation in this area was developed within the European Union Judicial Cooperation Unit (Eurojust), which was established in 2002 and one of its areas of work is the fight against terrorism. Through Eurojust, the formation of joint investigative teams and a judicial network in matters of criminal acts was made possible, thereby strengthening the fight against terrorism. In the middle of 2000, "The Convention on Mutual Assistance in Criminal Matters between the Member States of the European Union" was ad-

opted, which enabled direct contact between the judicial authorities of EU member states, without the mediation of central authorities. The exchange of information between the competent authorities of the EU member states regarding court judgments is made possible by the establishment of the European Criminal Records Information System (ECRIS). It is a network that enables the connection of criminal records of all EU member states. This made it easier to establish the mutual connection of persons in the planning and implementation of terrorist acts (Delivet, 2016: 1-3).

The EU counter-terrorist strategy on terrorist threats and activities was based on four pillars, namely: prevention, protection, pursuit and response. In order to implement this Strategy in practice, it was necessary to implement adequate activities at the national, European and international level. The goal was to reduce the threats and vulnerability of European societies to terrorist activities. Based on the four pillars on which the Strategy was based, it was necessary to prevent the recruitment of new terrorists, better protect potential targets of terrorist activities, find members of existing terrorist organizations and strengthen the EU's ability to provide an effective response to terrorist attacks. The last goal also included strengthening the EU's ability to effectively deal with the consequences of terrorist attacks. Finding solutions to existing conflicts, as well as promoting good governance and democracy, were important goals that should have been achieved in order to successfully implement the Strategy in practice. The most important point in *prevention* was to impede individuals from joining terrorist organizations, which will stop the emergence of new generations of terrorists. That is why the EU committed itself to preventing the radicalization and recruitment of individuals. In the area of prevention, the EU determined which methods, propaganda and conditions are used by terrorist networks to recruit new people. Of course, after that the EU implemented adequate countermeasures. The fight against radicalization and the recruitment of new people into terrorist organizations was under the exclusive competence of EU member states. Member states were leading this struggle at the national, regional and local levels. The problem is that this struggle exceeds the individual capacities of the member states, so it was necessary to include the entire population of the EU, as well as beyond, in this struggle. Modern technological development and globalization have made communication, travel and money transfer easier. That is why it is very easy for individuals today to take independent steps to join terrorist organizations. That is why it was necessary to detect such steps in time, through community policing and monitoring of individual travel to conflict zones in the world. There are certain preconditions in society that facilitate the radicalization of individuals. The most important preconditions are bad and autocratic state management, as well as rapid and unplanned modernization. Observing the EU countries as a whole, there are no such phenomena, but in certain parts of the European population these phenomena are present. That is why the focus of the EU in relation to these conditions was on neighboring and third countries, so the EU was heavily involved in promoting democracy, good governance, human rights, education, economic development and resolving existing conflicts.

Protection within the Strategy implies reducing the vulnerability of the most important targets and reducing the negative effects of terrorist attacks. Member States are responsible for protecting the most important targets. However, due to the great interconnectedness, border protection, transport security and other segments that have a cross-border character, joint action at the EU level was necessary. The European Commission had a particularly important role in strengthening standards in areas where existed a common security organization of member states. Those areas were, for example, border and transport security. By strengthening EU borders, it made it difficult for known and potential terrorists to carry out their activities within the EU. With the same goals, the EU paid attention to strengthening the security of airports, ports and airplanes, and this required the strengthening of standards in the field of internal and international transport security. An important area to which the Strategy referred is the protection of the most important infrastructure from physical and electronic attacks, and in the development of protection, emphasis was placed on potential terrorist attacks. Nevertheless, an

area of extreme importance was the protection of places of gathering of citizens and similar places, so collective activity at the EU level had a crucial importance in this. The problems faced by the EU in the field of protection against terrorist attacks required close cooperation with other international entities, especially when it came to preventing trade in weapons and chemical, biological, nuclear and radiological materials (CBNR materials).

The EU is firmly committed to continuing to *pursue* terrorists beyond its borders and to disrupt their activities. The activities that the EU implemented in this direction should: prevent the planning of terrorist groups, disrupt their networks, prevent terrorists from recruiting new individuals, prevent terrorist financing, prevent these groups from accessing the funds they use for their activities, and bring responsible members of terrorist groups to justice. The EU implemented these activities in accordance with human rights and provisions of international law. The member states put national security first in their activities, but they also paid great attention to the security of the EU as a whole. Competent EU institutions supported the activities of member states by encouraging the exchange of information and intelligence. It was necessary for member states to improve legislative provisions and response in order to have adequate means for collecting and analyzing intelligence data. This facilitated the investigation and prosecution of terrorist groups. In the second place, it was necessary to improve the cooperation and exchange of information between the police and the judicial authorities of the EU member states. The most important channels for these improvements were EUROPOL and Eurojust. In cases of investigations that have an international character, Joint Investigation Teams were established. In order to make police cooperation organized and systematic, EU planned to establish the availability of police information. Thus, police cooperation ceased to be based on individual cases. The ability of terrorist organizations to communicate and plan were disabled by preventing access to telecommunications data. An important goal of the EU in this sense was to deprive terrorist groups of the ability to freely use the Internet and thus spread technical knowledge that can serve the purpose of carrying out terrorist activities. Financing is very important for the survival and operation of terrorist groups. That is why the EU invested great efforts in hindering the financing of these groups. In the EU, legislative provisions related to money laundering and money transfer have already begun to be implemented. This included preventing the transfer of money to terrorist groups. That is why conducting financial investigations was part of the investigations conducted against terrorist groups, and financial investigations of abuse of the non-profit sector were one of the priorities. Pursue of terrorists must have a global character, because a large number of terrorist threats originated outside the territory of the EU. That is why the EU will continue to develop cooperation with international partners through dialogue and the adoption of agreements, and the most important place in this will be the UN and similar international entities through which this cooperation will be realized. The EU provided assistance and support to the countries it considers most important to establish certain mechanisms that served to prevent the formation of terrorist groups and networks.

The EU must be ready to *respond* to terrorist attacks when they occur and must always take into account that these attacks may have a cross-border character. The EU's response was similar to that in the case of disasters, regardless of how they occur. That is why the EU planned to use already existing mechanisms that were not specifically created for the purpose of fighting terrorism in the event of terrorist attacks, or in response to them. One such mechanism that the EU rely on is the European Union Civil Protection Mechanism (Union Mechanism). Joint action of EU member states based on solidarity is the only way to provide an effective response to a possible terrorist attack that would occur in a member state. One of the instruments for unifying the efforts of member states in response to terrorist attacks is the Union Mechanism. Also, by participating in the Union Mechanism, the member states show solidarity, which is important for the implementation of joint activities (Јазић, 2016: 67). The unity of the joint response to terrorist attacks within the EU was ensured by the development

of an emergency coordination agreements. These agreements were accompanied by the adoption of adequate operating procedures. The joint action of EU member states enabled a more comprehensive and effective response to potential terrorist threats and attacks. EU member states have the most important role in responding to terrorist attacks on their territory. However, it is necessary that the member states are ready to act unitedly and as a whole, because it may happen that these attacks are too large for the existing capacities of some of the EU member states. Such situations can pose a great danger for the EU as a whole, because the inability of one member state to respond to a terrorist attack can threaten other member states and the stability of EU institutions. That is why the European Commission and similar EU institutions have an obligation to support the efforts of member states to provide a collective response to terrorist attacks. EU member states developed their capacities based on a risk assessment that included an assessment of the ability to respond in the event of terrorist attacks. During these assessments, the basic parameters were potential terrorist attacks that have the highest chance of happening or attacks that can cause the most damage. It should be emphasized that the integral parts of the response to terrorist attacks are solidarity, assistance and compensation to the victims of terrorist attacks and their families. This was implemented at the national and EU level, and the member states were obliged to ensure the allocation of adequate compensation to the victims of terrorist attacks. The EU provides assistance to its citizens in third countries in the event of a terrorist attack in those countries. In addition, the EU provides assistance to its military and civilian structures engaged in crisis management operations. On the international level, the EU cooperate closely with relevant subjects, and the UN has a special place in that sphere (The European Union Counter-Terrorism Strategy, 2005: 6-16).

Subsequent EU counter-terrorism strategies have been improved over time. One such recent EU strategy, which was implemented from 2018 to 2022, additionally defined the goals to be achieved in the fight against terrorism. Those goals can be classified into three areas, i.e. prevention, prosecution and protection. *The prevention* of terrorism implies that, through criminal legislation and law enforcement, the realization of terrorist attacks, as well as their preparation, is impossible. Another goal within prevention should be achieved over a longer period of time. This means preventing radicalization that leads to involvement in terrorist groups. Preventing radicalization means preventing the recruitment, training, financing and spread of terrorist ideologies. Prevention does not mean only preventing terrorist acts, but also dealing with factors that favor the development of terrorism. Prevention activities include: (1) suppression of terrorist provocations, propaganda activities, radicalization, recruitment and training, (2) prevention of the aforementioned activities that are carried out on the Internet, (3) creation of risk assessment indicators that a terrorist act may occur, (4) raising awareness of radicalization and implementation of other preventive measures and (5) prevention of terrorist financing. *The improvement* of the prosecution of terrorists implies that the investigation of committed terrorist acts in the EU and outside it will be carried out in the most efficient and fastest way. This includes stable judicial and international cooperation within which the perpetrators of terrorist acts and other responsible persons will be held accountable before the court for the committed acts. It was agreed that the judicial authorities of the country where the terrorist was caught would initiate legal proceedings or he would be extradited to the country that requested him. Concrete activities within the scope of prosecution include: (1) collection of evidence and conflict zones for prosecution, (2) collection of electronic evidence in terrorism-related cases, (3) conduct of legal proceedings and prosecution of foreign terrorists, (4) mutual legal assistance, extradition and use of joint investigation teams and (5) establishing joint working groups on terrorism and transnational organized crime. *Protection* refers to the protection against terrorism of all persons who are in the territory of EU member states, regardless of whether they are citizens or only temporarily reside in their territories. The improvement of protection should ensure the safety of not only all persons, but also potential targets from terrorist

attacks. This especially applies to the most important infrastructure and public facilities. The field of protection also includes providing support to victims of terrorist attacks. Activities such as: (1) collection of best practices related to deradicalization, disengagement and reintegration into society, (2) risk assessment of persons accused and convicted of acts of terrorism, (3) assistance to victims of terrorism, (4) identification of new terrorist threats, (5) addressing issues related to the return of women and children who were involved in terrorist groups abroad and (6) the response of law enforcement and emergency services during and immediately after the end of terrorist attacks (Council of Europe Counter-Terrorism Strategy, 2018: 3-12).

ANTI-MONEY LAUNDERING IN THE EUROPEAN UNION: COUNTERMEASURES AND SANCTIONS

One of the most important documents related to the prevention of money laundering in the EU is the "Council of Europe Convention on Laundering, Search, Seizure and Confiscation of the Proceeds from Crime and on the Financing of Terrorism", which entered into force in mid-2005. Article 3 states that it is the obligation of the states to which this Convention applies to adopt legal measures that enable confiscation of financial assets and property in a value corresponding to the value acquired through money laundering. Given the nexus, states can adopt provisions that enable the confiscation of financial assets and property acquired through human and drug trafficking. The change in legislation made it possible to quickly identify, track, freeze and confiscate assets acquired through money laundering. The new national legislation of the member states made it possible to confiscate illegally acquired assets that have meanwhile been incorporated into legal flows, assets that were acquired in a mixed way with legally acquired assets and assets that were acquired on the basis of illegally acquired assets.

The adoption of new legislative measures has strengthened the position of courts and other competent authorities to order banks, financial and economic entities to submit their operational data, and now they have the authority to seize this data. Greater control over banking transactions linked to suspicious bank accounts is enabled. This includes the possibility of monitoring and submitting statements of bank transactions of suspicious accounts, as well as obtaining data on the accounts to which the transactions were directed. Due to the effectiveness of the investigation, the new provisions ensure that bank clients who are under investigation do not find out that their transactions are being monitored.

The Convention mandated states to introduce new legislative provisions that enable the determination of intentionally committed criminal offenses related to money laundering. These are criminal offenses when there is clear knowledge that one is participating in the illegal acquisition of property and that one wants to make a profit by using such property. This, of course, also includes the intentional introduction of illegally acquired property into legal flows through its conversion. Other crimes in this area relate to concealing the origin of income and helping other persons to illegally acquire property. The Convention provided for the amendment of national legislation, which will also include legal entities. In fact, these are individuals who have committed criminal acts in the field of money laundering on behalf of legal entities. Those individuals have a management position in the legal entity based on the authority they possess. These are the powers within the legal entity for: representation, decision-making and control. Legal entities, which are involved in money laundering in the previously described manner, will bear non-criminal and criminal consequences, which includes financial sanctions.

The Convention obliged the states to establish Financial Intelligence Units (FIU) through their legislation, but also to grant them the powers that enable the FIU to timely access information related to law enforcement, financial flows and administrative procedures.

As for specific measures to prevent money laundering, based on the Convention, states have amended domestic legislation in order to enable competent authorities to implement their powers in practice. The first authorization refers to the request to all individuals and legal entities operating in areas where there is a high probability of money laundering to: (1) identify participants in financial transactions, (2) report suspicions that money laundering is being carried out and (3) implement adequate support measures to the authorities to more easily determine whether money laundering has occurred. The second authority allows competent authorities to prohibit the possibility for persons under suspicion to learn: (1) that a report of suspicious transactions has been transmitted to the competent authorities, (2) that there is a possibility that an investigation into money laundering may be initiated, and (3) that an investigation into money laundering in progress. The third authorization provided the competent authorities with the possibility to monitor the activities of suspicious persons and, where possible, to conduct surveillance on them.

Within the framework of the Convention, the obligation of mutual cooperation of the states to which this document refers is established. States cooperate with each other on a very broad basis in order to effectively conduct investigations and court proceedings, the result of which should be the confiscation of illegally acquired property and income. This cooperation is implemented in accordance with the legal system of the country from which assistance is requested. On the other hand, the requested state must comply with the requests of the requesting state if those requests do not contradict the basic principles of its legal system (Council of Europe Convention on Laundering, Search, Seizure and Confiscation of the Proceeds from Crime and on the Financing of Terrorism, 2005: 1-8).

The main danger for the stability and functioning of the financial system of the EU, as well as for the security of its citizens, is money laundering and the financing of terrorist activities. It is estimated that between 0.7% and 1.28% of the gross domestic product of the EU is involved in money laundering. Over time, the EU has established a good legislative framework that prevents money laundering and the financing of terrorist activities. It is therefore important for the EU to continue to develop its legislation to keep up with the increasing integration of financial flows within the single market, technological developments, new trends in the financial market and the willingness of criminals to find loopholes in the system. In the financial sector, new rules regarding the exchange and dissemination of information should improve cooperation between individuals and institutions monitoring potential money laundering and terrorist financing. In the second place, the new rules should strengthen the compliance of the functioning of the European Banking Authority (EBA) with the rules of the EU. Thirdly, the new rules should strengthen cooperation in the fight against money laundering and terrorist financing. There are certain vulnerabilities related to the fight against money laundering, and they concern anonymous products, determination of beneficial owners and virtual assets. Vulnerabilities are also present in connection with the functioning of FIUs and financial supervisors.

In the previous period, there were cases that showed the failure of credit institutions to implement the provisions of the Anti-Money Laundering Directive. Those provisions concern risk assessment, detailed customer analysis and reporting of suspicious transactions and activities to FIUs. In a large number of cases, supervisors were able to react only after the occurrence of major risks or when they were faced with governance and compliance problems. It should be said that in certain cases the supervisors managed to identify deficiencies within the credit institutions in time and to demand supplementary activities. Group monitoring of the fight against money laundering and terrorist financing proved to be insufficient in the previous period. The division in management and supervision has led to a decrease in the efficiency of cooperation between competent entities. FIUs failed to establish adequate communication with taxpayers by providing reliable feedback on reports related to suspicious

transactions. Also, in the previous period it was seen that the exchange of information between FIUs of member states and FIUs of third countries was not sufficiently organized.

There are differences in the application of legislative frameworks related to money laundering, which indicates the existence of structural problems within the capacity of the European Union to prevent the possibility of using the financial system in illegal activities. A major threat to the integrity of the European Union's financial system is the shortcomings in the application of legal regulations, especially since there is an integrated market. In the coming period, the European Commission will continue to monitor the introduction of an improved legal framework and recommendations, as this authority is responsible for monitoring risks from a supranational position (Towards better implementation of the EU's anti-money laundering and countering the financing of terrorism framework, 2019: 1-5).

The EU passed a directive that helped member states shape their national legislation to fight money laundering more effectively. It is a document adopted in 2018 entitled "Directive (EU) 2018/1673 of the European Parliament and of the Council of 23 October 2018 on combating money laundering by criminal law". Member States have identified several intentionally committed acts that will be considered money laundering. The first act relates to the conversion and transfer of property. It is considered money laundering if a person converts and transfers property that he knows to have originated from criminal activities, with the aim of concealing the illegal origin of the property. Also, it is prohibited to help persons involved in such activities to avoid legal sanctions. The second part concerns the origin of the property. These are activities of concealing the origin, movement, location, disposition and ownership of property. It goes without saying that the person who carries out the mentioned activities has clear knowledge that it is about property that was created from criminal activities. The third offense refers to the acquisition of illegal property. Money laundering includes the acquisition, disposition and use of property known to have been obtained through criminal activities (Directive (EU) 2018/1673 of the European Parliament and of the Council of 23 October 2018 on combating money laundering by criminal law, 2018: 27).

The aforementioned Directive directed the EU member states to changes in their criminal legislation and in the part related to legal entities and their possible participation in money laundering. These are changes that include efficient and effective sanctions. These sanctions include criminal and non-criminal penalties, with several additional strong measures against legal entities involved in money laundering. These additional measures include: (1) loss of rights to public benefits and assistance, (2) temporary or permanent exclusion from public funding, (3) temporary or permanent exclusion from commercial activities, (4) placing under judicial supervision, (5) obtaining court order for liquidation and (6) closure of facilities of the legal entity that were used during the commission of the crime.

The directive took into account the development of international cooperation in order to make judicial processes faster and more efficient. That is why the member states are encouraged to amend their domestic legislation in order to strengthen the mutual connection of competent authorities. More specifically, it may happen that the criminal offense is committed in the jurisdiction of several EU member states. In that case, the member states will cooperate with each other to decide in which member state the trial will be conducted. During this cooperation, several factors will be taken into account, on the basis of which a certain member state will be assigned the implementation of the judicial procedure. Those factors are: the territory of the Member State where the criminal offense was committed, the nationality or residence of the perpetrator, the country of origin of the injured party and the territory of the Member State where the perpetrator was found (Directive (EU) 2018/1673 of the European Parliament and of the Council of 23 October 2018 on combating money laundering by criminal law, 2018: 29).

An important part of the EU member states' anti-money laundering policy is the supervision of the implementation of this policy at the level of the Union. At the moment, the supervision of the prevention of money laundering is the responsibility of the authorities of the member states. EU member states do not have the same financial opportunities, human resources and other capacities. The consequence of this is that the supervision of the prevention of money laundering is not at the same level in the EU, but differs from country to country. That is why one of the significant problems of the EU is the lack of an adequate system that would solve problems with money laundering that have a cross-border character. Therefore, it can be said that the EU framework for money laundering prevention supervision is only as strong as the competent authorities of the weakest member states. The development of money laundering can undermine the financial stability of the EU, so the EU will have to establish a strong system of supervision over the prevention of money laundering. This will enable the stable functioning of the common market and the banking system. The establishment of integrated supervision over the prevention of money laundering will strengthen citizens' trust in the EU and the reputation of the EU abroad. Also, this supervision will enable the implementation of rules on the prevention of money laundering at the EU level, but will also strengthen the cooperation of the relevant EU authorities. The authority that will be in charge of supervising the prevention of money laundering must have clear powers that will enable it to supervise and give instructions to national authorities. One of the possibilities is for the European Banking Authority (EBA) to become the main supervisory authority over the prevention of money laundering, while another possibility is the establishment of a new authority that would carry out that supervision. In addition, it is necessary to introduce a chief supervisor whose role would entail monitoring the entire process of preventing money laundering. One of the supervisor's tasks is to harmonize the practical activities of the competent authorities of the member states (Communication from the Commission on an Action Plan for a comprehensive Union policy on preventing money laundering and terrorist financing, 2020: 26-28).

NEW AND OLD WAYS OF HUMAN TRAFFICKING AND THE EU'S APPROACH TO PREVENTING THEIR ACTIVITIES

Analyses show that human trafficking increases when there are significant differences in income and population. On the other hand, the distance between countries affects the reduction of human trafficking. Economically developed countries are the most attractive for human traffickers to exploit their victims there, because they assume that they can make high profits in those countries. In countries with high standards, traffickers find it difficult to find their victims because of the small number of vulnerable populations. Regarding the influence of geographical distance, the analyzes show that people most want to move to countries with a higher standard, which are located near their home country. It is related to the way traffickers carry out their activities. Namely, human traffickers try to find their victims near countries that have high standards, and in which they intend to exploit them. Thus, traffickers shorten the time of their criminal activities, thus reducing the chances of being caught. Countries with strong institutions and an effective judicial system are not attractive to traffickers. They prefer countries where they can keep their activities secret and where there is little chance of being prosecuted. However, when it comes to finding victims, human traffickers carry out their activities in countries where there are strong institutions and judicial systems. If we are talking about human trafficking with the aim of sexual exploitation, the existence of legal prostitution in countries where the victims are exploited does not affect the reduction of human trafficking. Also, the existence of legal prostitution has no effect on human trafficking as a whole. It is noticeable that the police report a smaller number of victims of human trafficking than is the case with service centers. The reason

for this is the fear of the victims, because they are afraid of being deported to their home countries or prosecuted before the courts. A good and stable institutional system reduces the possibilities of exploiting victims, but in countries where victims are sought, good institutions do not affect the opportunities of human traffickers. The reason for this is that human traffickers in Europe "hunt" their victims through job offers, and less often through smuggling. Smuggling and illegal border crossing costs a lot, while based on a job offer, the victim quickly and easily crosses state borders. This method of searching for victims is particularly suitable in the EU, because there is no usual border control between the states. In this regard, traffickers mostly target individuals who do not need a visa to enter the countries where they will be exploited. That is why the police and competent authorities have problems identifying these individuals as victims before they are exploited, because these individuals usually realize that they are victims of human trafficking only when they arrive at their destination (Hernandez & Rudolph, 2011: 15-20).

In the middle of 2005, in Warsaw, the "Council of Europe Convention on Action against Trafficking in Human Beings" was adopted. The main task of the EU member states was to strengthen the coordination between the relevant authorities in charge of the fight against human trafficking. In addition, member states are obliged to create policies and programs that should strengthen preventive action in the field of human trafficking. These policies and programs are created through research, information, awareness raising, training, educational campaigns and initiatives of a social and economic nature. The most important individuals for whom these activities were intended are members of groups that may be exposed to human trafficking and experts dealing with the prevention of human trafficking. Also, these activities include non-governmental organizations and other parts of civil society that are active in the field of preventing human trafficking. EU member states are obliged to implement legislative, administrative, educational, social and cultural measures to strengthen the prevention of human trafficking. Other measures that should have been implemented in this area were: (1) research on best practices, methods and strategies, (2) raising awareness of the importance and role of media and civil society, (3) implementation of targeted information campaigns and (4) implementation of preventive measures that include educational programs for minors (Council of Europe Convention on Action against Trafficking in Human Beings, 2005: 3-4).

The Convention mandated EU member states to strengthen border controls in a way that would prevent human trafficking, but without impairing the free movement of people. A similar provision also applied to transport, and the emphasis was placed on company vehicles, which should prevent these vehicles from being used in human trafficking. Transport entrepreneurs are obliged to clearly establish that all passengers have valid documents required for entry into the country they are traveling to. EU member states are obliged to strengthen cooperation between border control services, which required maintaining direct communication. Also, the member states are obliged to ensure that the documents are of such quality that it will be very difficult to forge them and similar misuse. All competent authorities in member states should have trained professionals who have the knowledge to identify victims of human trafficking. These professionals should support the cooperation of different authorities in identifying victims, with a special approach to children and women (Council of Europe Convention on Action against Trafficking in Human Beings, 2005: 4-5).

EU member states are obliged to specialize individuals and authorities in the field of preventing human trafficking and protecting victims. It was ordered that such individuals and bodies be provided with the necessary independence in carrying out their activities. The specialization of individuals, including relevant officials, meant adequate training in methods of preventing human trafficking, prosecuting perpetrators and protecting the rights and safety of victims. Another task of member states was to establish coordination between governments, departments and other public agencies in activities

to prevent human trafficking. If necessary, coordinating bodies will be established. The Convention emphasizes the necessity of adopting measures that determine the jurisdiction of the member state in cases of human trafficking. In addition, member states are obliged to cooperate with each other through existing adequate regional and international instruments. The goal of this cooperation was supposed to be: (1) prevention and fight against human trafficking, (2) protection and assistance to victims and (3) investigation of crimes committed in this area. In the context of the development of mutual cooperation, a group of experts for the prevention of human trafficking was formed to supervise the implementation of this Convention. The name of the group is Group of Experts on Action against Trafficking in Human Beings (GRETA), and it is composed of 10 to 15 members. When including experts in this group, gender and geographical representation, as well as diversity in the necessary professional abilities, are taken into account. The members of GRETA are elected by the Committee of Parties for a period of 4 years, and after the end of the mandate they can be elected once more. Members are chosen from countries that have accepted this Convention, and no two experts from the same country can be in this group. The Committee of Parties is a body of GRETA, which consists of representatives from EU and non-EU countries that have accepted the Convention (Council of Europe Convention on Action against Trafficking in Human Beings, 2005: 12-15).

"Directive 2011/36/EU of the European Parliament and of the Council on preventing and combating trafficking in human beings and protecting its victims" was adopted in the middle of 2011 and improved the action of the EU in the field of preventing human trafficking. This Directive is part of the global fight against human trafficking, and it has also included third countries. In its articles, human trafficking is defined as gender-specific, that is, it is determined that men and women are recruited for different types of exploitation. Also, an integrated and comprehensive approach, as well as an approach based on human rights, was adopted in the prevention of human trafficking. Children are at greater risk of being victims of human trafficking, as they are much more vulnerable. That is why the interests of the child must have priority according to this Directive. The directive broadened the interpretation of what can be considered human trafficking. For example, subjecting a person to violent solicitation will be considered a form of commercial exploitation. It was established that the specificity of the situation in which someone became a victim of human trafficking must be taken into account, so there was an increase in punitive measures. For example, perpetrators who recruited a person who is considered vulnerable will be subject to stronger sanctions. In order to further protect the victims of human trafficking, it was established that these persons will not bear criminal sanctions for using forged documents, illegal migration and illegal prostitution. The reason for this is the fact that the victims are forced to commit these offenses. Also, victims will be protected from re-exposure to trauma and stressful situations by not being asked to repeatedly give a statement about the acts committed against them. That is why the Directive establishes that the competent authorities of the member states will make a video recording of the statement of the victim of human trafficking during the first examination. It was ordered that EU member states create and strengthen policies to prevent human trafficking, which includes activities to reduce the demand that encourages the development of human trafficking. Also, member states will implement measures that reduce the risks of someone becoming a victim of human trafficking, and these measures will include research into the transformation of human trafficking, information, raising citizens' awareness and education. The directive ordered the competent authorities of the EU member states to establish mechanisms such as national monitoring systems, i.e. national reporters. Their task is to analyze trends in human trafficking, collect statistical data, measure achieved results and report regularly (Directive 2011/36/EU of the European Parliament and of the Council of 5 April 2011 on preventing and combating trafficking in human beings and protecting its victims, and replacing Council Framework Decision 2002/629/JHA, 2011: 1-5).

In 2021, the "European Union Strategy on Combatting Trafficking in Human Beings" was adopted for the period from 2021 to 2025. The Strategy indicated that between 2017 and 2018 there were 14,000 victims of human trafficking in the EU. It is assumed that the final number is higher, as many victims have not been identified. Almost half of the victims of human trafficking are citizens of EU member states, and a large number of them were recruited and exploited on the territory of their own member state. Most of the victims are women who were subjected to sexual exploitation, and every fourth victim of human trafficking in the EU is a child. As far as finances are concerned, the losses caused by human trafficking on the territory of the EU amount to around 2.7 billion euros per year. Between 2017 and 2018, of the total number of victims of human trafficking, 60% were sexually exploited, while 15% were exploited at work. In the same period, 72% of the victims were women and girls, while 23% were men and boys. Human traffickers base their activities on social inequalities, as well as on the economic and social vulnerability of individuals. These inequalities and the vulnerability of individuals have been reinforced during the Covid-19 pandemic, as people are prevented from accessing justice, help and support. At the same time, the response of the judicial authorities to the committed criminal acts is difficult. The complexity of the human trafficking problem requires a comprehensive response. This implies the alignment of legal, political and operational initiatives that will be implemented on a broader basis. More specifically, the initiatives will cover all stages from prevention to conviction of perpetrators of crimes in the field of human trafficking, and the emphasis will be on protecting victims in all stages. Special attention will be paid to children and women, as well as victims who have been sexually exploited.

Legislation is the strongest tool in the fight against human trafficking, as it enables the definition of criminal acts, determination of punishments and common goals in prosecuting perpetrators. In this sense, the most important EU document is the aforementioned "Directive 2011/36/EU of the European Parliament and of the Council on preventing and combating trafficking in human beings and protecting its victims", so the European Commission provides support to EU member states in its implementation. That is why the European Commission established a knowledge base, offered guidelines and finances certain activities. Regardless, the number of prosecutions of perpetrators and passing judgments is not satisfactory. At the political and operational level, the existence of cooperation that has a cross-border, regional and international character is of particular importance. Human traffickers move across borders during the implementation of their activities, while at the same time their prosecution and investigation are the responsibility of EU member states. That is why EU agencies, such as EUROPOL and Eurojust, have enabled close cooperation and coordination between the competent authorities of the member states (Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions on the EU Strategy on Combating Trafficking in Human Beings 2021-2025, 2021: 1-4).

The main goal of the Strategy is to break the criminal model in order to stop the exploitation of victims. To this end, it is necessary to: (1) use effective operational means, (2) prevent the development of a culture of impunity through capacity building for an effective response by judicial authorities and (3) fight against the digital business model used by human traffickers. The use of effective operational means implies the use of means and approaches that hinder the acquisition of profits by organized criminal groups in legal channels. For example, traffickers rely heavily on entities that operate legally, such as hotels, nightclubs, and massage parlors. In these places, traffickers recruit individuals by signing legal contracts, but later transfer them to the country where they will be exploited. Competent authorities of member states have the task of including financial investigation in law enforcement investigations. Related to that, it is necessary to develop and use a strong framework that will enable the identification, seizure and confiscation of assets acquired through criminal activities in the field of human trafficking. The priority in preventing the development of a culture of impunity through

capacity building for an effective response by judicial authorities is to break the chain of human trafficking. This requires a strong response from the criminal justice system, which is a prerequisite for conducting effective investigations and prosecutions, as well as passing adequate judgments. In order to achieve this, it is necessary to hire individuals with expert knowledge in the field of preventing human trafficking from the relevant national and local authorities. The development of expertise should take into account the position and needs of the victims, which is especially important in cases where children are victims of human trafficking. That is why in these cases it is necessary to have trained individuals who are aware of the special vulnerability of children. Also, these individuals should have great knowledge about children's rights and the need for their protection during investigative and judicial proceedings. In the fight against the digital business model used by human traffickers, the ability of human traffickers to quickly adapt the way of conducting activities and the business model to changing circumstances should be taken into account. During the Covid-19 pandemic, human traffickers very quickly shifted their activities to the Internet. Human traffickers now use the digital space in all phases of their activities, i.e. in recruiting, transporting and controlling victims, advertising services that victims provide for them during exploitation, establishing contact with clients, mutual communication and acquiring property benefits. The development and use of technology have enabled human traffickers to expand their activities, and children are at particular risk of becoming victims of human trafficking via the Internet. That is why the plan is for the European Commission to establish a dialogue with the relevant technology and internet companies in order to get their support for reducing the use of internet platforms that enable the recruitment and exploitation of victims. These companies will be an important partner in preventing human trafficking, because they have the ability to easily identify and remove content from the Internet that is related to the recruitment and exploitation of victims. The same dialogue with similar goals will be established by the European Commission with the relevant authorities of EU member states (Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions on the EU Strategy on Combating Trafficking in Human Beings 2021-2025, 2021: 9-11).

CONCLUSION

In the paper, it could be seen that over time the EU has done a lot to strengthen its legislative system. This directly affected the legislative and judicial systems of its member states. Also, based on the data presented in the paper, it is noted that terrorist and criminal groups involved in money laundering and human trafficking function in a similar way. Therefore, establishing strong mutual ties would not be a problem for these groups. Given the strength of terrorist groups and criminal groups involved in money laundering and human trafficking, the EU succeeded in preventing their strengthening and further expansion of their activities. An important step in that direction was the EU's support for strengthening cooperation and coordination between its member states. In addition, the EU has influenced member states to establish or transform agencies that will exclusively deal with criminal activities in money laundering and human trafficking, as well as disrupting terrorist networks. These agencies are made up of individuals who have expert knowledge in the areas that are the subject of this work, which created the preconditions for effective prevention of the spread of criminal activities in the mentioned areas. The EU has succeeded in preventing further infiltration of terrorist and criminal groups into European societies by implementing measures that enable the confiscation of their financial resources and assets. With that, the EU protected its banking and financial system, thereby preserving the stability of the common market. Terrorist and criminal groups need constant recruitment of new members, i.e. finding new victims. That is why the EU placed the greatest emphasis on preventive action, which to a significant extent includes the education of young people and raising

the awareness of citizens. Strengthening prevention is very important, because terrorist and criminal groups are constantly adapting to legal changes and changes in the functioning of law enforcements of EU member states. Terrorist groups today function in a similar way as in the past, but they have also paid attention to their activities on the Internet. The same can be said about criminals involved in money laundering and human trafficking. Given that these activities are not easy to monitor, the EU pays great attention to the education of young people, as well as interested parties, in recognizing activities on the Internet that may be dangerous for them. What is very important is that the EU has paid great attention to the protection of victims of terrorist acts and human trafficking. EU legislation has included provisions that strengthen the protection of victims and enable them to receive certain compensations.

It can be assumed that in the coming period the EU will invest even more efforts in preventing criminal activities that take place over the Internet. In this way, the EU will respond to the increasingly rapid technological development on which criminal groups rely to a great extent. Also, further development of European legislation can be expected, which will be directed towards greater integration and coordination of judicial authorities and law enforcements of EU member states. This will strengthen the prevention of terrorist acts and criminal activities in the field of money laundering and human trafficking, and at the same time, the passing of verdicts for committed crimes will be accelerated. The current organization of the EU, which implies the absence of classic border crossings, will remain, but it is certain that the EU will find new forms of control of individuals, groups and transport.

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IMPLEMENTATION OF MENDEZ'S PRINCIPLES IN OFFICIAL FORMS OF COMMUNICATION *IN PERSONAM* BY REPRESENTATIVES OF STATE AGENCIES IN THE REPUBLIC OF SERBIA[1]

Zvonimir Ivanović, PhD[2]
Valentina Baić, PhD
University of Criminal Investigation and Police Studies, Belgrade, Serbia

INTRODUCTION

If we are considering holding conversations with citizens that are generally with representatives of state agencies or representatives of the executive or judicial authorities, it is necessary to state that such forms of communication must be specifically conducted by persons professionally trained for it. It also needs to be analysed and it is of great significance to draw certain conclusions from such an analysis. Namely, it is a specific form of communication between representatives of different forms of state power, administration - which implies the direct enforcement of the powers provided by law to these agencies towards citizens. It is about the immediate form of enforcement of the powers of state authorities in connection with direct interaction with users of services, but also the targeted subjects of the application of such powers by those state authorities. In this sense, the principles of applying the powers of state authorities in democratic societies imply respect for the principles and full respect for the human rights and freedoms of citizens when applying such powers. Such forms of communication and general communication of these authorities must be at a significantly high level in the form of meeting the minimum conditions that correspond to the frameworks created by the existing constitutional and legal frameworks. In this sense, it is very important to define certain principles, guidelines regarding the approach to citizens by such bodies that apply instruments of state power, so that there is no abuse of power or authority of such agencies. This does not mean solving these problems directly, but establishing a certain framework for such a thing, which would have to be a guarantee of protection for all participants in such a relationship. These principles are related to the communication and general relationship of state authorities with citizens regarding certain tasks and relations regarding the application of the legally defined powers of state authorities towards citizens. The basic dimension of the principle is related to the right of citizens to be treated in accordance with the norms of a democratic society, to respect human rights and freedoms, as well as to treat citizens in such a relationship in accordance with the preservation of their personal dignity and respect for their privacy. In this concept, it is also important to respect national, racial and ethnic, as well as cultural differences, and approaches differed on several levels during the development of democratic societies. Primarily, it is important to think about the existence of differences in the procedures in question, from the administrative (e.g. misdemeanor) up to criminal proceedings, which differ according to the subject on which the relationship is established - administrative, misdemeanour or criminal matters. When we contemplate about the relationship of state authorities to citizens, it is important to underline the

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2 zvonimir.ivanovic@kpu.edu.rs

obligation of state authorities in relation to citizens as users of the services of state officials and objects of actions of state authorities. It is a relationship that is defined by the laws and rules of procedures that are in question on the given relationship - administrative, misdemeanour or criminal, which also defines rights and obligations, as well as duties, i.e. coercive activities and powers of state authorities in predefined conditions, circumstances and situations. The subject of our analyses in this paper will be the criminal procedure and the application of Mendez's principles in the application of powers.

THE ETHICAL APPROACH

The development of an ethical approach to the interrogation (or police questioning) of suspects was introduced in 1984 in Great Britain with the adoption of new legislation (the PEACE3 Act) which prescribes the conditions for conducting interviews with different categories of persons by members of the police and the mandatory audio recording of conversations, and then with the adoption of the PEACE model of investigative interviewing in 1992 (Canter and Youngs, 2009). Then, a departure is made towards the earlier unsystematized and unscientific approaches in talking with different subjects and the modern British approach is established in a non-invasive ethical approach with the application of the PEACE model in conducting interviews (Forensic Interview Solutions [FIS], n.d.). The introduction of mandatory audio recording and later video recording (in 2010), this system has more opportunities for insight by independent subjects in the forms of preventing torture and the application of various forms of violence against persons, which, in any capacity, generally with representatives of state bodies and institutions. This form of insight and the possibility of supervision by specialized and independent bodies makes the approach very resistant to the use of torture methods and various forms of illegal access (Milne and Powell, 2010). The result of many illegal activities in the previous period by members of the police and improper procedures that resulted in wrong and unfair convictions of suspects who admitted to committing crimes under duress, in the form of a series of acquittals in various proceedings in Great Britain, led to the introduction of this method and a radical turn in the application of police powers. The PEACE interviewing model was introduced in 1992 as a new technique for questioning suspects, which takes place in five stages (Investigative Interviewing | College of Policing, 2013):

(i) Preparation and Planning.

(ii) Engage and Explanation.

(iii) Account, Clarification, and Challenge.

(iv) Closure.

(v) Evaluation.

The basic version of the PEACE model has evolved over the years to provide operatives with the most precise recommendations for implementation and to emphasize the importance of implementing certain tactics and skills.

These principles - the Mendez principles (*Principles on Effective Interviewing for Investigations and Information Gathering | APT*, n.d.), Méndez, J. (2016). have become one of the significant mainstream and supporting forces on a global scale where most democratic countries are beginning to implement them in their legal and penal systems, for example in the systems of Canada, the United Kingdom, the Republic of Ireland, Norway, New Zealand, Australia and Singapore (Bull and Soukara, 2010; Méndez

and Drummond, 2021a; Chin et al., 2022; United Nations Development Programme, 2022; Forensic Interview Solutions [FIS], n.d.).) and they are followed by those such as Hong Congo, Malaysia, United Arab Emirates, Iraq, Morocco, Indonesia, South Africa, Mexico and Fiji. In this direction, the initiative started by the delegation of Chile to the United Nations (UN) on October 14, 2022, is extremely important. with a publicly published statement of commitment to the application of Mendez's principles, which was supported by 77 delegations of representatives at the UN at the 77th session of the UN Assembly in New York. The support provided by the two largest international organizations in the world that deal with this issue has further strengthened the importance of applying the principles in conducting conversations and any live communication with state authorities. These are the UN Association for the Prevention of Torture (APT), as well as the Committee of the Council of Europe for the Prevention of Torture and Inhuman or Degrading Treatment and Punishment (CPT), which is repeatedly repeated in the cooperation of these institutions and all forms of organization for the application of Mendez's principles. Among other things, with the IMPLEMENDEZ project Cost action no. 22128, whose authors are members.

INTERNATIONAL LAW

The main legal standards underlying the principles are firmly grounded in international law, relying on international common law, treaty obligations, peremptory legal norms (jus cogens), and international, regional and domestic judicial practice (which, as is well known, does not represent sources of law, but are a very significant source of opinions and practical solutions within the framework of scientific doctrine). The framework of international law primarily consists of human rights standards, first the Universal Declaration of Human Rights, General Assembly Resolution 217 A (III) of December 10, 1948; International Covenant on Civil and Political Rights (ICCPR), General Assembly Resolution 2200 A (XXI), dated 16.12.1966. Geneva Conventions (*The Geneva Conventions of 1949 and Their Additional Protocols - ICRC*, 00:00:00.0), (United Nations Standard Minimum Rules for the Treatment of Prisoners (the Nelson Mandela Rules))[3] European Convention on Human Rights[4], Charter of Fundamental Rights of the European Union[5], the Convention on the Rights of the Child[6], the Convention on the Elimination of All Forms of Discrimination against Women[7], the Convention on the Rights of Persons with Disabilities[8].

The following guarantees of freedom and rights are extremely important within of the legal framework set up in this way:

a) Freedom from torture and other forms of ill-treatment[9] (right to humane treatment)
b) Freedom from arbitrary arrest and detention (right to liberty and security)

3 The United Nations Standard Minimum Rules for the Treatment of Prisoners (unodc.org)

4 European Convention on Human Rights (coe.int)

5 Charter of Fundamental Rights of the European Union (2000/C 364/01). Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:12012P/TXT (accessed on 07 May 2024)

6 Convention on the Rights of the Child adopted on 20 November 1989 by General Assembly resolution 44/25. Available online: https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-child (accessed on 07 May 2024)

7 Convention on the Elimination of All Forms of Discrimination against Women adopted on 18 December 1979 by United Nations General Assembly. Available online: https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-elimination-all-forms-discrimination-against-women (accessed on 07 May 2024)

8 Convention on the Rights of Persons with Disabilities adopted on 12 December 2006 by the General Assembly. Resolution A/RES/61/106. Available online; https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities (accessed on 07 May 2024)

9 Article no. 7. International Covenant on Civil and Political Rights (ICCPR); Art. 2. UNCAT; Art. 3. Geneve Conventions from 1949.

c) The right to the presumption of innocence
d) The right to remain silent and the right to be protected against compelled self-incrimination (also known as the privilege against self-incrimination)
e) The right to a fair trial
f) The right to protection against discrimination

As part of the UN international legal system against torture and other cruel, inhuman or degrading punishments and procedures - UNICAT[10] in Article 2. and Article 16. obligates all signatory members to take all (legal, administrative, judicial or other) effective measures to prevent and prevent the application of other documents on the introduction of cruel, inhuman or degrading punishments or procedures, which are not acts of torture established in Article 1, when such acts are committed by a representative public office or any other person acting in an official capacity, or at their instigation or with their express or tacit consent. In particular, the obligations specified in Articles 10, 11, 12 and 13 shall be applied by replacing the concept of torture with the concept of other forms of cruel, inhuman or degrading punishments or procedures. The "all effective" implies, as well as the practice of the Committee against Torture – CAT, to recommend a mixture of measures that include legislative, administrative, judicial and practical activities that are the result of analysis and extensive systematized and in-depth synthesis (undertaken by world-renowned experts) and for use within legal systems of the signatories. In this sense, the principles discussed here represent a very important reference for the application of UNICAT, which contains general obligations to respect and protect human rights, but also specific duties to fulfil effective measures in the prevention of acts of torture and acts equivalent to them. The application of the Mendez principles represents the fulfilment of obligations and duties provided for in addition to the articles 2 and 16 and articles 11, 10 and 15 of UNICAT.

It is important to repeatedly underline that the PEACE model completely rejects the term "interrogation" and exclusively uses the term "interviewing", which refers not only to conducting conversations with suspects but also with victims and witnesses (Schollum, 2005). Thus, the PEACE model is absolutely distanced from the accusatory sense and the concept of interrogation, which is directed exclusively towards the suspect.

The principles in question respect the fact that the outcome of information gathering activities and any conversation (often defined as an interview) between public authorities and citizens is related to whether a natural person enjoys and exercises all rights, at every stage of contact with public authorities, regardless of whether these meetings are called interviews, hearings, debriefings, interviews, investigations or interrogations. The principles provide a very significant alternative to the risks inherent in statements made using illicit means and methods (under coercion, the use of physical and other forms of force and pressure, as well as the brutality of torture) and which include a fuller and more visible application of the privilege of non-self-incrimination and recognize the fact that such tactics can lead to false confessions, unfair trials and undermine the administration of justice. According to the European Court of Human Rights, no legal system based on the rule of law can tolerate the production of evidence obtained through torture, because its application causes irreparable damage to the trial process as the basis of the rule of law[11]. Simply put, the presence of such illegal procedures amounts to the denial of the right to a fair trial and undermines any chance for the full realization of fairness and justice. The principles (Mendez principles) focus on several different legal guarantees in the form of freedoms and rights of man and citizen. In this sense, in addition to the situations described earlier, we should point out the basic freedoms and rights that the principles treat, for example, persons who are

10 Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment | OHCHR
11 European court of Human Rights Case: Ćwik v. Poland - 31454/10 Judgment 5.11.2020 available on https://hudoc.echr.coe.int/eng#{%22itemid%22:[%22002-12997%22]}

deprived of their freedom, whose movement is restricted for any reason, that is, who are detained by an authorized body. On this basis, the principles take the lead with the request to implement all legal and procedural forms of protection in the framework of conversations with any category of persons in all formal and informal procedures. In other words, the principles insist that before, during and after the conversation, constitutional, legal and generally accepted international guarantees of human rights and freedoms are safeguarded and enforced by state authorities. Therefore, it is all persons and not only suspects, accused in any sense. Fair treatment and treatment of persons with whom the interview is conducted is possible from the first contact of state authorities (but also other subjects) with the person participating in the formal interview and during the collection of information or notifications, as well as within the framework of court proceedings (principle 2). Mendez's principles contain specific guidelines regarding conducting interviews with certain groups with special needs or particularly sensitive witnesses (persons). Of interest for understanding in this text is the definition of these terms. In Serbian legislation, the terms "person with special needs" and "particularly sensitive witnesses" have different meanings and cannot be equated. Here's an explanation:

1) Persons with special needs:

   a) This term refers to people who have physical, psychological or social needs that require additional support or adaptation.

   b) Examples include people with disabilities, the elderly, people with chronic health problems, etc.

2) Particularly sensitive witnesses:

   a) This term refers to witnesses who are sensitive to certain traumatic events or have specific needs when testifying.

   b) Examples include children, victims of sexual or violent crimes, people with mental health problems, etc.

3) In short, "persons with special needs" refer to a more general category of persons who have different needs, while "particularly sensitive witnesses" are specifically witnesses who require special treatment in criminal proceedings
4) The principles underline and emphasize the need to assess specific needs in situations of increased vulnerability for those persons (due to their age, gender, sexual orientation, nationality, ethnicity, some form of Persons with special needs:
5) This term refers to persons who have physical, psychological or social needs that require additional support or adaptation.
6) Examples include people with disabilities, the elderly, people with chronic health problems, etc.). Or other risk factors).

The aim of this form of presentation of the principles is that in the future, as a very ambitious project, these principles will be fully applied in the legal practice of state bodies of the Republic of Serbia, in the application of laws and other regulations towards citizens.

Regardless of the status of the person with whom the interview is conducted, these principles form the minimum guarantees of human rights provided to citizens by all significant regulations concerning their human rights, regardless of the legal system in which they are applied. In this sense, it is very often stated that the principles are applicable to any system of legislation and that they are based on scientific, legal and ethical foundations that can be implemented in any context. It is possible to recognize the importance of principles for application not only by representatives of state bodies and public authorities, but also by other participants in the procedure - lawyers, supervisory bodies, members of civil society, etc.

The principles are defined in the following frameworks (Méndez, J. E., Thomson, M., Bull, R., Fallon, M., Tait, S. (2021b):

- Principle 1 - On the foundations, implies that an effective interview is based on science, law and ethics.
- Principle 2 - About practice means that an effective interview is a comprehensive process of gathering accurate and reliable information, with the application of related legal safeguards.
- Principle 3 - About vulnerability - an effective interview requires determining and addressing the needs of people in vulnerable situations with whom the interview is conducted.
- Principle 4 - On training, effective interviewing is a professional activity that requires special training.
- Principle 5 - About responsibility - an effective interview requires transparent and responsible institutions.
- Principle 6 - On implementation conducting an effective conversation requires the existence of strong measures and principles.

Empirical research in this area indicates the need for the principles (especially principle no.1. on the foundations) defined in this way to appear as a necessity when planning, preparing and implementing official conversations in any capacity with the category of natural person in the form of direct two-way communication, by representatives of state authorities. International legal standards and related professional duties, in this sense, require a specific context and environment that is a guarantee for the realization of human rights of natural persons involved in this process. From the aspect of natural and social sciences, in terms of research results within these principles, the results of empirical research in psychology, neurology, medicine, communication, criminology and sociology have been sublimated. The ideas of various theoreticians and scientists in the form of special methods of psychological and physical pressures to overcome resistance (e.g. Reid – deception not only represent illegal forms and measures in the work of representatives of state authorities in the process of conducting interviews with citizens, but also represent a significant inefficient tool with multiple negative consequences, as indicated by recent research in this area (A. Vrij et al. 2017, S. O'Mara, 2015, S.M. Kassin et al. 2010). Previous research has proven that methods that involve forms of coercion and whose techniques include overcoming resistance hinder and adversely affect retention capacities as well as encoding and reproduction capabilities. (S. O`Mara 2015, C.A. Morgan III, et al. 2013, K. Young et al. 2011). Also, some research indicates that unreliable information and false confessions resulting from abusive practices are a frequent and predictable consequence of poor interviewing techniques. (S. A. Drizin, & R.A. Leo, 2004, A.D. Redlich, & C.A. Meissner, J.L. Skeem et al. 2016), as well as that these forms of practice led to unjust convictions, and as wrong intelligence information, which undermines the goals and effectiveness of law enforcement and intelligence work (D. Starr, 2019; B.L. Cutler, et al. 2014, G. Lassiter & C.A. Meissner, 2010). Such results imply that in Serbia Art. 16 and Art. 84 of the CPC of the RS very significantly consider and indicate here their absolute applicability in each of the cases of illegal actions of all authorities involved in the investigation of the criminal offense. It is logical to conclude, and research confirms this (Vrij et al. "Psychological perspectives on interrogation"; S.C. Houck & L.G. Conway, (2015); M.A. Costanzo, & E. Gerrity, (2009).) that methods and techniques that contain forms of coercion and coercion always tend to reduce the interlocutors' willingness to cooperate, cause resistance even among well-intentioned and willing interlocutors, even though they are prohibited. Of course, when it comes to the application of various techniques that include abuse or other forms of gross coercion and coercion by the interrogator and getting answers from the tortured person, it is simply clear that this information is very questionable from the point of view of truthfulness and reliability, due to the desire to stop torture. Aside from the fact that they are prescribed as

illegal, as well as under the threat of procedural coercion and procedural sanctions of extracting the files and the impossibility of using them as evidence, that is, in evidentiary proceedings. In this area, research was also done that indicated that even those techniques that imply or include the application of psychological pressure, such as manipulation of the perception of the interrogated or interrogated person about his guilt (such as by presenting false or non-existent facts as evidence) or through manipulation understanding the consequences of a confession (minimization or augmentation of the consequences of the condemnation of the environment or the verdict that will be passed on the basis of the available facts, suggesting the possibility of a lighter sentence in the case of a confession, e.g. the RPM method (Napier and Admas, 1998).

An effective conversation (interview) is a comprehensive process of gathering accurate and reliable information, with the application of legal guarantees of respect for human rights and freedoms (Principle 2. About practice.). This is a complex process, and it is not made up of just one event. It includes all interactions of investigative and information-gathering authorities with persons providing information. It begins now when an individual is identified as the person from whom the representative of the official authority wants to collect information and continues during the interview itself and ends when the subject conducting the interview concludes that such a procedure of collecting data and information is over. Dealing with the interviewee before, during and after the process, all forms of communication, is crucial for the integrity of the process itself. It is a complex adaptive process involving human beings, human behaviours and human rights. The process is influenced by environmental conditions, and the outcomes can be influenced by the actions of the person conducting the interview and all involved competent acting authorities. The interviewer is, as a rule, focused on gathering information rather than gaining confession, and maintains a flexible rather than linear approach to successfully gather reliable and accurate data in such a statement. Realistically, every interview is different, so interviewers must use their best professional judgment when deciding on next steps at any given time, but in any case, they must follow these principles. The interest of the procedure and arriving at the truth lies in the fundamental application of these principles, which include all the rights defined in Art. 68 and 69 of the CPC RS. In particular, the practice provides room for analysis through CPT visits to countries that are signatories to the convention, and especially when compared and analysed against the response of the governments after the visit and publicly propagated report of the CPT.

Regarding the implementation of the rules CPT of the Council of Europe, has done multiple visits and the results of the compliance with the Conventions and treatment of the suspects and detained persons are very disappointing.

In the latest report dating from the 2023 visit to Serbia it is declared the following: "As regards the effectiveness of prosecutorial investigations, the CPT found that there was a lack of promptness and thoroughness in investigating cases of alleged ill-treatment by law enforcement officials, and a failure to apply appropriate investigative techniques. The CPT advocates for the work of the prosecutors to be reorganised with the appointment of specialised prosecutors, and for adapted investigative techniques" (CPT 2023. Report). Also, the following points have been mentioned in the report: "As mentioned in paragraph 7, the findings of the 2023 ad hoc visit to Serbia indicate that the treatment of persons deprived of their liberty by the police, particularly in the Belgrade area, has not improved since the visits in 2017 and 2021. Regrettably, the strategy to eradicate ill-treatment by the police, including most of the elements recommended by the CPT in its report on the 2021 visit, has not been drawn up by the Serbian authorities, and the Committee considers that the efforts made by the Serbian authorities to combat this phenomenon have so far been partial, fragmentary and lacking conviction." (CPT 2021 Report). It was said that zero tolerance from the highest political level on the unacceptability of ill-treatment by the police, is mandatorily needed. "The training activities on issues such as profes-

sional interviewing skills and on the theoretical and practical aspects of preventing ill-treatment need to be more targeted and less dispersed, as their impact cannot be measured solely by the number of police officers who have attended induction or refresher courses. Moreover, the measures to strengthen the legal safeguards of persons deprived of their liberty have only been partially implemented, and the failure to set up the mandatory audio-video recording rooms, which remain unused, along with the clear abuse of interview practices only serve to demonstrate the police's unwillingness to abandon certain working methods from the past, in the sense of so-called information-gathering techniques geared towards obtaining a confession". (CPT 2021 Report)

The defining of the vulnerabilities does not need only to be determined, but also to be supported by the system itself, since subcultures for instance of police or Public prosecutor could be very nasty in relation to the, for instance LGBTIQ+ people and further victimise them in different ways. So, principle No. 3 should be comprehensively leaning on the modern trends and new scientific and practical reasoning in determination towards vulnerable people. Also, in understanding what the vulnerability is and where and how it can be treated with respect to different roles in the procedure, as a suspects, victims, witnesses or any other. It is very much connected with the Principle no.4. since the training must encompass and include vulnerability themes, approaches and for instance rapport building, which has enormous scientific and practical significance for the right way to gather information through interview conducting. Training is the only thing that derives very strict differences when it comes to approaches in interviewing and the right relation to the interviewees with taking into mind all differences and possible approaches in engagement with them. The very important part of the training is that it represents a safe area where mistakes are allowed and do not represent real hurts and result in making victims or providing second victimisation by sole institutions (and their representatives) that are meant and should serve to protect them.

Principle 5. of accountability provides aspect for the institutions which should be transparent in the approach and should serve all citizen equally, with very same approach to everyone. One of the main purpose of the founding of the CPT Committee for Prevention of Torture and Inhuman or Degrading Treatment or Punishment is to promote excellence in treating suspects and detainees by Law enforcement agencies (LEAs). Reports and the mechanisms of the implementation and furthering of the implementation of the Convention serve as regulating points for the members of the Convention.

STATE OF THINGS IN SERBIA

It can be seen from the reports of the CPT in past seven years and visits made throughout those years, that it is not the existing case in Serbia. Generally, there have been 7 visits since the ratification of the Convention of which there were 5 periodic (2004, 2007, 20111, 2015, 2021) and 2 ad hoc visits (2017 and 2023 - CPT Report following the visit in 2017, 2021, 2023). In the reports from the periodic and ad hoc visits especially in the last seven years there are some significant points that should be considered very carefully. When comparing reports and responses of the Government of Republic of Serbia (CPT Report following the visit in 2017-2023 and Serbian Government answers) there are numerous points that can be derived from it. Reports are always providing facts that are related multi folded to Law enforcement agencies, prison facilities, psychiatric institution and Social care Institution and within there are mentioning of the found issues and facts. Within our article we were interested specifically in Law Enforcement agencies and ill-treatment of suspects and in comparison, of those we can see the situation in the Republic of Serbia.

In 2021 CPT has done regular periodic visit and found the following regarding LEAs: Stressed the fact that very little has been done by LEAs position after the visit in 2017, and that is a very significant statement. In this report and visit 80 detainees had been interviewed and found well documented by pictures and documentation 11 cases of ill-treatment done by Police and all explicitly mentioned in the report, where it was stressed out as: "received a significant number of credible and consistent allegations of torture and other forms of ill-treatment of detained persons by police officers. The alleged ill-treatment consisted of slaps, punches, kicks and truncheon blows as well as the application of electro-shocks by hand-held devices and electric cables connected to a car battery and placing persons in stress positions during interrogations". CPT has proposed various measures in solving previously found problems and some of those were: "the CPT recommends that a series of more resolute measures be adopted including: a formal statement at the highest political level on zero tolerance towards police misconduct; targeted training activities on issues such as the practical aspects of the prevention of ill-treatment; and the introduction of an investigative interviewing approach of criminal suspects. In addition, a more stringent oversight of the modus operandi of police inspectors of the Belgrade anti-narcotic police department is imperative. The mandatory audio and video recording of all police interviews should also be introduced." Also, there was stated: **"Furthermore, the CPT is particularly concerned by the lack of effective action to implement its recommendations as regards combatting ill-treatment by police officers. This requires that the various preventive measures adopted are both strengthened and implemented in practice, and that investigations into allegations of ill-treatment by police officers of persons apprehended and detained are carried out effectively. There is also a need to accelerate the implementation of the nascent reforms regarding the treatment of persons held in remand detention. As regards Articles 3 and 10, paragraph 2, of the Convention, the CPT trusts that the Serbian authorities will take concrete measures to address the long-standing issues referred to above"**

One very important aspect of the investigation and its impact on the wider public perception of the Police activity and real results of it is how the ill-treatment is tackled and how quick reactions are by the whole society. In that area very disappointing is perception of the CPT, which is the reality in our surrounding: "The effectiveness of investigations carried out into allegations of police ill-treatment was examined to ascertain the progress made since the CPT's 2017 visit. An analysis of numerous investigative files revealed that in too many instances, prosecutorial investigations into possible violations of Articles 136 and 137 of the Criminal Code failed to comply with the criteria of effectiveness as set out in the Methodology on the Investigation of Cases of Ill-Treatment adopted by the Serbian authorities in 2018. The CPT considers that Articles 136 and 137 of the Criminal Code should be amended in line with Article 1 of the United Nations Convention against Torture. Further, the CPT recommends that prosecutors and police oversight mechanisms, when carrying out investigations into cases of alleged ill-treatment be more thorough, comprehensive, and expeditious. All prosecutors and investigators should be trained on the Methodology on the Investigation of Cases of Ill-Treatment. The CPT also raises concerns over the leniency of sentences imposed by courts on police officers convicted of ill-treatment."

Also, we can see that access to the lawyer and medical examinations are at stake in our practice, where: "action is required to guarantee the right of access to a lawyer as from the very outset of detention and for detained persons to speak in private with their lawyer. Steps should also be taken to ensure that medical examinations are always conducted out of the hearing of police officers, visible injuries observed on detained persons accurately recorded in the relevant minutes on detention and that all persons are fully informed of their rights as from the very outset of their deprivation of liberty. Furthermore, custody records should be diligently filled out and a code of conduct on interviews by the police adopted, together with stricter reporting requirements on the use of means of coercion by po-

lice officers." This means that our records are to be also very much revised and changed between the Ministry of Interior and Ministry of Justice - MoJ (since that is the jurisdiction of the MoJs Directory of penalties enforcement) and that should be done by higher authority with monitoring by public prosecutor's office and Courts. Nevertheless, CPT provides some kind of homage to activities in the detention policies and following facilities and human factor accompanying it. It was stated in the report of 2023: "The CPT notes positively the improvements in the conditions of the detention facilities, notably in the Belgrade area, and the rolling plan for refurbishment of all police custody areas."

The public answer to the visit in 2021 by the Serbian government included activities of the National prevention mechanism (NPM) in "visiting 48 police stations, out of a total of 85 visits to institutions where persons deprived of their liberty are or may be found in 2017, and in 2021 33 police stations of 85 in total". This is because of the activities the NPN has been monitoring: "activities related to monitoring the exercise of basic rights of apprehended and detained persons - the right to access to a doctor and a lawyer, the right to inform a third person about their detention and the manner in which the apprehended and detained persons are informed about their rights". Also, there have been listed many activities in the line to provide change in the area like projects[12], programs[13] trainings (mainly PEACE method of interviewing, but in 2020 and some in 2021 in total 1270 police officers were trained), theoretical lesson deliveries and examines. And as commented in the interview those were very palliative and not productive or could not anyway present the drive for a change.

CFP Report 2021 says "**the adoption in 2019 of the Rulebook on Police Powers (RPP), 11 the development of specific training modules for police officers and judicial authorities on torture prevention and accountability including on the enhancement of interviewing skills, 12 the reinstatement of the five-member Commission for the Prevention of Ill-treatment and Torture by police staff as an internal oversight body of the Ministry of Interior, 13 and the training of health-care staff in prisons on the recording of injuries as set out in the Istanbul Protocol. Further, a general refurbishment plan of police detention facilities had been initiated in 2018 (see paragraph 43).**" (CFP Report 2021)

The report 2023 **concludes in the overall, that the treatment of persons deprived of their liberty by the police, particularly in the Belgrade area, has not improved since the 2017 and 2021 visits.** The principle of cooperation between Parties to the Convention and the Committee, as set out in Article 3 of the Convention, is not limited to facilitating the work of a visiting delegation. It also requires that decisive action is taken to ensure that recommendations made by the Committee are effectively implemented in practice. **In this regard, the CPT notes that the Serbian authorities have not taken effective action to combat ill-treatment by police officers since the Committee's previous visits in 2017 and 2021.** Decisive steps are required to put in place measures aimed at preventing the recourse to ill-treatment by police officers and ensuring that investigations into allegations of ill-treatment by police officers of persons deprived of their liberty are carried out effectively. There is also a need to implement the longstanding recommendations in the field of prison healthcare and to promote a radical change as regards the regime offered to remand prisoners. **The CPT considers that a continued lack of action by the Serbian authorities to address these matters may result in the Committee opening the procedure laid out under Article 10, paragraph 2, of the Convention.**

12 Strengthening the protection of human rights of persons deprived of their liberty and convicted persons in Serbia - phase 2", the Police Directorate, together with the Commission for the Implementation of Standards of Police Treatment in the Field of Prevention of Torture, a Working Group was established for drafting of the Manual on conducting informative interviews with the categories of suspects, injured parties, witnesses and persons with mental disabilities and the Working Group for the introduction of the "custody officer""

13 Program of Professional Development of Police Officers of the Ministry of the Interior

For example, Serbian Government answered to the CPT Report following the visit in 2021, 2023. But those answers were listing processing and following activities of procedural agencies of some of those appeals and torture alleged treatment, and regular activities within the cooperation between LEAs, and their training, but as already stated by CPT, not in real change in the stand and procedural position of LEAs. For instance, the answer was provided in the 2023 report: "In accordance with the Professional Development Programme for Police Officers of the Ministry of the Interior for 2023 – 01 number 15-236/23-1 – dated 9 May 2023, as part of the mandatory instruction in the area "Theoretical Instruction", the topic "Commission for the Implementation of Standards of Police Treatment in the Field of Torture Prevention" was held, which was attended by 28,336 police officers during 2023. Within the framework of additional trainings, which are also implemented through seminars, the programme includes also a seminar called "PEACE" - a model for conducting an official interview, which can be organised and implemented independently by separate organisational units, in accordance with their own training needs. Also, within the Council of Europe project "Enhancing the human rights protection for detained and sentenced persons in Serbia - phase 2", a working group of the Ministry was established with the task of creating a Manual for police officers, with the working title "Interviewing in the pre-investigation procedure". For the purposes of creating the manual, the project leader hired two professors from the University of Criminal investigation and Police Studies as experts in this field, while the working group also includes representatives of the Criminal Police Directorate, the Administration for Police Training, as well as representatives of the Commission for the Implementation of Standards of Police Treatment in the Field of Torture Prevention".

CONCLUSION

The results are present in all mentioned points but those are without structural system to be checked in and processed. The main conclusion is that this kind of treatment is very limited in results, and specially in possible results verifying and testing – without linking and providing feedback and missing of circle of learning and circle of change to the knowledge, approach and stand of the LEAs. One of very clear examples is the specific referencing in the 2021 Serbia Report of the CPT (page 19, footnote 21) for the change of approach to the police questioning in direct implementation of Mendez principles. The result was not in engagement of the UCIPS (since there is a Cost action project (CA22128) where two of professors from UCIPS are engaged and can provide training and links with all experts involved in the project) but in listing trainings and roundtables that were ongoing without any reference to similar change or readiness to change in this area. All things considered in the presented article can lead to various conclusions already derived and stressed out by CPT alone. Therefore, Serbian MOI, Public prosecutor's office, and Ministry of Justice (and in the end the Government of Republic of Serbia) are not determined directly in providing strict answer to processes that have been identified by CPT in the long term directed findings throughout visits mandated by Convention. Their determination is not shown even in declaration of zero tolerance towards torture and ill-treatment of detainees and suspects, let alone in determined stand to change of LEAs approach and position in the criminal procedure activities (including pre-trial procedures and activities). Instead of that in the publicised answers (to the CPT – which is approved to be publicised by Serbian government) it is very often providing the elaboration of the LEAs position and sharing the burden of accountability for treatment of citizen and not the procedural powers within Serbian law system. That is a way of blurring and dispersing of reasons for change rather than taking thorough revision and deep change of the system which is not providing the right results. This kind of state strategy in dealing with structural, strategical and very vital area is not promising in any way. Also, in the recommendation of mandatory recording of the procedure of questioning it is stated that there is a necessity to have it as a procedurally mandated ac-

tion. It is not understood as such, and when one digs deeper, in situations stipulated by Criminal procedure Code (CPC) art. 236 of the CPC which proscribes mandatory recording of the interrogation for the criminal acts from art.162. of CPC, although there were installed equipment and functional devices, there are no existing recordings in this procedure. That depicts the whole situation in the area. In summary there are and there were some downsides registered within the existing system in Republic of Serbia, and they were pointed out as shown in the article by the mechanisms created by CPT and within the obligations under the conventions by Republic of Serbia. These were created to monitor and advise members of the Conventions whether they are complying to the standards created. In this line from the 2017 there were no movements forward by Serbia and that was noted, and stressed out, but still nothing is happening. It can be inferred from that that shown principles could be the real solution, and that the philosophy behind those principles is real salvation for the system in Serbia. Therefore, there should be done structural changes in the system which will provide more powers in the Police and Public prosecutor's office accompanied with mandatory recording of the process of police and prosecutors questioning of the citizen and suspects with all safeguards principles provide. That means that there should not be any kind of tolerance – there should be zero tolerance about any coercive questioning (police or prosecutors) and it must be systematically and very determinately declared and implemented by public authorities. This is very important to be stated declaratively and determinatively with very firm stand by each state agency. Only in this way can we provide more secure and more real safeguards for the wider public in law enforcement of the rights and liberties in our society. This is something to strive for and authors of this article are determined to act in that way and channel the efforts in this direction, and this article is seen as such activity and striving.

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THE PERCEPTION OF THE SCHOOL POLICE OFFICER REGARDING THEIR RELATIONSHIPS WITH OTHER ENTITIES IN THE SCHOOL

Bojan Janković, PhD[1]
Saša Milojević, PhD
Boban Milojković, PhD
Srđan Milašinović, PhD
University of Criminal Investigation and Police Studies, Belgrade, Serbia

INTRODUCTION

Despite the increased number of scientific studies that indicate that the presence of the police does not affect the reduction of crime in schools, the opposite is happening in the field, which is reflected in the increased presence of the police in schools (Fisher, McKenna, Higgins, Maguire, & Homer, 2022; Milojević, Janković, Milojković, & Djukanović, 2017; Montes et al., 2021). School policing in the USA is one of the fastest growing areas of policing (Scheuermann, Billingsley, Dede-Bamfo, Martinez-Prather, & White, 2021). The media certainly contributed to such a situation by publishing sensational headlines, which contribute to the creation of the public's belief that violence in schools is widespread and that it happens every day. (Brown, 2006).

The public in Serbia is probably of the same opinion after the mass shooting that took place on May 3, 2023 in the "Vladislav Ribnikar" elementary school in Belgrade, in which eight children and a security guard were killed, while six children and one school teacher were wounded (Janković et al., 2023). This was the first mass shooting in Serbian schools, and the fact that the perpetrator of this massacre was a thirteen-year-old student caused an even greater shock.

Greater police presence in Serbian schools was first noted in 2002 when the "School Police officer" program was launched, when 185 school police officers were hired (Bošković & Simić, 2004). Until the aforementioned mass shooting, 381 school police officers were deployed in schools in Serbia (Kekić & Spasić, 2018), but not in all schools. Some of them were in charge of several schools, and some visited certain schools only occasionally, which was also the case with the school where the mass shooting took place. After the mentioned event, 3,448 police officers are currently taking care of security in Serbian schools (Janković et al., 2023).

From the above, it can be concluded that the public, both at the global level and in Serbia, is of the opinion that the presence of the police in schools is necessary. However, it would be interesting to hear the other party – police officers in schools. Good interpersonal relations are a prerequisite for doing any job. The aim of this research was to determine whether school police officers are accepted in the environment where they work, whether they have a good relationship with employees, parents and children, whether they themselves consider that they are needed in the said environment, as well as whether their presence has increased safety in schools. School safety is not only the sole responsibility of the police, but must be based on the principle of partnership between the police and schools (Fisher

1 bojan.jankovic@kpu.edurs

et al., 2022). To make that partnership successful, it is also necessary for the students to be informed about all safety incidents that may occur at school and how to behave when they happen (Cvetković et al., 2016; Đurđević et al., 2019; Milojević et al., 2019; Milojević et al., 2017).

LITERATURE REVIEW

When the topic of police presence in schools is discussed in literature, it is viewed from several angles. The first topic to be considered is the role and tasks of the police in schools. In the USA, school-based police officers engage in law enforcement, education, and mentoring (the triad model), at which they are mostly dedicated to law enforcement (Brown, 2006; Gill et al., 2016; Ryan et al., 2017), and the least to education (Ivey, 2012). Fisher et al. (2022) state in their research that in practice it has been observed that the three roles are often opposed to each other. Therefore, as a solution, they propose the concept of police work in the community, which can offer a perspective in overcoming the mentioned opposites. This study indicates that the mentioned concept, with its three dimensions (community partnerships, problem-solving, and organizational adaptation), can be a strong model for organizing police work in schools. Unlike the USA, in Serbia school police officers are exclusively dedicated to law enforcement (Janković et al., 2023; Milojević et al., 2017).

Another topic that is more extensively discussed in literature is whether the presence of the police in schools affects the reduction of crime in them, that is, whether the presence of the police in schools is effective or not. The largest number of studies indicate that the presence of police officers in schools does not affect the reduction of crime in schools (Fisher et al., 2022), while some studies indicate that since the introduction of the police in schools there has even been an increase in criminal offenses (Gottfredson et al., 2020; Jennings et al., 2011; Stevenson, 2011). A smaller number of studies have found that the presence of police in schools has positive effects, in terms of reducing the fear of crime and increasing the safety of students while at school (Chrusciel et al., 2015; Milojević et al., 2017; Spasić & Kekić, 2012).

The training of police officers for working in schools is a topic that has recently been very prominent in literature, because it has been noticed that police officers are not well prepared to work in them. Despite being in constant contact with adolescents, surprisingly, most police officers receive minimal training on how to understand and communicate with adolescents (Counts et al., 2018; Fix et al., 2021). Training that focuses on providing police officers with better understanding of the developmental characteristics of children and youth can reduce instances where they overuse intense or harsh responses to typical behaviour of children and youth, especially those with developmental disabilities (Scheuermann et al., 2021). The role of the police in schools is changing, and therefore the education and training of police officers should be adapted in order to improve various skills, which are not only required for law enforcement, but also for new roles of police officers (Trotman & Thomas, 2016). Even more worrying is the fact that police officers in schools do not receive any form of specialized training for working in schools, as is the case in Serbia (Janković et al., 2023; Milojević et al., 2017), or Texas (Martinez-Prather et al., 2016).

A group of studies examines the perception of employees, children, parents and police officers about policing in schools. Typical studies on school policing tend to point to their positive impact on participants' perceptions of the effectiveness of such programs, rather than studying objective records (James & McCallion, 2013). For example, Theriot (2016) indicated that students who had a greater number of interactions (five or more) with police officers in schools had more positive attitudes about them than students with fewer interactions. A number of studies have indicated that school employees,

principals and teachers have a positive opinion of the presence of the police in schools, believing that their presence deters students from bad behaviour and contributes to reducing crime (Chrusciel et al., 2015; Kekić & Spasić, 2018; Öğülmüş, & Kumandaş, 2011; Spasić & Kekić, 2012; Wolfe et al., 2017). In the research conducted in Serbia by Janković et al. (2023), 8,617 respondents took part, who expressed their views on the role and effectiveness of police work in schools. In general, all respondents, school employees, police officers, parents and children, had a positive attitude towards the work of police officers in schools.

METHOD

The results presented in this paper are part of a larger study (Janković et al., 2023) that was conducted in the period September 2021 – June 2022. The research used batteries of online questionnaires for seven categories of respondents: students, parents, teaching staff, principals, professional associates, teams for protection against violence and a questionnaire for police officers. 8,167 respondents were included in all surveys. In this paper, only the results from the questionnaire for school police officers are presented. The questionnaire for police officers included 308 school police officers. The socio-economic and demographic characteristics of the respondents are shown in Table 1.

Table 1. *Basic Socio-Economic and Demographic Information about Police Officers*

Variable	**Category**	**Frequency (%)**
Gender	Male	218 (70.6)
	Female	90 (29.1)
Age	≥25	22 (7.1)
	26-35	78 (25.2)
	36-45	99 (32)
	46-55	109 (35.3)
Education	High school	249 (80.6)
	College	27 (8.7)
	University	32 (10.4)
Years of work experience	Up to 2 years	13 (4.2)
	Up to 10 years	12 (3.9)
	Up to 20 years	94 (30.4)
	Up to 30 years	83 (26.9)
	Up to 40 years	12 (3.9)
Years of work experience as a school police officer	Up to 1 year	25 (8.1)
	Up to 2 years	37 (12)
	Up to 10 years	14 (4.5)
	Up to 20 years	65 (21)

Type of school	Elementary	2225 (96)
	High	91 (3.9)
The length of presence of the school police officer in your school	Up to 5 years	62 (7.52)
	6-10 years	212 (25.7)
	11-15	228 (27.6)
	Over 16 years	323 (39.15)
Perception of how they feel in school	1	18 (0.8)
	2	10 (0.4)
	3	468 (20.2)
	4	40 (1.7)
	5	1752 (75.6)
Number of students in school	Up to 50	144 (6.2)
	51-200	549 (23.7)
	201-500	706 (30.5)
	501-1000	735 (31.7)
	Over 1000	182 (7.9)
The presence of the school police officer in the school	Yes	849 (38.7)
	No	1299 (59.2)

In preparing the questionnaire for this study, several studies were considered (Chrusciel et al., 2015; May, Rice, & Minor, 2012; Milojević et al., 2017; T. Rhodes, 2019; Theriot, 2016; Wolfe et al., 2017), and the questionnaires were carefully prepared for online use. After conducting an online survey, using the Survey Monkey software solution, the obtained data were statistically processed. An initial invitation to participate in the online survey was made on social media, and participants were selected using a convenience sampling strategy.

RESULTS

In order to determine the quality of the relationship between the school police officers and other subjects in school, the police officers were asked questions related to the quality of the information received by the school administration. The first question was about whether the schools made them familiar with their procedures and the ways to act in order to achieve the security protection of students and schools. Most school police officers, specifically about 89.6%, reported that the schools made them familiar with the mentioned procedures, whereas 7.8% of the respondents indicated that they were not informed. The next question was about whether schools notified them about incidents that had happened at school in their absence. The majority of respondents, approximately 73.8%, reported that schools provided notifications and additionally submitted reports to the relevant police stations. A smaller number of respondents (16.8%) declared that they informed only them, and 6.8% declared that they were not aware of other security incidents. Since in other countries police officers

in schools, in addition to security tasks, are often involved in teaching, the authors were interested in whether they are also involved in some other school activities. In accordance with the above, the authors were interested in whether school police officers know exactly what their tasks are. While 79% of respondents stated that the school police officer's goals and tasks were clearly planned, 12% said they were not clearly defined. The majority of respondents, 84.1%, felt they had adequate time to finish their tasks, whereas 10.7% said they did not have enough time. The next question was about whether they were involved in other school activities, at the request of the principal, employees or parents and children. About 42.7% of respondents declared that they participated in such activities, 45.6% of respondents declared that there were no such requests, and 8.7% of school police officers stated that there were such requests, but that they did not accept participation in them because they were not in the description of their tasks. The following questions were asked to the respondents in order to determine the perception of school police officers about their relationship with principals, children, parents and employees. School police officers mostly rated their relationship as excellent or very good, with employees – 89.6% of respondents, with principals – 85.8% of respondents, with parents and children – 82.9% of respondents. A large number of respondents (84.8%) were satisfied with the attitude that the school staff had towards them and that they had no suggestion for improving cooperation between them and the school staff. As many as 83.2% of the respondents believed that their involvement improved safety in the school they were deployed at. The above results are shown in Table 2.

Table 2. *Perception of school police officers on relationship with other subjects*

Variable	**Category**	**Frequency (%)**
The school made me familiar with its procedures and the ways to act in order to achieve security protection of students and the school.	Yes	277 (89.6)
	No	24 (7.8)
The school notifies me on security incidents that happen in my absence.	Yes, but the school also submits a report to the police station when necessary.	228 (73.8)
	Yes, they inform only me.	52 (16.8)
	No, I have not been informed that there had been other security incidents.	21 (6.8)
There are clearly planned goals and tasks of the school police officer.	Yes	244 (79.0)
	No	37 (12.0)
	I do not know	20 (6.5)
I have enough time to finish all predefined tasks.	Yes	260 (84.1)
	No	33 (10.7)
	I do not know	8 (2.6)

I am also involved in other activities that are not a part of my tasks at the request of the principal, school staff or parents and children.	Yes	132 (42.7)
	No, there were not such requests.	141 (45.6)
	No, I haven't accepted other activities because they were not in the descriptions of my tasks.	27 (8.7)
The assessment of the relationship with the principal / principals of schools.	1	1 (0.3)
	2	4 (1.3)
	3	31 (10.0)
	4	66 (21.4)
	5	199 (64.4)
The assessment of the relationship with children and parents in schools I am assigned to.	1	-
	2	3 (1.0)
	3	42 (13.6)
	4	96 (31.1)
	5	160 (51.8)
The assessment of the relationship with employees in the school / schools I am assigned to.	1	-
	2	2 (0.6)
	3	21 (6.8)
	4	76 (24.6)
	5	201 (65.0)
Suggestions for improvement of cooperation with the school staff (principal, employees, parents, students)?	Yes	10 (3.2)
	I do not believe that the cooperation could be improved.	28 (9.1)
	No, I am satisfied with the relationship between me and the school staff.	262 (84.8)
My engagement has contributed to the improvement of security in the school.	Yes	257 (83.2)
	No	7 (2.3)
	I do not know	31 (10.0)

DISCUSSION

A prerequisite for the quality performance of school police officers is their good cooperation and good relationship with other subjects in the school. The first indicator of whether the cooperation is good is

if the schools exchange data with the school police about the security measures they take in school and about the security incidents that happen there. For both groups of data, most of school police officers declared that schools delivered the said information to them.

The second group of questions related to the tasks performed by school police officers. Unlike School Resource Officers in the USA, who have a triple role determined through the "triad model" (law enforcement, education and mentoring), the role of a school police officer in Serbia is exclusively law enforcement (Milojević et al., 2017). In the USA research (Fisher et al., 2022; T. Rhodes, 2019; T. N. Rhodes, 2015), it was indicated that the tasks of police officers in schools are not clearly defined within the aforementioned roles. Unless tasks are clearly defined, one of the consequences is that individuals, who perceive their work tasks as unclear or conflicting, report lower levels of job satisfaction (T. N. Rhodes, 2015; Tubre & Collins, 2000), which leads to further reduction of the quality of completed tasks. School police officers in Serbia, in the survey, largely stated that their goals and tasks are clearly planned, which can be the first step towards better performance of their duties. The fact that the tasks are clear indicates that the vast majority of respondents declared that they have enough time to complete the set tasks. Although school police officers stated in the previous answers that the tasks were clearly defined, almost equal number of them stated that they are involved, or are not involved in other activities that are not part of their work tasks, at the request of the principal, employees or parents and children. In other studies, as well (Fisher et al., 2022), it was observed that police officers in schools participate in various activities, which do not fall into the category of law enforcement. It is obvious that in Serbia there is no document (Janković et al., 2023) which defines the duties and tasks of a school police officer in the entire territory of Serbia, but they are defined individually, by managers in police stations. When defining tasks, the specifics of a particular school should be considered, but since the Ministry of Interior (MoI) of the Republic of Serbia is responsible for the security of the entire territory of Serbia, there should be a document that defines the role, goals, and general tasks that apply to every school police officer. Such a document does not exist at present. If there is no such document, a situation may arise, as Fisher et al. stated in their research (2022), that school police officers may believe that school safety solely depends on their ability, and even to state this: "My boundaries are ultimately determined by me".

Respondents were asked a number of questions to determine the perception of school police officers about their relationship with principals, employees, children and parents. School police officers mostly rated their relationship with employees as excellent or very good – 89.6% of respondents, with principals – 85.8% of respondents, with parents and children – 82.9% of respondents. The said results are somewhat weaker than in Canada, for example, where police officers in schools declared that their relationship with students, staff and school administration was excellent or very good (95%, 94% and 95%, respectively) (Toronto, 2009). Although the results in Serbia are at a high level, the results from Canada indicate that there is room for improving the relationship between school police officers and other entities in school, which is something that should be worked on.

In a study in the USA (Chrusciel et al., 2015), as many as 99% of police officers engaged in schools declared that their engagement improved school safety. The vast majority of school police officers expressed a positive attitude on this issue in Serbia as well, but the percentage is smaller than in the USA. This difference can be explained by two facts. The first is that the presence of police officers in the USA schools has been much longer than in Serbia, they have been present in some areas since 1939 (Brown, 2006), that is, the presence of police officers has a long tradition. Another fact is that in Serbia school police officers are more focused on preventive work (Milojević et al., 2017), which is less visible, in contrast to the USA, where they are more focused on repressive work, which is more visible. Repressive work is particularly evident in the USA, because the crime rate is much higher than in Ser-

bia (Crawford & Burns, 2016; Katsiyannis et al., 2018; Stevanović & Zečević, 2020), therefore the presence of the police in schools is also far more necessary than in Serbia. Almost the same results as in Serbia were found in Turkey (Serbia 82.18 – Turkey 83.2%), because, as in Serbia, there is no tradition of police work in schools, and the crime rate is much lower than in the USA (Öğülmüş et al., 2011).

CONCLUSION

Based on the presented results, it can be concluded that the school police program is accepted in Serbia, both by the school police officers themselves, and by school employees, parents and children. School police officers have become an integral part of the school environment. However, after the mass shooting at a school in Belgrade, school police officers were implemented in all schools in Serbia. The question arises whether they should be in every school, or in those schools which, after a risk analysis, are determined to be there?

One of the problems that has been observed and which can be a "stumbling block" is that the tasks of school police officers are not clearly defined, and sometimes there can be a misunderstanding between school police officers and employees about what the police officers should do. The Ministry of the Interior should draft a single act (rule book, regulation) that will clearly define the work of school police officers: the selection of school police officers, their tasks, training, criteria for selecting the schools where they should work, and the like.

In order to improve the relationship between the MoI and schools, that is, school police officers and school employees, a memorandum of understanding should be drawn up, which should be jointly signed by police representatives and school principals. It would be drawn up on the basis of the aforementioned act previously drawn up by the MoI, and this would be a legal agreement that would define the roles and responsibilities of school police officers.

Adequate training of school police officers, which currently does not exist, would certainly help them improve the quality of relations between school police officers and other entities in the school. In planning future trainings, it should be considered that the training of school police officers is not traditional police training, focused only on law enforcement, but also on the implementation of tasks in a specific environment. In school institutions, it is equally important, on the one hand, to build good relations between school police officers and the school staff, and on the other hand, to monitor school safety.

It should be noted that this research was done before the mass shooting at the school in Belgrade. A new research should be done in order to determine what the situation is like now, after the mass shooting. Certainly, this research is the basis for similar future studies.

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CERTAIN ASPECTS OF POLICE WORK IN COUNTERING IRREGULAR MIGRATION AND PEOPLE SMUGGLING

Saša Marković, PhD[1]
University of Criminal Investigation and Police Studies, Belgrade, Serbia

INTRODUCTION

Countering cross-border crime and irregular migrations is one of the areas of work for the border police. Irregular migrations can be defined as any movement of the population from one country to another that is not in accordance with the applicable legal regulations of the country of origin and the country of destination (Dostić, 2022). Within the Directorate of Border Police, a department with four sections has been established that, among other things, deals with this type of police work. They also gain importance at the regional level because Serbia borders four EU countries, two of which are in the Schengen area (Hungary and Croatia), and the territory of Serbia is located on major smuggling routes from Asia to Western and Central Europe. The issue of irregular migrations is also influenced by the decisions of EU countries and those along the migration route. In this regard, the different approaches of EU member states to irregular migrations, or the lack of a unified migration policy, directly affect the state of migration and, consequently, the situation in individual countries along the migration route (Bergesio, Bialasiewicz, 2023; Koroutchev, Peev, 2022; Ilievski, Tasev, 2019). Hungary is the first country in the region to implement comprehensive legal and technical measures to prevent irregular migrations across its state border. It has erected physical barriers on the external borders of the Schengen area, implemented adequate legal measures, and tightened criminal legislation in the field of migrant smuggling (Böröcz, 2021). In 2015, the Hungarian government issued a decree declaring Serbia a safe third country. According to this decree, if asylum-seeking migrants are found on Hungarian soil after entering from Serbia, and their asylum request is denied, they can be deported back to the country from which they entered. From available public sources, it can be concluded that in 2022 alone and the first 10 months of 2023, over 250,000 migrants were returned to Serbia from Hungary through transit gates. In 2019, the European Court of Human Rights ruled that Hungary had violated human rights as established by Article 3 – prohibition of torture – of the European Convention on Human Rights but did not violate Article 5 of the same convention - right to liberty and security. The court noted that before returning the two migrants, Hungary did not assess whether the asylum seekers would have access to appropriate asylum procedures if returned to Serbia and whether Serbia would respect the principle of non-refoulement, considering that they could freely return to a third country from which they came without any threat to their life or health (Case of Ilias and Ahmed v. Hungary App. no. 47287/15).

In Serbia, the legislative penal policy has also been tightened. For migrant smuggling, the prescribed prison sentence is from 1 to 8 years, and if the crime is committed by a criminal group, the sentence is from 2 to 12 years, or if by an organized criminal group (OCG), from 3 to 15 years (Criminal Code, Article 350, paragraphs 3 and 4). A decision has been made to erect physical barriers along parts of the border with Bulgaria and North Macedonia. The border police primarily direct their activities in coun-

1 sasamarkovic975@gmail.com

tering cross-border crime towards suppressing crimes related to human smuggling, illegal drug trafficking, and arms trafficking. However, since the border police are not responsible for investigating and proving these crimes, after identifying the perpetrator and taking them into custody, they hand over the case to the criminal police for further investigation and jurisdiction. The competent public prosecutor is informed and directs further actions to secure evidence for filing charges. A significant part of the border police's activities also involves gathering and sharing intelligence in these areas, and it is unimaginable to combat cross-border crime without the participation of the border police (Marković, 2023a). Following the events that occurred in late October 2023 in Horgos, near the Serbian-Hungarian border, where an armed conflict between two groups of irregular migrants resulted in the deaths of three Afghan nationals, one injury, and the arrest of four Afghan nationals and two Turkish nationals, and when the police search of the area and surrounding woods uncovered two automatic rifles with dozens of rounds of ammunition, the Serbian police changed their strategy for countering irregular migrations. A forward command post was established in Subotica, with several hundred members of various police organizational units (Gendarmerie, Special Anti-Terrorist Unit, border police, traffic police, criminal police, general jurisdiction police, etc.) deployed in the area. With the extensive use of drones for monitoring the state border, irregular migrations have almost been stopped.

The purpose of this paper is to present the new strategic approach of the Serbian border police in countering irregular migration and human smuggling.

ORGANIZATION AND OPERATIONS OF THE BORDER POLICE

From 2005 to 2007, the Serbian police completely took over border control from the military, after which civil protection of state border security was implemented. Since the implementation of the Police Law in 2005, the adoption of a new organization, and the formation of the Police Directorate in 2006, the Border Police Directorate has functioned as a unique and centralized organizational unit of the Police Directorate at the headquarters, hierarchically organized at the central, regional, and local levels. *The Police Law* (2016), like the previous one, defines the organization of the Police Directorate, determining the organizational units at the headquarters and outside the headquarters. Despite the fact that the Border Police Directorate is at the headquarters, unlike the Police Directorate and the Traffic Police Directorate, it is organized at the regional and local levels, in a similar way to the Police Directorate. Instead of regional police departments and police stations, centers and stations were formed. At the central level, 5 departments and the Office for Asylum were established, at the regional level, 8 regional centers, and at the local level, 40 border police stations. The entire organization is managed in a pyramidal system from a single point, by the head of the Directorate (Marković, 2023).

The border police perform tasks related to border control, suppression of cross-border crime, movement and stay of foreigners, suppression of irregular migrations, asylum, control of legality in work, and logistics. *The Law on Border Control* stipulates that border control includes the tasks of state border supervision, border checks, and risk analysis of border security threats. The purposes of performing border control are: ensuring state border security; protecting the lives and health of people and the environment; preventing, detecting, and clarifying criminal acts and misdemeanors; preventing irregular migrations; and preventing and detecting other activities and actions that disturb public order and peace, the legal system, and public safety. Border surveillance represents a set of authorities, actions, and measures conducted along the state border, between border crossings, and at border crossings outside of established working hours. Its aim is to combat cross-border crime, prevent illegal border crossings,

protect the border's inviolability, control border authorizations, and take measures, actions, and enforce authorities against persons who have illegally crossed the state border or misused border authorizations.

Border checks include controlling persons and travel documents, vehicles, and items that border police officers perform within the area of the border crossing during its established working hours. Additional border checks can be carried out at a second-line area, i.e., outside the designated place for border checks. The second-line check includes actions that can be performed at a specially designated place at the border crossing, which is not where the border check of all persons is conducted. We distinguish between basic and detailed border checks. A detailed border check is conducted for persons for whom there are grounds for suspicion that they may endanger the security of the state border, public safety, public order, or public health, or that they will misuse their stay in the territory of the Republic of Serbia. For security reasons, a detailed border check can be conducted for all persons crossing the state border. If it is conducted at the second-line check, individuals are informed of the reasons for the check. Among other things, a detailed border check ensures that the person, their vehicle, and the items they carry will not endanger the security of the state border, public order, or public health. It also includes checking data on warnings issued for persons and items in records maintained by relevant state authorities and international organizations, as well as taking actions based on those warnings.

IMPLEMENTATION OF THE POLICE-INTELLIGENCE MODEL IN BORDER POLICE

The Law on Police (Official Gazette of RS, 6/2016) foresees a large number of measures and actions that police officers can use in order to prevent crime (Vuković, 2017, p. 219). Police work often involves encountering unforeseen circumstances that require a quick response (Marković, 2014). In the last two decades, police work in the area of countering cross-border crime has undergone significant changes. The police are a state body that has a repressive role primarily (Marković, Kolarić, 2024). The traditional method of police work, which involves reactive action, from the committed crime to the perpetrator, has long been dominant. The preventive role, often emphasized in theory and highlighted in legal and by-law regulations, has secondary importance because there are no reliable parameters for measuring its success (Marković, Kolarić, 2024). In recent years, a proactive approach has become the standard. The police, by acting against repeat offenders, monitoring hotspots, and overseeing tools and objects made or modified for committing crimes, attempt to prevent the commission of crimes.

Crime investigation strategy, in the broadest sense, implies the operationalization of crime policy concepts of suppressing crime generally or countering certain forms of crime in the national territory or at the regional level by applying the crime countering agents who apply strategic measures (Marković, Kolarić, 2023). The police-intelligence model (intelligence-led policing) is recognized as the leading approach in most European countries. Following the recommendations for its implementation by the European Union in Chapter 24, it was introduced into the work of the Serbian police through the Police Law (2016) (Kolarić, Marković, 2016; Marković, 2016; Marković, 2022). Decisions are made based on criminal intelligence information. Repeat offenders are targeted, and through the analysis of their criminal activities, crimes that have been committed or were intended to be committed are identified (Marković, 2019a). The criminal intelligence cycle is a process of developing and transforming raw information and data into actionable intelligence, which is delivered in a format suitable for use by authorized police officials. It involves the submission of requests, process planning, data collection, processing, analysis, and dissemination of intelligence (Marković, 2019). It begins with identifying the needs of authorized managers in the police organization. Based on these requests, planning and

direction are carried out to effectively manage the entire cycle. The next step is the collection and acquisition of information and data from various sources. This is followed by processing and exploitation, i.e., transforming the vast amount of collected data into a form usable by analysts. The next phase involves the analysis, evaluation, and synthesis of available knowledge to obtain intelligence with the aim of preparing finished criminal intelligence products. Finally, in the dissemination phase, the intelligence products reach the requester who initiated the cycle. Often, "soft" criminal intelligence products, stripped of confidential or operational information, are made available to the public to raise awareness and stimulate resilience against identified criminal threats (a public version of the document is published) (Marković, 2023).

The Head of Border Police Directorate leads the operational management group and is authorized to make decisions. All heads of organizational units directly subordinate to him attend the group meetings, with regional center chiefs most often attending online due to the distance of their workplaces. The Head of Border Police Directorate submits a request to the organizational unit responsible for risk analysis (Department for Integrated Border Management and Risk Analysis) to address a specific security issue.

Risk analysis is a working method used to identify risks and threats based on available information, providing the Head of Border Police Directorate with a basis for decision-making. The analysis of border security risks must rely on the efficient and rapid collection and exchange of all relevant data and information. Threat and risk assessments begin with evaluating the nature and scale of specific threats. It should also measure the likelihood of the threat occurring and the potential harm it could cause (Marković, 2019). The method of conducting risk analysis is defined by the Common Integrated Risk Analysis Model (CIRAM 2.0), a methodology developed by the European Border and Coast Guard Agency – Frontex, and is also a requirement under European legal regulations. Within the organizational unit that handles this type of work, collected data is processed and analyzed to create a final product in a format suitable for decision-making. The data is collected by police officers from all organizational units of the Border Police Directorate, primarily by border police stations established to perform state border surveillance and conduct border checks at border crossings. Police officers enter the collected data in the form of an operational report into the electronic system. In the Serbian police, a system has been established in which, after the submission of an operational report, there is a chain of five levels of decision-making. The first level is the verifier – the authorized immediate supervisor (station commander) who has the right and duty to verify the operational report. He can make three decisions: he can return the report to the submitter for supplementation, reject it as not of security interest, or forward it to a lower administrator (usually the head of criminal analysis). He does not decide who will work on the report. The lower administrator is the second level of decision-making. When he receives the operational report for decision-making, the personal data of the submitter are not available to him, only the data of the organizational unit that submitted the report. The lower administrator – the head of the regional border police center – checks the report through operational databases and can supplement it. He usually decides who will handle the operational report if the case is handled at the regional center level, or he can forward it to a higher supervisor – the Head of Border Police Directorate – to make a decision (Marković, 2019). If it is necessary to assign the case to another organizational unit, the report is forwarded to operational analytics – an organizational unit in the Criminal Police Directorate that will decide to whom the case will be assigned. Exceptionally, in rare situations, complex cases may be referred to the Director of Police for a decision.

After receiving the finished intelligence product, which is created by the risk analysis unit in cooperation with the department responsible for countering cross-border crime (Department for Countering Cross-Border Crime and Irregular Migrations), a decision is made to implement specific operational

tasks. For example, this could include detailed border control of certain freight vehicles at specific border crossings (exit or entry) to combat the smuggling of irregular migrants.

COUNTERING THE SMUGGLING OF IRREGULAR MIGRANTS

In the Strategic Public Safety Assessment for the period 2022–2025, preventing and countering irregular migration is defined as a strategic priority for the Serbian police and is assessed to pose a moderate risk to public safety. The third strategic document in the field of countering organized crime, the Serious and Organized Crime Threat Assessment (SOCTA), was adopted in Serbia in 2023. Human smuggling is identified as one of the areas of crime whose suppression is a strategic priority for the Serbian police. At the time of adopting SOCTA in Serbia, the police had registered 12 organized crime groups (OCGs), with migrant smuggling, along with the illegal trade and smuggling of narcotic drugs and weapons, being one of the most common areas of criminal activity they engage in. High profits and the inability to migrate legally from Asia to Europe have led to an increasing number of organized crime groups (OCGs) engaging in this type of crime. They are hierarchically structured, pyramid-shaped organizations that employ a medium level of leader protection and a high level of internal discipline. They are connected with similar OCGs across Europe, especially those operating in the Western Balkans. Their significant financial power and high level of corruption influence over government officials in the judiciary, customs, tax police, and law enforcement, along with the engagement of top lawyers with strong contacts, the use of encrypted channels and social media platforms, and the anonymity of cryptocurrency transactions, allow them a high degree of protection for their criminal activities and the investment of profits ("laundered money") into legal businesses. The border police are not isolated from this issue, so smuggling is carried out in a certain percentage of cases with the help of "dirty" border police officers. There is a significant danger that among the irregular migrants smuggled by OCGs, terrorists could infiltrate, posing a security challenge for the security services (Janković & Todorović, 2017).

At the beginning of 2018, the tasks of countering human smuggling were transferred from the jurisdiction of the border police to the jurisdiction of the criminal police. This was the only criminal offense in the field of smuggling that the border police independently detected, investigated, and proved. Meanwhile, the tasks of countering irregular migration remained under the jurisdiction of the border police. Considering that these two types of tasks require joint action and the mutual exchange of collected intelligence data, a high level of coordination and cooperation between the border police and the criminal police is necessary to increase work efficiency. It is impossible to imagine mass irregular migrations without the involvement of smugglers. Criminal groups exploit migrants' lack of knowledge of regional conditions and terrain to enable their passage from state to state through illegal smuggling channels for high profit. Therefore, these two areas of police work cannot be carried out separately. Irregular migrations cannot be prevented if human smuggling is not simultaneously addressed. Irregular migrants most often cross state borders on foot, often in larger groups, at locations outside border crossings, avoiding border police officers who monitor the state border. These groups are organized by smugglers, who, for a certain amount of money, provide information about suitable border crossing points, the times when the risk of detection is lowest, and often hire locals to guide migrant groups for a fee (Whittle, Antonopoulos, 2022). The Serbian border police have prevented this method of border crossing in many cases on the borders with Bulgaria and North Macedonia.

In its operations, the border police have established an "early warning" system. An agreement signed between the police, customs, and inspection services, along with a protocol that more closely defines

the exchange of information, regulates the joint creation of risk analyses and the preparation and exchange of early warning information to enhance the efficiency of integrated border management (Marković, 2023). The "early warning" system also operates between the border police of other European countries, ensuring that all security services are promptly informed about newly detected smuggling methods. For example, in recent years, a new modus operandi has been observed, involving the high-risk hiding of illegal migrants in motor vehicles (in the technical space between the engine and the hood). This method is extremely dangerous to the lives of irregular migrants. At the beginning of 2016, within the European Police Office, the Europol Migrant Smuggling Center (EMSC) was established. One of its tasks is to facilitate the exchange of information and early warnings regarding migrant smuggling methods among member states.

In the first half of 2024, the Western Balkan route was almost halted due to the implementation of new police tactics. In Serbia, 108,808 migrants were recorded in reception and asylum centers in 2023, 12 percent less than in 2022, according to the annual report of the Serbian Commissariat for Refugees and Migration published on January 23. The majority of migrants were from Syria and Afghanistan, accounting for 70% of the total, followed by Pakistan and Morocco (The Government of the Republic of Serbia). According to available data for the period of January–February 2024, compared to the same period in 2023, the number of migrants on the Western Balkan route has decreased by approximately 65% (Frontex, 2024). According to data from the Commissariat for Refugees of the Republic of Serbia, a total of 830 irregular migrants were housed in 6 asylum centers and 10 reception centers (KIRS, 2024) in April 2024, which is significantly less than in the period before the establishment of forward command posts. However, in May 2024, there was a 29% increase in the number of migrants, with 1,073 recorded (IOM, 2024).

In the first five months of 2024, a total of 7,261 irregular migrants were recorded, with the majority still being from Syria and Afghanistan, around 55%, which is three and a half times less compared to the previous year. The reception centers used to accommodate migrants are almost empty, and the decreasing trend remains evident on a daily basis. The strategic approach of the police and the implementation of an adequate criminal strategy in this area of police work have yielded excellent results: efficiency, effectiveness, and economy have been achieved. These indicators suggest that irregular migration and smuggling routes have been minimized across the territory of Serbia with the use of minimal material and human resources and the application of modern technical means, primarily drones and thermal imaging (Janković et al., 2024).

Table 1. *Perpetrators of the Criminal Offense of Human Smuggling Under Article 350 of the Criminal Code in the Period 2018–2022.*

Criminal offense	Accused persons	Convicted persons	Prison sentence	House arrest	Probation
Art. 350, para. 2	402	377	123	104	148
Art. 350, para. 3	475	385	207	160	15
Art. 350, para. 4	73	72	71	1	
Total	950	834	401	265	163

The Criminal Code criminalizes the offense of illegal crossing of the state border and human smuggling in Article 350. This offense essentially consists of two independent criminal acts related to the illegal crossing of the state border (Đorđević, Kolarić, 2020: 238). The first pertains to the illegal crossing or attempted crossing of the state border. To commit this form of criminal offense, it is necessary

that the border crossing is illegal and that the perpetrator is armed and/or has used violence. If the second condition is not met, it will be classified as a misdemeanor. The penalty is imprisonment for up to 1 year. In the period from 2018 to 2022, for this form of criminal offense, 34 individuals were charged, and 28 were convicted, with 12 sentenced to imprisonment, 6 to house arrest, 9 to probation, and 1 to a fine. The second criminal offense pertains to human smuggling and consists of three forms. The first form of human smuggling is committed by enabling a person to illegally cross the border of Serbia, to reside illegally, or to transit through Serbia. It is necessary that the perpetrator has the intention to gain some benefit for themselves or another person. In the same period, 402 individuals were charged, and 377 were convicted. The majority were sentenced to probation (39%), followed by imprisonment (33%) and house arrest (28%). Additionally, one individual was given a fine as the main sentence, one was sentenced to community service, and one was found guilty but exempted from punishment. The qualified form of this criminal offense, as defined in paragraph 2, occurs if a larger number of persons are smuggled, if the act is committed by a group, if it involves the abuse of official position, or if it is carried out in a manner that endangers the life or health of the person whose illegal crossing of the Serbian border, stay, or transit through Serbia is facilitated. This more severe form of human smuggling is defined in paragraph 3 of Article 350 of the Criminal Code. During the analyzed period, a total of 475 individuals were charged, and 385 were convicted. Most of the convicted were sentenced to imprisonment, accounting for 54%, followed by house arrest at 42%, and only 4% received probation. Three individuals were sentenced to educational measures. The most severe qualified form is committed when human smuggling is carried out by an organized criminal group, for which a high penalty is prescribed; the perpetrator will be punished with imprisonment from three to fifteen years. For this form of criminal offense, 73 individuals were charged, and 72 were convicted, 71 of whom were sentenced to imprisonment and one to house arrest. As many as 67 perpetrators were sentenced to imprisonment ranging from 2 to 10 years. Of the total 834 convicted individuals, 108, or 13%, were foreign nationals.

CONCLUSION

Irregular migration continues to capture significant attention from the international community. Millions of residents of Asia and Africa have been displaced from the countries where they were born and where their centers of life activities were located. The majority attempt to reach economically developed European countries through smuggling routes in search of better living conditions. The Western Balkan route remains relevant as it is the shortest path from war-torn areas, primarily Syria, to Western Europe. Some of the smuggling routes pass through Serbia. Entry and transit through Serbian territory most often occur via routes crossing the state border with North Macedonia and Bulgaria, with exits across the state border with Hungary and Croatia. Annually, several hundred thousand irregular migrants pass through these smuggling routes. Only a portion stays in reception and asylum centers for a short period until they organize for further travel. In 2023, only 196 asylum requests were submitted in Serbia, 319 in 2022, 172 in 2021, and 145 in 2020 (MUP, 2024). This confirms that Serbia is merely a transit area for irregular migration.

The smuggling of irregular migrants is one of the main criminal activities conducted by criminal groups and organized crime groups. The penalties for this criminal offense are lower compared to drug trafficking, while the profits are high. Our research shows that over five years, 834 individuals were convicted for human smuggling, nearly half of whom received prison sentences, with the combined share of prison and house arrest sentences reaching 80%. In the same period, 72 individuals were convicted of smuggling people as members of an organized criminal group, 71 of whom were

sentenced to prison, with 95% of them receiving sentences of 2 years or longer. A significant number of foreign nationals are also convicted of human smuggling, most of whom are from the countries where irregular migrants originate (Syria, Afghanistan, Pakistan, etc.). The incident that occurred at the end of October 2023, when a confrontation between smuggling groups resulted in the deaths of three Afghan nationals, further confirms that foreign nationals are taking over human smuggling operations through Serbia from domestic criminal groups.

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AN INSIGHT INTO THE PERCEPTION, BEHAVIOR AND IMPACT OF DISINFORMATION IN THE DIGITAL AGE[1]

Krunoslav Antoliš, PhD[2]
University of Applied Sciences in Criminal Investigation and Public Security
Police Academy, Ministry of the Interior of the Republic of Croatia

ADDRESSING THE CHALLENGES OF DISINFORMATION IN THE DIGITAL AGE

In the age of digital information, the proliferation of false news and disinformation poses a significant challenge worldwide. Referred to as "fake news," this phenomenon is not only reminiscent of historical propaganda but also leverages advanced technology to manipulate text, images, and videos (Smith, J. et al., 2020). From fictional content to misleading claims and propaganda, disinformation takes various forms, fueled by actors ranging from bots to clickbait generators.

The emergence of artificial intelligence (AI) further complicates the landscape, with synthetic media capable of creating convincing yet false narratives (Jiman, A., 2022). Recognizing disinformation as a dual problem involving both content manipulation and amplification is crucial, demanding a systematic approach from individuals and institutions alike.

This chapter, drawing from research conducted at the Police Academy, Ministry of the Interior of the Republic of Croatia, offers recommendations for content verification. It underscores the importance of assessing content credibility, verifying sources, and being mindful of personal biases (Police Academy Research, 2023). Moreover, it suggests employing web tools and browser extensions for enhanced verification and protection against disinformation.

False news and disinformation, deliberately altered information aimed at deceiving people, are becoming increasingly widespread global phenomena. The phenomenon of contemporary disinformation, often referred to as "fake news," presents a multifaceted challenge in the digital age. Disinformers today not only invent information and disseminate it, reminiscent of propaganda and disinformation seen in history, but they also leverage advanced information and communication technology to manipulate text, images, and videos (Johnson, L. et al., 2021). Various actors, including bots, troll factories, clickbait generators, fake followers, automated journalism, and data-driven targeted advertising, orchestrate this manipulation with a social aspect, and more and more of it is driven by machine learning and artificial intelligence.

Disinformation encompasses various forms of misleading or unsuitable content used to manipulate perception or convince the public of something that is untrue. The rise of artificial intelligence (AI) opens the door to new forms of disinformation and manipulation. Synthetic media use AI to create, manipulate, and alter data and multimedia to deceive or change the original meaning. There is con-

1 The paper is based on research conducted as part of the Erasmus+ KA220-HED project – Cooperation Partnerships in Higher Education (2022/2025).
2 kantolis@fkz.hr

cern that synthetic media could spread fake news, disinformation, and undermine trust in reality while automating creative processes (Jiman, A., 2022).

Addressing the challenges of disinformation requires a comprehensive and proactive approach. By understanding the various forms of disinformation, leveraging technological tools for verification, and promoting media literacy, individuals and institutions can mitigate the impact of false news and safeguard the integrity of information in the digital age.

THE URGENCY OF RECOGNIZING AND COMBATING DISINFORMATION

Recognizing disinformation as a dual problem involving content manipulation and amplification is crucial, both at the individual and institutional levels. In this context, whether it is journalists, investigators, law enforcement agencies, researchers, educators, or ordinary citizens, a systematic approach is needed to meet the growing demand to combat all types of disinformation, from fabricated and altered content to websites selling fake news and disinformation on digital platforms and social media.

Even digitally educated young people sometimes find it challenging to recognize manipulated news. It is important to note that up to six out of ten news articles shared on social media are not even read by the users who share them. Approximately 85% of Europeans consider "fake news" a problem in their country, while 83% of them believe it poses a threat to democracy as a whole (European Commission, Fake News and Disinformation Online).

Disinformation is particularly dangerous because it is often organized, resource-supported, and technologically driven, with disinformation creators trying to exploit information communication system vulnerabilities and potential supporters to spread their messages. Social media and their personalization tools make it easy to disseminate false stories and disinformation. In many cases, these news stories manipulate emotions to gain attention and generate more clicks, whether for economic or ideological reasons.

It is crucial to recognize how social media and digital platforms play a key role in the spread of disinformation, which subsequently raises legal questions about their regulation. Therefore, self-regulation and increased pressure on them are aimed at improving control and accountability regarding the content they publish.

This chapter, based on research conducted at the Police Academy, Ministry of the Interior of the Republic of Croatia, provides recommendations related to content verification: content, media types, authors, sources, images, including content circulation checks. It also describes and suggests using web tools such as URL scanners, browser extensions, blacklists, and social media tracking tools for platforms like Facebook, TikTok, YouTube, as well as tools for image and video analysis.

A systematic approach is a necessity in addressing the battle against disinformation in the modern age within the digital environment. It allows for a deeper understanding of the complex relationship between social media and disinformation, highlighting how unverified disinformation originating from social platforms can infiltrate mainstream media and influence the broader public discourse.

Ultimately, this work aims to empower experts and institutions responsible for safeguarding one of the most vital values in liberal societies: information. The accuracy and resilience of information directly impact public trust, the quality of public discourse, and the overall health of democracy. Addressing

the issue of disinformation should be viewed as an ongoing battle to protect the integrity of our information and communication infrastructure.

METHODICAL APPROACH TO COMBAT DISINFORMATION

In the fight against misinformation, employing a methodical strategy is essential. Developing a verification checklist that addresses factors such as the credibility of content, verifying dates, and assessing the reliability of sources is paramount in guaranteeing the validity of information prior to dissemination (Guy, T. F. 2024). Furthermore, integrating preventative measures like utilizing virtual machines and VPNs enhances the security of our digital workspace.

Verification Checklist:

- Consider the Source: Click away from the story to investigate the site, its mission, and its contact information.
- Read Beyond: Headlines can be outrageous in an effort to get clicks. What is the whole story?
- Check the Author: Do a quick search on the author. Are they credible? Are they real?
- Supporting Sources: Click on those links. Determine if the information given actually supports the story.
- Check the Date: Reposting old news stories doesn't mean they are relevant to current events.
- Is it a Joke?: If it is too outlandish, it might be satire. Research the site and author to be sure.
- Check Your Biases: Consider if your own beliefs could affect your judgment.
- Ask the Experts: Ask a librarian or consult a fact-checking website.

Only after conducting such preparatory analysis should we consider sharing the article or information.

Preventive Measures for a Secure Working Environment:

- Virtual Machine: Creating a virtual machine as an emulated environment allows us to isolate the virtual computer from the real one, increasing security.
- Computer Cleanup: Regularly cleaning your computer, including clearing browsing history and cookies, helps maintain privacy and anonymity while browsing the internet.
- Virtual Private Network (VPN): Using a VPN protects internet traffic through encryption and hides your IP address, ensuring anonymity and online identity protection.
- Proxy Servers: Proxy servers enable the hiding of user IP addresses, enhancing security and privacy when browsing the internet.
- Secure Web Browsers: Choosing secure web browsers such as Google Chrome, Mozilla Firefox, Microsoft Edge, Safari, and Opera is the first step in ensuring safe internet browsing.
- Browser Extensions: Browser extensions, such as security and privacy-enhancing add-ons, can further enhance computer protection.
- Antivirus Software and Firewalls: Using antivirus programs and firewalls helps protect your computer from cyberattacks and malicious software.
- Connection Testing: It is important to regularly perform connection tests to ensure that important information is not leaking from your computer.

When browsing the internet, various websites and online services may collect information about users, such as their IP address, browser configuration, device details, and other identifying data. This

information can be used for various purposes, including targeted advertising, user tracking, and potentially even identity theft.

To safeguard personal privacy and better understand what information is being exposed while browsing, individuals can utilize online tools like ipleak.net and amiunique.org.

COMPREHENSIVE GUIDE TO ENHANCING CONTENT EVALUATION AND VERIFICATION

In this chapter, we delve into various tools designed for the analysis of video content, encompassing functions such as reverse video search, metadata examination, video downloading, and verification, as well as editing capabilities.

Reverse Video Search: This method and corresponding tools enable users to retrieve information about videos and images from the internet by comparing content with existing sources, facilitating more precise searches. Platforms like Berify and Google's Image Search are well-suited for conducting reverse video searches.

Video Content Analysis (VCA): This process involves the automated analysis of video materials to identify temporal and spatial events. Utilizing video content for analysis allows for performance enhancement by teams or individuals. Analysis can be conducted in real-time, providing valuable insights for a comprehensive understanding of team performance. Tools such as Video Intelligence and SnapWonders facilitate video analysis tasks.

Video Metadata Examination: Video files contain metadata, including details about their recording location, codecs used, video and audio streams, among other information. A metadata viewer enables users to uncover hidden details within video files. Tools like Metadata2Go and FlexClip facilitate the analysis of video metadata.

Video Downloading: Video downloader software enables users to download video content from platforms like YouTube and Facebook. Well-established platforms such as YouTube and Vimeo are typically safe for downloading videos. Tools available on websites like Catchvideo and SmallSEOTools facilitate video downloading tasks.

Video Verification: This service employs various devices such as cameras, smart security cameras, and smartphones to confirm individuals' identities through photos and video materials. Tools like the InVID Verification Plugin are utilized for video material verification purposes.

Video Editing: Video editing, also known as montage, involves manipulating and merging video files to create a finalized video project. Video editors offer features like cutting video clips, adjusting sound, adding digital effects, and making technical alterations to video files. Tools such as Clideo and Kapwing facilitate video editing tasks.

INSIGHTS THROUGH VISION – EXPLORING THE REALM OF IMAGE ANALYSIS SOFTWARE

Image Analysis Software, also referred to as image recognition software or computer vision, utilizes artificial intelligence techniques to process images and extract pertinent details. Machine learning

algorithms are commonly employed to identify various objects, offering a plethora of practical applications across different industries.

Reverse Image Search: Reverse Image Search entails using image patterns to conduct searches within Content-Based Image Retrieval (CBIR) systems. The reference image serves as a crucial element in this process, as the system leverages its structure for information retrieval. Tools such as TinEye and Google's Image Search facilitate reverse image searches effectively.

Image Analysis: Image analysis involves extracting meaningful information from digital images using digital image processing techniques. Tasks range from simple operations like reading barcodes to complex processes such as facial recognition. While computers are indispensable for analyzing vast amounts of data and performing intricate computational tasks, the human visual cortex remains invaluable for high-level information analysis. Many image analysis tools draw inspiration from models of human visual perception, incorporating features like edge detectors and neural networks. AperiSolve and SnapWonders are among the tools available for performing image analysis tasks.

Image Forensics: Image forensics employs image science principles and expert knowledge to interpret images within legal contexts. This includes analyzing image content and the images themselves within a legal framework. Detection of image forensics-related issues can be facilitated through tools such as PhotoForensics and FotoForensics.

Metadata Examination: Metadata comprises information about other data often found in files but not readily visible. Serving various purposes, metadata includes details about the author, creation date, and other relevant information. A metadata viewer like Metadata2Go.com grants access to concealed metadata in files such as images, documents, videos, and audio recordings. It proves beneficial for preserving privacy and gaining insights into information not immediately apparent. Image metadata can be examined using tools like ExifData and Jimpl.

Image to Text Conversion: Image to text conversion tools enable users to extract text from photos and other visual content. Leveraging Optical Character Recognition (OCR) technology, these tools extract text from images, facilitating copying. This capability is particularly useful for extracting text from formats like PNG. Online OCR and OCR.space (as a browser extension) are examples of tools offering image to text conversion functionality.

Face Recognition: Face recognition technology is utilized to identify human faces in images and videos, encompassing tasks such as establishing the identity of faces across different images or locating specific faces within extensive collections of images. This technology finds significant application in security and identification scenarios. Tools like PimEyes and Betaface facilitate face recognition tasks effectively.

Steganography Detection: Steganography involves concealing information within other data or images to evade detection. Steganography detection aids in identifying hidden information within files, including changes in file size, format, last modification date, and other indicators suggestive of steganography. Detection of steganography can be performed using tools like McAfee.

Image Geolocation Estimation: Image geolocation estimation enables users to determine the location where an image was captured through a cartographic view. This is achieved by manipulating or clicking on a map marker based on the image. Additionally, these tools can estimate the geolocation of uploaded images. TIB Labs GeoEstimation is an example of a tool for performing image geolocation estimation tasks.

INSIGHTS AND SAFEGUARDS - ESSENTIAL TOOLS FOR DOMAIN ANALYSIS AND CYBERSECURITY

The domain analysis process entails software engineers gathering essential information to comprehend the context of a problem and make informed decisions throughout the software engineering lifecycle. This process aims to acquire sufficient knowledge about the general area of business or technology where the software will be utilized. Tools such as DomainTools Whois and CentralOps can be employed to research domain information effectively (Smith, J. et al., 2023).

For Malware URL scanning, the tool is utilized to inspect URLs for malware and potential identity threats. IPQS' malware URL scanner offers real-time results with precise analysis facilitated by machine learning algorithms. This tool enables users to check URLs for various threats, including identity theft, malware, viruses, abuse, or reputation issues. Users can safeguard themselves from suspicious links, scams, or hazardous websites by scanning user-generated content, email messages, and links. Notably, IPQS manages an extensive internet threat network, allowing for swift detection of malicious URLs, suspicious links, and fraudulent behavior. Threat feeds and tools such as URLScan and URLVoid can be utilized to ensure URLs are not infected with malware or behaving suspiciously (Brown, A. et al., 2022).

DNS lookup is akin to looking up a phone number in a directory, as it involves obtaining DNS records from DNS servers. This process enables interconnected computers, servers, and smartphones to translate email addresses and domain names into meaningful numeric addresses. Tools such as DNSChecker and ViewDNS facilitate the discovery of information about domain name systems (DNS) (Jones, K. et al., 2021).

Blacklist checks are crucial for testing the IP address of a mail server against numerous DNS-based email blacklists to prevent email deliverability issues caused by blacklisting. Blacklist Alert and MXToolBox offer tools to check if a domain is listed in a spam database, reducing the likelihood of emails being marked as spam (Taylor, R. et al., 2020).

The "Image Extractor" Chrome extension permits users to extract images and related details from web page content, including image names, alt texts, and URLs. This tool enables users to download individual images, copy image URLs, and download all images as a ZIP file. Extract.Pics and Download All Images (extension) are platforms where users can find the Image Extractor tool (Wilson, M. et al., 2019).

Plagiarism detection tools like Copyscape and SimilarWeb aid in identifying cases of plagiarism or copyright infringement within documents or works. These tools help find websites with similar content, assisting in maintaining originality and integrity in content creation (Clark, L. et al., 2021).

Web archiving involves collecting parts of the World Wide Web to preserve information in an archive for future researchers, historians, and the public. Organizations like the Wayback Machine and platforms such as Internet Archive and Archive.ph facilitate browsing the history of web pages (Garcia, S. et al., 2020).

Malware analysis tools like VirusTotal and Sucuri SiteCheck aid in understanding the behavior and purpose of suspicious files or URLs to uncover potential threats. These tools assist in identifying and mitigating malware threats effectively (Miller, D. et al., 2018).

ENHANCING WORK ENVIRONMENT WITH FEATURE-RICH EXTENSIONS

Browser extensions with additional features to enhance your work environment, such as ad-blocking, can significantly contribute to the battle against disinformation. As per reliable reviews, some of the top ad blockers in 2023 are Adblock Plus, AdGuard, and uBlock Origin. While each of these extensions offers seamless ad blocking, they differ in their capabilities (Jones, M. et al., 2023). For instance, uBlock Origin excels in blocking various types of ads, whereas Adblocker for YouTube specifically targets autoplay video ads. It is important to note that uBlock Origin, distinct from uBlock or µBlock, is a highly popular extension available across multiple browsers. However, users must be cautious when installing, as extensions with similar names may vary in functionality. This lightweight and efficient extension conserves memory and processor usage, ensuring a hassle-free browsing experience. Additionally, uBlock Origin provides enhanced security features without disrupting online activities, offering access to various lists like Fanboy's Enhanced Tracking List and spam404.

In terms of ad-free YouTube viewing alternatives, uBlock Origin ranks among the top eight advanced alternatives. For users preferring a Chromium-based browser for ad-free YouTube experience, Kiwi browser is a recommended option. With support for browser extensions, users can install uBlock Origin and SponsorBlock to enjoy uninterrupted YouTube video watching while retaining the ability to sign in to their Google account, unlike some other alternatives such as YouTube Vanced.

ScriptSafe, a Chrome extension, empowers users with control over their web browsing, ensuring a secure experience. It reinforces the secure and encrypted HTTPS protocol for protected communication over the internet. Furthermore, the Location Guard Extension facilitates easy alteration of geographical location to safeguard privacy by allowing users to set desired latitude and longitude coordinates.

Canvas Fingerprint Defender is a lightweight extension designed to conceal users' real canvas fingerprints by introducing random false values, thereby thwarting tracking attempts without outright blocking canvas fingerprinting.

For journalists and fact-checkers combatting disinformation, the InVID WeVerify extension serves as a potent tool, particularly for verifying videos and images on social media platforms.

Image Downloader - Image Search - Pic Finder is a compact tool tailored for searching and downloading images from the internet efficiently.

SingleFile, a Safari extension, enables users to save entire web pages as a single HTML file, inclusive of images, styles, frames, and fonts.

Lastly, User Agent Switcher facilitates emulation of different browsers and operating systems within the Chrome browser, allowing users to browse the internet as if they were using alternative browsers (Brown, A. et al., 2022).

CHOOSING THE RIGHT ENGINE AND MAXIMIZING RESULTS WITH OPERATORS

Choosing the right search engine is crucial to meet your specific needs. Popular options include Google, Bing, Yahoo!, DuckDuckGo, and Carrot2.

To refine search results effectively, utilize search operators, or "dorks," available in most search engines. Here are some commonly used ones:

Quotation Marks (""): Enclose phrases in quotation marks to find results containing the exact phrase, like "fake news."

Asterisk Operator (*): Use the asterisk to replace missing words or letters, such as "fake news is * information."

Minus Operator (-): Exclude specific words from results by preceding them with a minus sign, like "fake news" -propaganda.

Site Operator: Specify results from particular pages or domains with this operator, e.g., site:"fake news" enisa.europa.eu.

Link Operator: Find pages linking to a specific page using this operator, such as link:"fake news" youtube.com.

Filetype Operator: Search for specific file types, like "fake news" filetype:pdf.

Intitle Operator: Discover pages with specific words in the title, e.g., intitle:"fake news."

Inurl Operator: Locate pages with specific words in the URL, like inurl:"fake news."

Intext Operator: Find pages containing specific words within the text, such as intext:"fake news."

Translation services like Google Translate, Bing Translator, and DeepL are invaluable for translating text between languages. Visit sites like https://translate.google.com, https://www.bing.com/translator, and https://www.deepl.com/translator.

For simultaneous searches in two languages, consider tools like https://2lingual.com.

ENSURING EMAIL INTEGRITY THROUGH TOOLS AND TECHNIQUES FOR VALIDATION AND ANALYSIS

Email validation is crucial for ensuring that email addresses are legitimate and capable of receiving messages, which helps minimize spam and maintain the sender's credibility. Platforms such as https://tools.emailhippo.com and https://centralops.net/co provide tools for email validation.

Email sender reputation, essential for successful email delivery, is a rating assigned by ISPs to organizations sending emails. A higher reputation increases the chances of emails reaching recipients' inboxes. Websites like https://emailrep.io and https://easydmarc.com/tools/ip-domain-reputation-check offer analysis of email address reputation.

A Blacklist Check examines email addresses against spam blacklists maintained by ISPs, flagging blacklisted addresses as spam. You can check an email's blacklist status on websites like https://mxtoolbox.com/blacklists.aspx and https://dnschecker.org/ip-blacklist-checker.php.

Email headers contain metadata about the sender, recipient, and route, verifying email authenticity. Access email headers through email clients or sites like https://mxtoolbox.com/Public/Content/EmailHeaders.

Email Header Analysis scrutinizes sender authenticity, IP address, and other data, which can be analyzed on platforms like https://toolbox.googleapps.com/apps/messageheader and https://www.ip-trackeronline.com/email-header-analysis.php.

IP address analysis reveals IP owners, geolocation, and fraud history, with details available on sites like https://www.ipaddress.com/reverse-ip-lookup and https://securitytrails.com.

Attachment Analysis dissects email attachments for security assessment, often employing Advanced Attachment Analysis by cybersecurity experts.

File Types and Security vary, with text files (.txt) generally safe, while image (.jpg) and compressed files (.zip/.rar) pose risks. Safe formats include photos (JPEG, PNG), documents (PDF, DOCX), video (MP4), and audio (MP3). Verify file types on sites like https://www.checkfiletype.com/ and https://filext.com/file-extension/CHECK.

Malware analysis detects and identifies threats in new malware variants, often conducted through Windows security settings, involving behavioral forensics, code, and memory analysis. Distinguish between analysis and detection on platforms like https://www.virustotal.com/gui/home/upload and https://www.hybrid-analysis.com.

HARNESSING SOCMINT TOOLS FOR SOCIAL MEDIA DATA GATHERING AND ANALYSIS

Tools for gathering and analyzing data from social media, known as SOCMINT, are invaluable for extracting insights and intelligence from publicly available social media content. These tools aid in identifying and monitoring extremist groups, tracking public sentiment, and supporting law enforcement investigations. A popular tool for social media search is Social-Searcher.

Twitter Analytics provides businesses with a comprehensive dashboard to monitor the performance of their Twitter campaigns. Tools like SocialBearing and TweetBeaver facilitate the analysis and tracking of activities on Twitter. Hoaxy is useful for visualizing the spread of information on social media, while TweetDeck enables real-time tracking of Twitter activities. For downloading video content from Twitter, the Download Twitter Video tool is available.

Facebook, a widely used social network, allows users to connect and share with family and friends. The platform's search tool indexes all Facebook content, including photos and "liked" items, filtering them based on privacy settings. The free Facebook Video Downloader at FDown allows users to save favorite videos for offline viewing. SowSearch and IntelTechniques provide resources for searching profiles and accessing analytical tools on Facebook.

LinkedIn, the largest professional network, facilitates business opportunities, professional relationships, and skill acquisition. Users can showcase their experience, skills, education, and connect with other professionals. Recruitin offers profile search capabilities, Inlytics provides analytics tools, and ExpertsPHP allows for downloading video content from LinkedIn.

Instagram, a popular photo and video sharing app, enables users to share content with followers, browse, comment, and engage with posts. Inflact Profile Analyzer is useful for Instagram profile analysis, while Analisa.io offers analytics and activity tracking tools. Instadp facilitates video downloading from Instagram.

TikTok, known for short video clips, offers various effects and collaborative features. OSINTCombine Quick Search aids in searching TikTok, Social Blade provides channel analytics, and TikTok Downloader allows for downloading video content.

YouTube, a leading video-sharing platform, offers tools like YouTube Metadata and YouTube Studio for analyzing channels and metadata. SnapSave enables the downloading of video content from YouTube.

NAVIGATING THE DISINFORMATION ERA: CHALLENGES, AWARENESS, AND SOLUTIONS

The rise of disinformation in the media landscape presents a significant contemporary challenge, with its spread through digital channels posing various detrimental effects. These include the disruption of democratic systems, polarization of debates, health risks, and threats to citizen safety. Notably, events like the American presidential elections in 2016 and 2020, Brexit referendum, and the COVID-19 pandemic have underscored the impact of disinformation (Pennycook and Rand, 2021; Loomba et al., 2021).

The COVID-19 pandemic had widespread effects, including on the media sector. Economic disruptions impacted media operations and program quality due to reduced social activities aimed at preventing virus spread (Popovac, J., Gavran, V., 2021).

Surveys indicate widespread awareness of disinformation's dangers among citizens. Research by the Pew Research Center and Eurobarometer highlights concerns about disinformation's role in spreading confusion and its recognition as a problem by a majority of American and EU citizens (Barthel, Mitchell, and Holcomb, 2016; Edukacija.hr, 2020 as cited in Begović and Labaš, 2021).

Mainstream media often amplify information from social networks without adequate verification, prioritizing engagement metrics over accuracy. Media literacy plays a crucial role in democratic development, with media framing shaping public opinion (Holy, M.; Borčić, N., 2023).

Educating individuals about disinformation is vital for informed decision-making. Promoting critical thinking and providing tools for information verification can enhance resistance to false narratives. When encountering individuals spreading disinformation, polite and effective communication, backed by verified information, can be more impactful than condemnation. Smart sharing of verified information is essential for combating disinformation and fostering a trustworthy information environment.

In the research we conducted, 278 participants participated (63.3% M, 36.7% F) with an average age of 29.29 years (Sd= 6.36). All participants were students of the Polytechnic of Criminology and Public Security (69.9% - Professional study of criminology, 30.1% - Specialist graduate study) of which 74.8% are employees of the Ministry of Internal Affairs. Of all police officers in the sample, with an average length of service of 6.23 years (Sd= 5.37), 23.4% of them work in basic police work, 18% in criminal work, 15.1% in border work, 8.6% in traffic and 5.1% in intervention police unit.

This statement describes the participant demographics and characteristics of a research study. Here is a breakdown of the information provided:

Number of Participants: The research involved 278 participants.

Gender Distribution: Among the participants, 63.3% identified as male (M), while 36.7% identified as female (F).

Average Age: The average age of the participants was 29.29 years.

Standard Deviation of Age: The standard deviation of the participants' ages was 6.36, indicating the spread or variability of ages within the group.

Educational Background: All participants were students of the Polytechnic of Criminology and Public Security.

Program of Study: Within the Polytechnic, 69.9% were enrolled in the Professional study of criminology, while 30.1% were enrolled in the Specialist graduate study.

Employment Status: A significant portion (74.8%) of the participants were employees of the Ministry of Internal Affairs.

Occupational Distribution: Among the participants who were police officers, the distribution of their roles was as follows:

- 23.4% worked in basic police work,
- 18% worked in criminal work,
- 15.1% worked in border work,
- 8.6% worked in traffic-related tasks, and
- 5.1% worked in the intervention police unit.

Average Length of Service: The average length of service among police officers in the sample was 6.23 years.

Standard Deviation of Length of Service: The standard deviation of the length of service was 5.37, indicating the variability in the amount of time participants had been in their roles.

Overall, this information provides insights into the composition of the participant pool, including their demographics, educational backgrounds, employment status, and occupational roles within the Ministry of Internal Affairs.

Table 1. *Verification of Truth/Authenticity of Information – Socio-Demographic Data*

		Year_of_study	Age	Internship_MoI	Knowledge of English	Place of residence	Grade point average	Verification of the veracity of the information COMP
Year_of_study	r	1	.132*	.206**	.019	-.008	.021	.004
	Sig.		.029	.001	.756	.898	.740	.947
	N	274	274	273	262	274	255	274
Age	r	.132*	1	.694**	-.208**	.014	-.032	-.055
	Sig.	.029		.000	.001	.815	.605	.359
	N	274	278	277	265	278	259	278

Internship_MoI	r	.206**	.694**	1	-.298**	.005	-.004	-.051
	Sig.	.001	.000		.000	.940	.952	.400
	N	273	277	277	264	277	258	277
Knowledge of English	r	.019	-.208**	-.298**	1	.031	-.008	.028
	Sig.	.756	.001	.000		.618	.899	.649
	N	262	265	264	265	265	249	265
Place of residence	r	-.008	.014	.005	.031	1	-.089	.080
	Sig.	.898	.815	.940	.618		.151	.183
	N	274	278	277	265	278	259	278
Grade point average	r	.021	-.032	-.004	-.008	-.089	1	.007
	Sig.	.740	.605	.952	.899	.151		.913
	N	255	259	258	249	259	259	259
Verification of the veracity of the information COMP	r	.004	-.055	-.051	.028	.080	.007	1
	Sig.	.947	.359	.400	.649	.183	.913	
	N	274	278	277	265	278	259	278

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

None of the social-dem variables correlates significantly with the variable Checking the truth/authenticity of information.

Table 2. *Experiences with Security and Probabilities of Using Security Protection Methods*

		Victim/Target of Cyber Attack COMP	Probability of using a COMP security protection method	Verification of the veracity of the information COMP
Victim/Target of Cyber Attack COMP	Pearson Correlation	1	-.199**	-.063
	Sig. (2-tailed)		.001	.294
	N	278	278	278
Probability of using a COMP security protection method	Pearson Correlation	-.199**	1	.410**
	Sig. (2-tailed)	.001		.000
	N	278	278	278

Verification of the veracity of the information COMP	Pearson Correlation	-.063	.410**	1
	Sig. (2-tailed)	.294	.000	
	N	278	278	278

**. Correlation is significant at the 0.01 level (2-tailed).

Checking the truth/authenticity of information significantly positively correlates with the probability of using security protection methods (r=0.410, p<0.01). Participants who are more likely to use methods to verify the truth/authenticity of information are also more likely to use methods to protect security. Also, negative experiences with security on the Internet are significantly negatively related to the likelihood of using security protection methods (r=-0.199, p<0.01), so people who are more likely to use security protection methods have fewer negative experiences with security on the Internet. Negative experiences with Internet security are not associated with the likelihood of using methods to verify the truth/authenticity of information.

Table 3. *Awareness of Disinformation and Perception of Other People's Awareness of Disinformation*

		I am informed about the disinformation of COMP	People are informed about COMP disinformation	Verification of the veracity of the information COMP
I am informed about the disinformation of COMP	Pearson Correlation	1	.035	.354**
	Sig. (2-tailed)		.562	.000
	N	278	278	278
People are informed about COMP disinformation	Pearson Correlation	.035	1	-.037
	Sig. (2-tailed)	.562		.535
	N	278	278	278
Verification of the veracity of the information COMP	Pearson Correlation	.354**	-.037	1
	Sig. (2-tailed)	.000	.535	
	N	278	278	278

**. Correlation is significant at the 0.01 level (2-tailed).

Checking the truth of information is positively and significantly related to being informed about disinformation (r=0.354, p<0.01) – participants who think they are more informed about disinformation are also more likely to use methods of checking the truth of information.

Table 4. *Perception of the Frequency of Disinformation*

		Frequency of disinformation in the media COMP	Frequency of disinformation on social networks COMP	Verification of the veracity of the information COMP
Frequency of disinformation in the media COMP	Pearson Correlation	1	.547**	.181**
	Sig. (2-tailed)		.000	.002
	N	278	278	278
Frequency of disinformation on social networks COMP	Pearson Correlation	.547**	1	.253**
	Sig. (2-tailed)	.000		.000
	N	278	278	278
Verification of the veracity of the information COMP	Pearson Correlation	.181**	.253**	1
	Sig. (2-tailed)	.002	.000	
	N	278	278	278

**. Correlation is significant at the 0.01 level (2-tailed).

Verification of the truth of the information is positively and significantly related to the perception of the frequency of disinformation in the media ($r=0.181$, $p<0.01$) and on social networks ($r=0.253$, $p<0.01$). Participants who believe that there is more disinformation in the media and on social networks are also more likely to use methods of verifying the veracity of information. As expected, the perception of the frequency of disinformation in the media and on social networks is positively and significantly correlated ($r=0.547$, $p<0.01$).

Table 5. *Frequency and Amount of Use of Social Networks and Internet Portals*

			23.How often do you go to social networks?	24. How much time do you spend a day on social networks?	29. How often do you visit internet portals?	30. How much time do you spend daily on internet portals?	31. How often do you share content on social networks?	32. How often do you post your own content on social media?	Verification of the veracity of the information COMP
23.How often do you go to social networks?	r	1	.955**	.138*	.121*	-.078	-.136*	.074	
	Sig.		.000	.021	.044	.196	.023	.217	
	N	278	278	278	278	278	278	278	

24. How much time do you spend a day on social networks?	r	.955**	1	.220**	.195**	-.073	-.133*	.071
	Sig.	.000		.000	.001	.223	.027	.237
	N	278	278	278	278	278	278	278
29. How often do you visit internet portals?	r	.138*	.220**	1	.913**	.174**	.137*	-.052
	Sig.	.021	.000		.000	.004	.022	.389
	N	278	278	278	278	278	278	278
30. How much time do you spend daily on internet portals?	r	.121*	.195**	.913**	1	.202**	.113	-.037
	Sig.	.044	.001	.000		.001	.060	.542
	N	278	278	278	278	278	278	278
31. How often do you share content on social networks?	r	-.078	-.073	.174**	.202**	1	.522**	-.040
	Sig.	.196	.223	.004	.001		.000	.505
	N	278	278	278	278	278	278	278
32. How often do you post your own content on social media?	r	-.136*	-.133*	.137*	.113	.522**	1	-.081
	Sig.	.023	.027	.022	.060	.000		.180
	N	278	278	278	278	278	278	278
Verification of the veracity of the information COMP	r	.074	.071	-.052	-.037	-.040	-.081	1
	Sig.	.217	.237	.389	.542	.505	.180	
	N	278	278	278	278	278	278	278

None of the variables of the frequency and amount of use of social networks and internet portals correlates significantly with the variable of verifying the truth of the information.

DISCUSSION

The results of the conducted research show that the majority of respondents (66.9%) believe that they are sufficiently informed about the dangers of disinformation, and that they easily distinguish disinformation from the truth (55.4%), while less than half of them (48.9%) believe that they are sufficiently informed about the ways to distinguish disinformation.

Research conducted on a small sample of diverse Croatian students (Kurelović, Tomac and Polić, 2021) shows significantly higher results of even 75% of students who believe that they recognize fake news well or very well, while research on the American population shows that 39% of them feel very confident in their ability to spot fake news (Barthel, Mitchell, & Holcomb, 2016). Of the sociodemographic data, only gender was found to be related to verifying the truth of information on the Internet – male students estimate that they more often use methods to verify the truth of information they encounter on the Internet. Although this data does not refer to the objective ability to recognize disinformation, it is consistent with the data of a large German study from 2023, in which the results showed that men are more successful than women in detecting fake news (Arin, Mazrekaj, and Thum, 2023), while other studies they do not find such differences (Almenar et al., 2021). Many studies show that younger individuals are more successful in recognizing disinformation (Guess et al., 2019; Gottfried

and Grieco, 2018; Abrams, 2021), but this was not obtained in this study. The most likely reason is insufficient heterogeneity of the sample with regard to age and insufficient representation of the older population (despite the age range in the sample of 18-50 years old, M=29.29, Sd=6.36).

Furthermore, men use methods to verify the truth of information significantly more often than women ($t=2.674$, $df=276$, $p=0.008$), while the regression model resulted in the two most significant predictors: individuals who are more likely to use methods to protect their privacy and security on the Internet ($\beta=0.7$, $p < .05$) and individuals who believe that they are better informed about the dangers and ways to recognize disinformation ($\beta=0.106$, $p < .05$) more often use methods to verify the truth of information ($R2=0.551$, $F=168.821$, $p<0.001$). Further analysis of the correlations suggests that those individuals who believe that disinformation has a more significant impact on society and that disinformation is more frequent in the media also use methods to verify the veracity of information more often.

Based on the approach presented in the paper and the research conducted, we could propose learning outcomes for a course that would focus on information and communication technologies and their disuse through the creation and dissemination of disinformation.

The European Commission highlights the importance of enhancing society's resilience to disinformation through the development of media literacy and critical digital competences (European Commission, 2018).

The guide "Using Social Media in Community-Based Protection" (January 2021) aims to assist UNHCR country offices in leveraging social media to safeguard People of Concern (PoCs) and uphold their rights. It provides guidance on developing a Community-Based Protection (CBP) strategy that aligns with UNHCR's data protection policy and respects the privacy and security rights of PoCs. The objective is to establish sustainable digital frameworks that inclusively represent community members and formulate appropriate protection measures on social media platforms.

Numerous educational resources in Croatian have been produced, including the manuals "How to recognize disinformation and fake news - Development of media literacy" (Ciboci, Kanižaj, and Labaš, 2018) and "Manual for checking information from the media" (Dejanović, 2020).

Many studies show that individual factors (cognitive, social and affective) play a significant role in explaining beliefs (Ecker et al., 2022; Bryanov and Vziatysheva, 2021) and behavior (Pennycook and Rand, 2021) related to disinformation. The lack of mentioned data, such as measures of personality, cognitive styles, reasoning, emotional experience, etc., reduce the possibility of a clearer understanding of the mechanisms behind the investigated phenomena and individual differences that can play a key role in understanding these behaviors and beliefs. The aforementioned limitation also provides guidelines for upgrading future research in this area.

LEARNING OUTCOMES

Learning outcomes play a crucial role in developing awareness and competencies necessary to tackle the issue of disinformation in the digital era and uphold the quality of information and public discourse. Here are the paraphrased learning outcomes:

- Understanding Disinformation:
- Ensure participants grasp the concept of disinformation, distinguishing it from truthful information and identifying manipulated news.

- Recognizing Global Dissemination of Disinformation:
- Foster awareness among participants regarding the widespread nature of the disinformation problem, impacting societies worldwide.
- Role of Digital Technology:
- Enable participants to comprehend how digital technology, particularly social media, facilitates the dissemination of disinformation.
- Identifying Disinformation Actors:
- Enhance participants' ability to recognize various actors involved in propagating disinformation, including bots, troll factories, and others.
- Social Aspects of Disinformation:
- Provide insights into the societal impacts of disinformation on social discourse and democracy.
- Recognizing the Need for a Systematic Approach:
- Emphasize the necessity for a systematic approach to combat disinformation at both individual and institutional levels.
- Challenges in Disinformation Detection:
- Raise awareness about the challenges associated with identifying manipulated news, even for digitally literate individuals.
- Awareness of Legal Regulation of Digital Platforms:
- Highlight participants' awareness of legal issues surrounding digital platform regulation and efforts to counter disinformation.
- Information Verification Tools:
- Equip participants with knowledge of various tools and techniques for verifying information, including source verification and image analysis.
- Importance of Combating Disinformation:
- Stress the critical role of addressing disinformation in safeguarding the integrity of information infrastructure and democracy.
- Understanding the Importance of Browser Extensions:
- Recognize the significance of browser extensions in enhancing online security and functionality.
- Browser Extension Role in Combating Disinformation and Ad Blocking:
- Help participants understand how browser extensions can assist in combating disinformation and blocking advertisements.
- Familiarity with Popular Browser Extensions and Their Features:
- Identify popular browser extensions like Adblock Plus and uBlock Origin and understand their features for ad blocking and enhanced security.
- Ability to Choose the Right Browser Extension:
- Enable participants to understand the criteria for selecting the appropriate browser extension based on effectiveness, ease of use, and security.
- Advanced Search Techniques and Search Operators:
- Provide knowledge of search operators for precise filtering of search results.
- Knowledge of Email Verification and Analysis Tools:
- Ensure participants understand the process of verifying email validity and reputation, along with using tools for email analysis.

- Analysis of File Security and Malware:
- Familiarize participants with different file types and their security levels, as well as the process of analyzing malware.
- Utilizing SOCMINT Tools for Social Media Information Collection and Analysis:
- Emphasize the importance of SOCMINT tools in social media analysis and enable participants to utilize these tools effectively.
- Importance of Monitoring and Analyzing Online Activity:
- Help participants understand the significance of monitoring online activities, including tracking social media campaign performance.
- Capability to Analyze Metadata and Social Media Statistics:
- Equip participants with the skills to analyze metadata and social media statistics effectively.
- Integration of Blockchain Technologies in Education:

Introduce the potential of blockchain technologies in addressing various media ecology issues, including fake news and copyright violations, by ensuring transparency and accountability in content creation and distribution.

These learning outcomes lay the groundwork for understanding browser extensions, search techniques, email analysis, file security, SOCMINT tools, and online activity tracking, which are essential for conducting online research, safeguarding privacy, and analyzing social media information.

CONCLUSION

Combating the widespread dissemination of false news and disinformation in today's digital era requires a comprehensive strategy that addresses both the manipulation and amplification of content. The increasing sophistication of technologies, particularly artificial intelligence, has exacerbated this challenge by enabling the creation of convincing synthetic media. Recognizing disinformation as a dual problem underscores the need for systematic efforts from individuals and institutions alike.

The recommendations put forth in this article, which were drawn from the research conducted at the Police Academy, Ministry of the Interior of the Republic of Croatia, highlight the crucial importance of content verification, source evaluation, and awareness of personal biases. Utilizing web tools and browser extensions for robust verification and defense against disinformation is essential.

Moreover, implementing preventive measures such as employing virtual machines, VPNs, proxy servers, and secure web browsers contributes to establishing a secure digital environment. Specialized tools for analyzing video content and images enable the detection of manipulated or misleading media. Additionally, utilizing advanced search techniques, email-based verification and analysis tools, and social media intelligence (SOCMINT) tools enhances the ability to identify and counter disinformation campaigns effectively.

Ultimately, addressing the challenge of disinformation requires ongoing vigilance and collaboration among experts and institutions to safeguard the integrity of our information and communication infrastructure. By doing so, we uphold public trust and strengthen the foundations of democracy.

Combating disinformation necessitates a multifaceted approach involving education, awareness-raising, and the development of effective tools and techniques. By empowering individuals with the nec-

essary skills and knowledge, we can cultivate a more resilient society capable of navigating the complexities of the digital age while preserving the integrity of information and public discourse.

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EXTORTION OF STATEMENT BY POLICE – RESPECTING THE RIGHT TO REMAIN SILENT

Katarina Živanović, PhD[1]
Ministry of Interior of the Republic of Serbia

INTRODUCTION

Respect for the right to remain silent under police questioning and the privilege against self-incrimination is a field of constant interest for the professional, scientific, and lay public. The reason for the above is that respect for the aforementioned rights is a prerequisite for the realization of modern criminal process principles, but also the postulates on which a democratic legal state rests. Namely, the importance of the right to remain silent during police interrogation and the privilege against self-incrimination stems from the following:

- These are generally recognized international standards that lie at the heart of the notion of a fair procedure and represent a fundamental assumption of respect for basic human rights (see, *inter alia*, *Ibrahim and others v. The United Kingdom,* par. 266; *Saunders v. the United Kingdom*, para. 68);
- The aforementioned right and privilege are a fundamental prerequisite for the implementation of the system of constitutional government (*Miranda v. Arizona)*;
- The right to remain silent under police questioning and the privilege against self-incrimination are closely and directly related to the presumption of innocence, which also constitutes the essence of the right to a fair procedure and which is proclaimed in Art. 6 of the European Convention for the Protection of Human Rights (ECHR);
- Violation of the aforementioned right and privilege can cause false confession of a criminal offense as well as wrongful convictions (Inbau, Reid, Buckley & Jayne, 2013: 353; Grometstein, 2008: 21; Leo, 2009: 335);
- Respect for the right to remain silent and the privilege against self-incrimination is also directly related to the protection of the inviolability of mental and physical integrity and human dignity, as the highest values in the field of human rights proclaimed by national and international instruments.

In accordance with the aforementioned importance of the right to remain silent and the privilege against self-incrimination, it is very important to point out the possibility of their violation and, therefore, the possibility of deviation from the fundamental principle of criminal procedure – the principle of fair procedure. Bearing in mind the nature of the work and the specificity of the tasks of the internal affairs bodies, i.e., the police, it is clear that the police daily face the danger of the possibility of violating the proclaimed human rights and freedoms. As Živanović (2020: 160) points out, the very nature of police work as an imperative imposes: (1) providing protection to all vital values of the state, society, and the individual from the bearers of incriminated forms of behavior and (2) providing protection to human rights and freedoms to such persons. Violation of the right to remain silent and the privilege of self-incrimination can occur when conducting the evidentiary action of hearing of the suspect. Namely, the danger of a possible deviation from the mentioned right lies in the very nature of the power balance between the suspect and authorized officials, i.e., conflicting interests that are at the center of

1 kaca_zivanovic@yahoo.com

communication during the hearing of the suspect. As indicated by Kassin (2005: 219), Leo (2009: 334) and Redlich & Meissner (2009), interrogation is a guilt presumptive process, a theory-driven social interaction led by an authority figure who holds a strong a priori belief about the target and who measures success by his or her ability to extract a confession. According to the above, it can be said that the hearing of the suspect is one of the most complex actions in the process of discovering criminal acts and their perpetrators undertaken by police (Milić and Subošić, 2011: 150). The very fact that there is a representative of the "state apparatus" on the other side causes discomfort and anxiety, even for persons who have not committed any crime, which indicates that this is a form of forced communication (Milić and Subošić, 2011: 150).

In addition to standardizing procedural conditions and principles in accordance with which the said evidentiary action must be conducted, the legislator strengthened the protection of the right to remain silent by criminalizing certain behaviors of officials during the hearing of the suspect. It is primarily about the criminal offense of extortion of statement from Art. 136 of the Criminal Code of the Republic of Serbia (Official Gazette RS, 2005), (hereinafter: CC), since only persons who act in an official capacity and during the conducting of their duties can be appeared as perpetrators of this criminal offense. In addition to the characteristics of the perpetrator, this criminal offense is characterized by the purpose of execution – extorting a statement, as well as the method of execution – using force, threats, or other illegal means or illegal methods. When it comes to the act of committing, it is important to point out that this criminal offense will exist regardless of whether the statement was actually extorted, i.e., it is important that the police took the action of the specified criminal offense with the aim of extorting the statement (Supreme Court of Serbia, 2003). On the other hand, by prescribing the mentioned criminal offense, the legislator does not completely exclude the possibility of influencing the defendant, since, for example, the suggestion of the police to the defendant that it is better for him to give a statement cannot be considered extortion of a statement (Stojanovic, 2018: 505). Bearing in mind the manner in which the crime was committed, Kesić (2018: 41) calls extortion of statement as "internal brutality", and points out that it can be understood as "the use of excessive force in official premises and other hidden places in order to achieve clearly defined goals, and most often due to extorting a confession".

In addition to the above-mentioned criminal offense, the legislator ensured the guarantee of the protection of the right to remain silent by standardizing the criminal offense of abuse and torture (Art. 137, paras. 2 and 3 of the CC). Analyzing the legal provisions that prescribe the mentioned criminal acts, it is concluded that there is no essential difference between extorting a statement (Art. 136 of the CC) and the criminal act of abuse and torture (Art. 137, para. 2 and in connection with para. 3 of the CC). As a result, such a solution leaves open the question of whether, in cases where an official used force or threat to extortion a statement from the defendant, such action will be qualified as torture (Article 137, para. 2, in connection with para. 3 of the CC) or as extortion of a statement. In principle, when an official appears as the perpetrator, in relation to the criminal offense of extorting a statement from Art. 136 para. 1 of the CC, priority should be given to the criminal offense of abuse and torture from Art. 137, para. 2 of the CC (Kolarić, 2018: 38; Ilić & Andrejić, 2023: 70; see also Živanović, 2020: 167). Therefore, in each specific case, the court considers whether the actions taken by the police in order to extort a statement can be characterized as those prescribed by the aforementioned incriminations.

Since such actions of the official affect the will of the defendant, which is in the essence of the right to remain silent and the privilege against self-incrimination, it is up to the court to assess whether the statement was given voluntarily or not. In general, the suspect's statement can be considered voluntary if the will of the suspect prevails "overbearing the suspect's will" (Inbau *et al.*, 2013: 343), since the right not to incriminate primarily refers to respecting the will of the accused to remain silent (*Jalloh*

v. Germanu, para. 102). As Worall (2018: 131) points out, the following criteria can be used to assess whether the defendant's statement was given involuntarily: 1) the police conduct in question, and 2) the characteristics of the accused. When it comes to the behavior of the police, Worall (2018:131) further indicates that the police influence the will of the suspect to give a statement in various ways, such as torture, promises of certain benefits, psychological pressure, etc. However, it is safe to conclude that psychological pressures, promises of leniency, and deception are rarely by themselves enough to render a statement involuntary, but two or more such acts (especially if coupled with physical force) will more than likely result in an involuntary confession (Worall, 2018: 131). Finally, it is important to point out that the presumption of full enjoyment of the privilege against self-incrimination is made by acquainting the defendant with his right to remain silent, that is, with the said privilege. In this sense, any statement taken after the person invokes his privilege cannot be other than the product of compulsion, subtle or otherwise (*Miranda* v. *Arizona*).

METHODS AND APPROACH

Beside normative analysis of relevant legal acts and theoretical analysis of professional and scientific papers by prominent domestic and foreign authors, the following methods were used in the research: analysis of the content of the Internal Affairs Sector Reports of the Ministry of Interior of the Republic of Serbia (representation of criminal charges against officials for the criminal offense of Extortion of statement from Art. 136 of the CC) and analysis of the reports of adult perpetrators of criminal revealed by the Statistical Office of the Republic of Serbia (also representation of criminal charges against officials for the criminal offense of Extorting of statements); analysis of judgments of the European Court of Human Rights as well as the Constitutional Court of the Republic of Serbia.

Standards of the European Court of Human Rights and the Constitutional Court of the Republic of Serbia

When it comes to the European Court of Human Rights (hereinafter: ECtHR) stances regarding the protection of the right to remain silent and the privilege against self-incrimination, it is important to point out the following:

The right to remain silent under police questioning and the privilege against self-incrimination are the generally recognised international standards that lie at the heart of the notion of a fair procedure and represent a fundamental assumption of respect for basic human rights (*Ibrahim and others v. The United Kingdom,* para. 266) and by proclaiming the said right, the defendant protects himself from improper compulsion by the authorities, thereby contributing to the avoidance of miscarriages of justice and to the fulfilment of the aims of Art. 6 of the ECHR (*John Murray v. the United Kingdom*, para. 45; *Ibrahim and others v. The United Kingdom,* para. 266). The basic assumption arising from the right not to incriminate oneself is that the prosecution in a criminal case should prove his thesis against the accused without resorting to evidence obtained through methods of coercion or oppression in defiance of the will of the accused (*Jalloh v. Germany*, para. 100; *Saunders v. the United Kingdom*, para. 68).

The right not to incriminate oneself applies to criminal proceedings in respect of all types of criminal offences without distinction from the most simple to the most complex (*Heaney and McGuinness* v. *Ireland*, para. 57; *Saunders* v. *The United Kingdom*, para. 74). Also, the court points out that the protection of security and public order cannot justify the violation of the right to remain silent and the privilege against self-incrimination (*Heaney and McGuinness* v. *Ireland*, para. 58).

When it comes to the scope of extending the right not to incriminate, it is important to point out that it *only refers to respecting the will of the accused to remain silent, in the sense of ensuring the legal collecting of personal evidence*. In this sense, as the court points out in its decisions (*Jalloh v. Germanu* para. 102; *Saunders* v. *The United Kingdom*, para. 69; etc.), it does not extend to the use in criminal proceedings of material that may be obtained from the accused through the use of compulsory powers but which has an existence independent of the will of the suspect.

The use of the right to remain silent by the accused cannot under any circumstances be used against him; also, informing the accused that under certain circumstances his silence can be used against him should always be considered as "improper coercion" (*John Murray v. the United Kingdom*, paras. 45, 46, and 51).

Privilege against self-incrimination does not protect against the making of an incriminating statement per se but against the obtaining of evidence by coercion or oppression. Therefore, the court must first consider the nature and degree of coercion used to obtain the evidence (*Ibrahim and others v. The United Kingdom,* para. 267). Namely, if the authorities obtained the evidence through oppression or coercion, there was a violation of the rules on lawful obtaining of evidence, that is, evidence obtained in an illegal manner. As the issue of the illegality of evidence is a matter of national legal regulation, the ECtHR does not evaluate whether, according to the provisions of domestic law, certain evidence is legal or not but determines whether certain evidence was obtained in a way that violated the convention rights and then evaluates the contribution of the committed violation to the violation of the right to a fair trial – *Klaas v. Germany*, para. 29; *Jasar v. the former Yugoslav Republic of Macedonia*, para. 49; *Gäfgen v. Germany*, para. 93; *Khan v. the United Kingdom*, para. 34; *Dragojević v. Croatia*, para. 127; *Moreira Ferreira v. Portugal*, para. 83 (Živanović, 2025). The use of the statements of the accused as evidence, which were obtained by the local police authorities by acting contrary to Art. 3 of the ECHR, always leads to a violation of the right to a fair trial from Art. 6 of the ECHR, regardless of whether the treatment during which the contested statement was obtained in the specific case is appointed as torture, inhuman, or degrading treatment. As the ECtHR points out in the decision *Gäfgen v. Germany* (para. 166–167), the use of evidence obtained contrary to the convention prohibition of torture from Art. 3, "regardless of its probative value and regardless of whether its use was decisive in securing the defendant's conviction – it makes the proceedings as a whole automatically unfair" (Živanovic, 2025).

Furthermore, when assessing the violation of the right to a fair trial, the court must first consider the nature and degree of coercion used to obtain evidence (*Bykov v. Russia*, para. 92; *Ibrahim and others v. The United Kingdom*, para. 266). In this sense, the court in each specific case assesses whether the applied level of coercion leads to the destruction of the very substance of the privilege against self-incrimination (*John Murray v. the United Kingdom*, para. 49; *Ibrahim and others* v. *the United Kingdom*, para. 269), but not all direct compulsion will destroy the very essence of the privilege against self-incrimination and thus lead to a violation of fair procedure; what is crucial in this context is the use to which evidence obtained under compulsion is put in the course of the criminal trial (*Saunders v. the United Kingdom, para. 71; Ibrahim and others v. The United Kingdom*, para. 269). The degree of compulsion applied will be incompatible with Art. 6 of ECHR where it destroys the very essence of the privilege against self-incrimination (*John Murray*, para. 49).

In the court's jurisprudence, *there are three types of situations that the court considers to represent the possibility of violation of Art. 6 of the ECHR, except by the use of inappropriate coercion*. It is about the following situations that the court stated in the judgment *Ibrahim and others v. The United Kingdom* (para. 266) and referring to his earlier judgments: 1) where a suspect is obliged to testify under threat of sanctions and either testifies in consequence or is sanctioned for refusing to testify; 2) where physical or psychological pressure, often in the form of treatment that breaches Article 3 of the Convention,

is applied to obtain real evidence or statements 3) where the authorities use subterfuge to elicit information that they were unable to obtain during questioning.

Finally, it is important to point out that the privilege not to incriminate is not absolute, since drawing of inferences from an accused's silence may be admissible (*Weh v. Austria*, para. 46). The ECtHR also reiterates that, given the close connection between the right not to incriminate oneself and the presumption of innocence, Art. 6, para. 2 of the ECHR does not, in principle, prohibit the use of presumptions in criminal law (*Weh v. Austria*, para. 46). Namely, the court considers that immunities cannot and should not prevent the accused's silence, in situations that clearly call for an explanation from them, from being taken into account in assessing the persuasiveness of the evidence adduced by the prosecution. Failure to provide any explanation in such circumstances may, as a matter of common sense, allow the drawing of an inference that there is no explanation and that the accused is guilty (*John Murray v. the United Kingdom*, paras. 47 and 51).

When it comes to the views of the Constitutional Court of the Republic of Serbia regarding the evaluation of violations of the inviolability of mental and physical integrity from Art. 25 of the Constitution of the Republic of Serbia (Official Gazette RS, 2006) as well as violations of the provisions prohibiting the extortion of statements from guarantors (Art. 28), it is important to emphasize the following: *the Constitutional Court considers violations of the aforementioned provisions in light of the violation of the prohibition of torture from Art. 3 of the ECHR,* and bearing in mind that the indicated constitutional rights are essentially identical to the right from Art. 3 of the ECHR. Namely, the Constitutional Court (2017) points out that Art. 3 of the ECHR covers a wide range of actions and punishments and imposes a number of positive obligations on the state. Among other things, this article includes the general obligation that all persons under the jurisdiction of a state are protected from abuse and torture.

Furthermore, it is important to point out that the Constitutional Court, depending on the specific case, assesses the violation of the procedural aspect of Art. 3 of the ECHR and the violation of the material aspect of the said article of the ECHR. When it comes to the violation of the procedural aspect, the court assesses whether an investigation has been conducted against the persons accused of extorting a statement. Thus, in connection with the violation of the procedural aspect, the Constitutional Court (2017a), (referring to the decision of the ECHR *Vladimir Fedorov v. Russia*, para. 67) established that the fact that the defendants for extorting testimony were eventually acquitted is not in itself sufficient to establish a violation of the right from Art. 25 of the Constitution, since the procedural obligation from the aforementioned article is not an obligation of the goal but of the means.

When it comes to assessing the violation of the material aspect of Art. 25 of the Constitution, the Constitutional Court accepted the "beyond reasonable doubt" evidentiary standard established by the ECtHR. Namely, the Constitutional Court (2021) stated that allegations of abuse (*inert alia* and for the purpose of extorting statements) must be supported by appropriate evidence, i.e., evidence "beyond reasonable doubt". In the aforementioned decision, the Constitutional Court, referring to ECtHR practice (*Salman v. Turkey*; *Ireland v. the United Kingdom*), states that such evidence can arise from the coexistence of sufficiently strong, clear, and non-contradictory conclusions or similar undisputed factual assumptions.

Contrary to the above, it is important to point out the decision, in which the Constitutional Court deviated from the generally accepted international standards established by the ECtHR regarding the acceptance of personal evidence obtained by torture. Namely, the Constitutional Court (2017b) found that there was no violation of the right to a fair procedure, even though the judgment of the first-instance court established that the defendant's statements were obtained illegally. The Constitutional Court supported its decision by stating that it was established that the conviction was not based only on that

evidence that was found to be illegal but also on other legal evidence. However, in an opinion in this judgment, one judge pointed out that the standards of the ECtHR must also be respected in this matter.

In their separate opinion, the judge refers to ECtHR practice (*Gäfgen v. Germany*; *Stanimirović v. Serbia*), stating that the use of statements obtained by torture or other bad behavior as evidence for establishing relevant facts in criminal proceedings makes those proceedings as a whole unfair. This opinion applies regardless of the probative value of the statements and regardless of whether their use is decisive for the conviction. As stated in the separate opinion, a different legal reasoning and conclusion would lead to the legalization of a certain type of morally reprehensible procedure, which is contrary to Art. 3 of the ECHR, which in nature would mean the legalization of brutality, inhuman treatment and torture.

Representation of Criminal Charges of the Extortion of Statement (Art. 136 of the CC) and Abuse and Torture (Art. 137 of the CC) in the Republic of Serbia

In order to establish the representation of criminal charges filed against police officers and other officials for committing the criminal offense of extortion of statements as well as abuse and torture, an analysis of the Internal Affairs Sector Report of the Ministry of Interior of the Republic of Serbia and the Statistical Office of the Republic of Serbia was carried out. The analysis of the aforementioned reports covers the period 2017-2023. The results obtained from the analysis of the report are presented tabularly and graphically. The results are presented numerically.[2]

Table 1 shows the overall results obtained by processing the above reports, significant for the research in question. In this sense, the number of criminal charges against police officers submitted by the Internal Affairs Sector for the criminal offenses of extorting a statement (Art. 136 of the CC) and abuse and torture (Art. 137 of the CC) is shown. Representing data for the criminal offense of abuse and torture (Art. 137 of the CC) is expedient, bearing in mind the identity of the aforementioned criminal offenses, if it is a qualified form of the offense from Art. 137 of the CC.

In addition to the above-mentioned data, the data contained in the reports of the Statistical Office were also presented in order to show the representation of mentioned criminal offenses in general in the Republic of Serbia for the period 2017–2023.

Table 1. *Representation of Criminal Charges of the Extortion of Statements (Art. 136 of the CC) and Abuse and Torture (Art. 137 of the CC) in the Republic of Serbia*

Year	Criminal offense	Internal Affairs Sector	Statistical Office			
			Filed criminal charges	Dismissed criminal charges	Indictment filed	Unknown perpetrator
2023	Extortion of statement	0	2	Without data		
	Abuse and torture	3	381			

2 Also, it should be emphasized that the data from the report of the Statistical Office on the submitted criminal charges for the mentioned offenses may also include criminal charges against police officers since there is a possibility that the criminal charges against the police officer for the said criminal offenses were not filed by the Internal Affairs Sector. Accordingly, when reading and interpreting the results of the aforementioned research, this should be kept in mind.

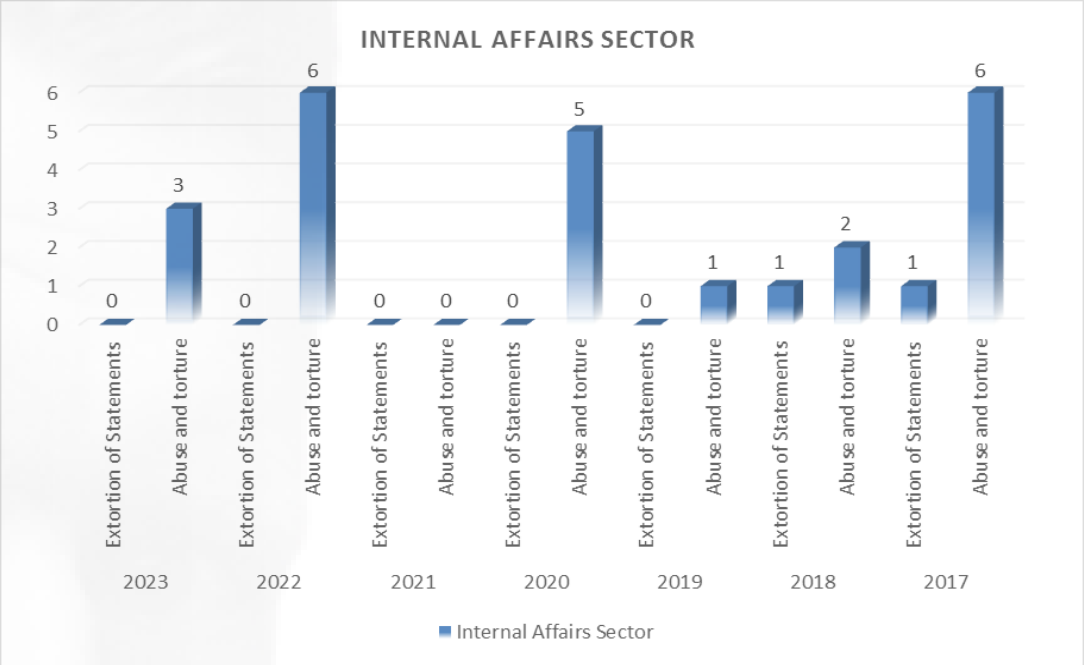
2022	Extortion of statement	0	7	6	0	1
	Abuse and torture	6	403	272	109	23
2021	Extortion of statement	Without data	18	18	0	0
	Abuse and torture		390	233	120	37
2020	Extortion of statement	0	23	21	1	1
	Abuse and torture	5	345	219	75	50
2019	Extortion of statement	0	31	30	1	0
	Abuse and torture	1	373	263	92	18
2018	Extortion of statement	1	20	19	1	0
	Abuse and torture	2	301	211	77	13
2017	Extortion of statement	1	8	8	0	0
	Abuse and torture	6	242	152	72	18
In total	Extortion of statement	2	109	102	3	2
	Abuse and torture	23	2435	1350	545	159

In order to make it easier to see and draw conclusions from the results shown in Table 1, the results significant for the topic of the research will be classified and shown in graphs, as follows:

Graph 1 shows the representation of the criminal offense of extortion of statement (Art. 136 of the CC) and abuse and torture (Art. 137 of the CC) in criminal reports against police officers submitted by the Internal Affairs Sector, starting from 2017 to 2023.

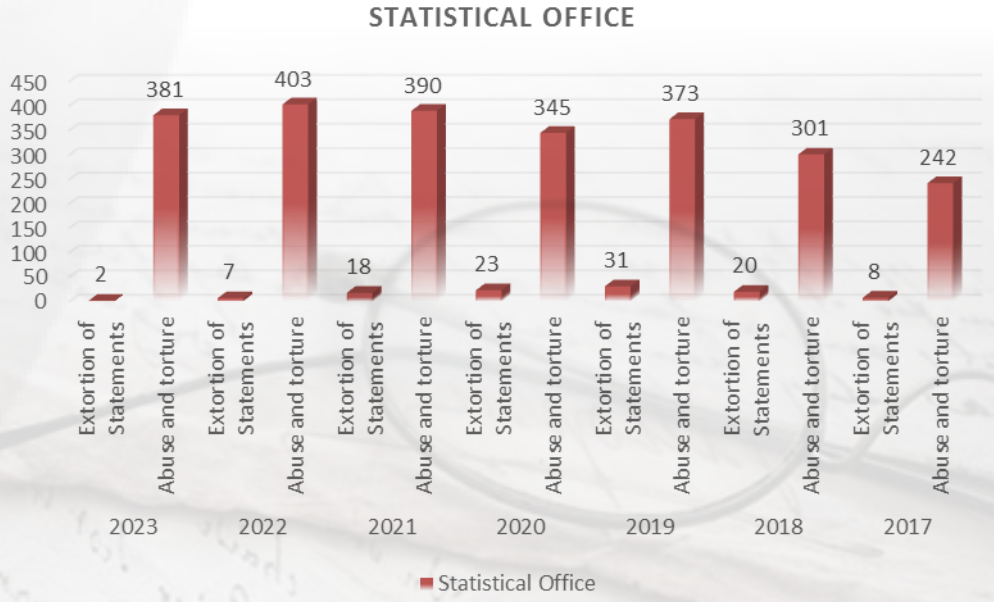
As it follows from the results shown in Graph 1, the number of criminal charges against police officers in the observed period is higher for the abuse and torture (Art. 137 of the CC) than for the criminal offense of extortion of statement (Art. 136 of the CC). The largest number of criminal charges for criminal offenses from Art. 137 of the CC is six, while for the criminal offense from Art. 136 of the CC the largest number of criminal charges is 1. In 2023, 2022, 2020, and 2019, police officers were not charged for the crime of extorting a statement (Art. 136 of the CC), while in 2017 and 2018, one criminal charge was registered each for the aforementioned criminal offences. Unlike the criminal offenses

from Art. 136 of the CC, for the crime of abuse and torture (Art. 137 of CC), criminal charges were filed against police officers in each of the years – 2023, 2022, 2020, 2019, 2018, and 2017. However, the number of filed criminal charges varies from one to six. Namely, a greater number of criminal charges against police officers for criminal offenses from Art. 137 of the CC was recorded in 2017 and 2022 – six criminal charges and in 2020 – five criminal charges, while the lowest number of filed criminal charges was recorded in 2019 – only one criminal charge.



Graph 1.

Graph 2 shows the total representation of criminal charges for the criminal acts of extortion of statement (Art. 136 of the CC) and abuse and torture (Art. 137 of the CC) according to the reports of the Statistical Office of the Republic of Serbia for the time period 2017–2023.



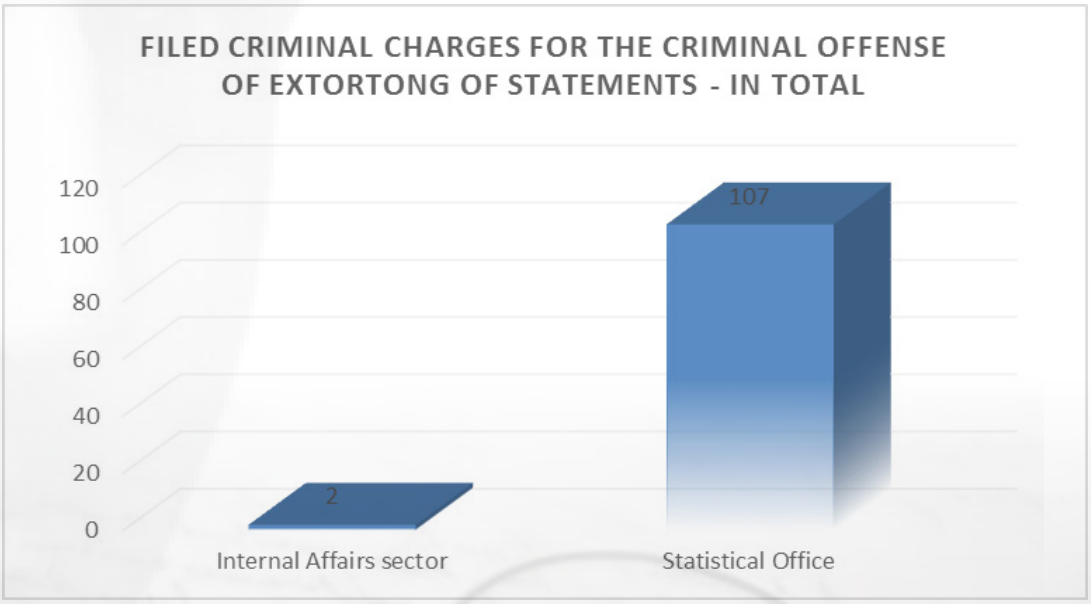
Graph 2.

From the presented results, it can be seen that the number of criminal charges submitted for the criminal offense extortion of a statement is significantly lower compared to the criminal charges submitted for the criminal offense of abuse and torture, which is logical considering that the presented results for the criminal offense of abuse and torture refer to all criminal charges and not only for charges of a qualified form when an official appears in the role of the perpetrator in order to extort a statement.

Observed from the aspect of criminal charges of extortion of statements, it is noted that the largest number was filed in 2019 (31 criminal charges), and then in 2020, 2018, and 2021. A smaller number of criminal charges of the criminal offense from Article 136 of the CC was recorded in 2017 and 2022, while in 2023, two criminal charges were filed for the said criminal offense.

When it comes to the criminal offense referred to in Art. 137 of CC, a somewhat different trend in the representation of criminal charges by age can be observed in relation to the criminal offense from Art. 136 of the CC. Namely, the largest number of criminal charges for abuse and torture was filed in 2022 (403), while a larger number of criminal reports (from 373 to 390) were also filed in 2019, 2021, and 2023. The lowest number of submitted criminal charges, in the observed period, was recorded in 2017 (242 criminal charges).

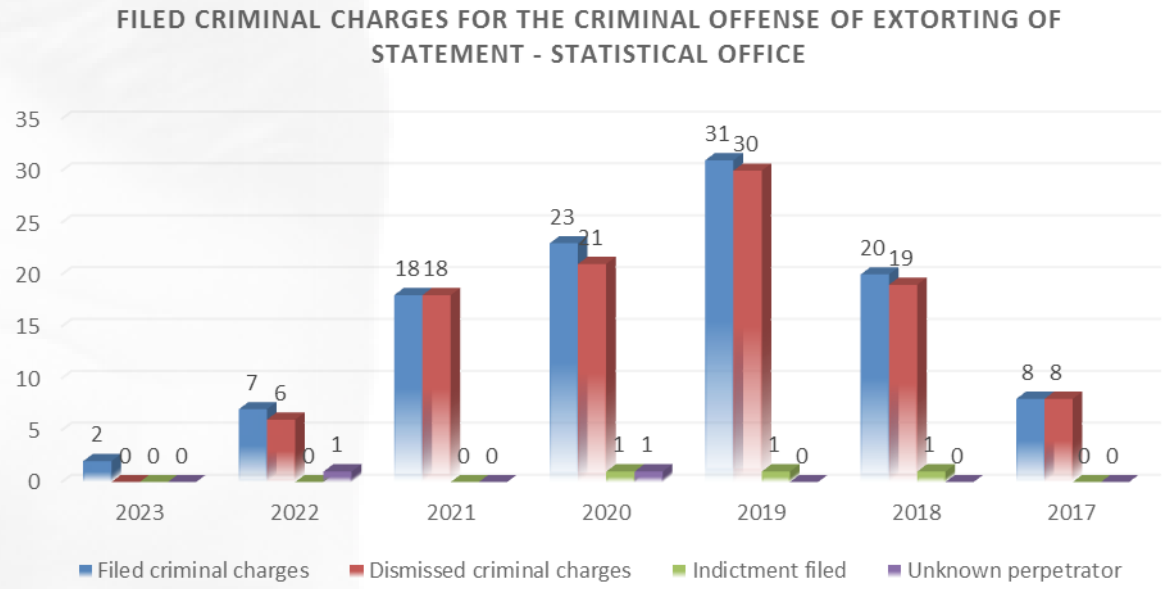
Graph 3 shows the total number of criminal charges filed for the crime of extorting a statement (Art. 136 of the CC) in the period 2017–2023, in relation to the number of criminal charges filed by the Internal Affairs Sector and the total number of criminal charges filed according to the reports of the Statistical Office.



Graph 3.

From the results shown in graph 3, it follows that a total of two criminal charges were filed against police officers by the Internal Affairs Sector in the observed period (2017–2023), while the total number of criminal charges for the crime of extorting a statement is 109. Looking at the above results, it can be established that the percentage of criminal charges filed against police officers by the Internal Affairs Sector in relation to the total number of criminal charges for the said criminal offense makes only 1.83% of the total number of criminal charges.

Graph 4 shows the number of criminal charges filed for the crime of extorting a statement (Art. 136 of the CC), the number of rejected criminal charges, the number of indictments filed, as well as the number of criminal charges filed against an unknown perpetrator. The above results are presented by year for the period 2017–2023.[3]



Graph 4.

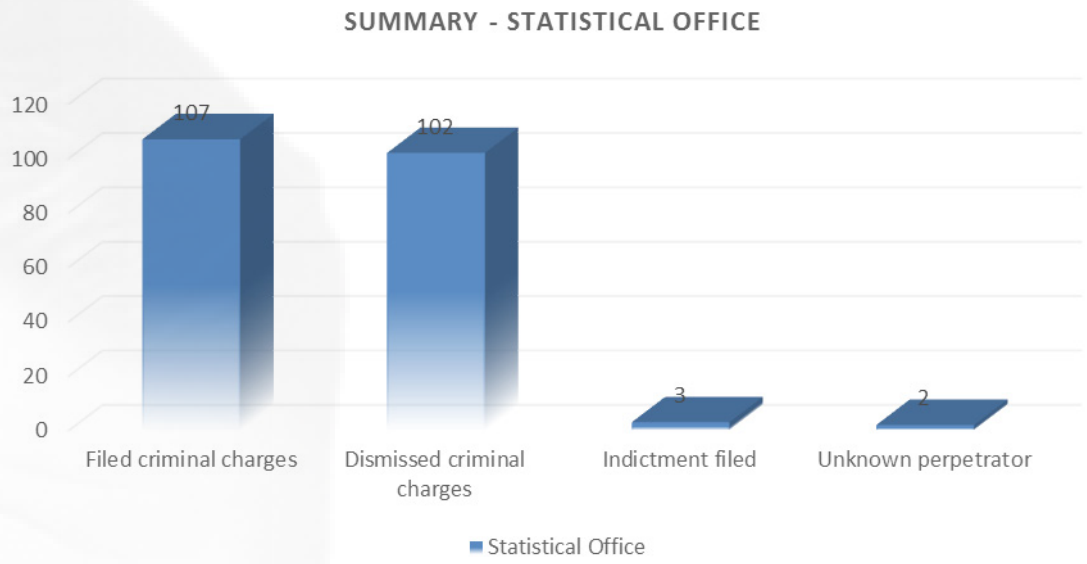
Observed from the aspect of the outcome of filed criminal charges, the same trend can be observed for each of the years shown, that is, the largest number of criminal charges filed for the criminal offense of extorting a statement (Art. 136 of the CC) was rejected. Namely, in the years in which an indictment was filed on the basis of a criminal charge, in none of them was more than one indictment filed. In this regard, one indictment was filed each in 2020, 2019, and 2018, while in 2021 and 2017, all criminal charges filed for the criminal offense of extorting a statement were dismissed. In 2022 and 2020, one criminal case was filed against an unknown perpetrator.

Graph 5 shows data on the total number of filed criminal charges, i.e., the total number of dismissed criminal charges and those filed against an unknown perpetrator, as well as the total number of indictments filed for the crime of extorting a statement in the period 2017–2022.[4]

From the results shown in Graph 5, it follows that of the total number of filed criminal charges for the criminal offense of extorting statements in the period 2017–2022, the largest number of criminal charges were dismissed. Namely, out of 107 criminal charges filed, 102 criminal charges were dismissed, which makes up 95.3% of the total number of criminal charges, in about a little less than 3% (2.8%) of cases an indictment was filed, while a little less than 2% (1.87%) of criminal charges were filed against an unknown perpetrator.

3 For the year 2023, the Statistical Office's statement does not contain data on the number of rejected criminal charges, that is, on the number of indictments filed.

4 No data available for 2023.



Graph 5.

CONCLUSION

Recognition of the right to remain silent during police interrogation and the privilege against self-incrimination as a generally recognized international standard and as the basis of a fair procedure once again confirms that the protection of mental and physical integrity as well as human dignity are the highest values of society. Namely, the importance of the protection and respect of the said right and privilege, in addition to the above, is reflected in their close connection with the realization of the presumption of innocence, which also forms an inseparable part of the fair procedure. The aforementioned importance is confirmed above all by the views of the ECtHR, taken on the occasion of the violation of Articles 3 and 6 of the ECHR. In this sense, the ECtHR, inter alia, established in its decisions that: the right to remain silent under police questioning and the privilege against self-incrimination are the generally recognized international standards that lie at the heart of the notion of a fair procedure and represent a fundamental assumption of respect for basic human rights; the right not to incriminate oneself applies to criminal proceedings in respect of all types of criminal offences without distinction from the most simple to the most complex; the use of the right to remain silent by the accused cannot under any circumstances be used against them, etc.

Considering that they are widely accepted international standards, the above-mentioned stands (mostly) form an integral part of the judicial decisions of the Constitutional Court of the Republic of Serbia. As the stands taken in the analyzed decisions refer, as a rule, to cases in which the petition or constitutional appeal is based on the illegal behavior of the police during the questioning of the suspect, it is very important to apostrophize the results of the research related to the committing of the criminal offense of extorting a statement (Art. 136 of the CC) by the police in the Republic of Serbia. Although the danger of the possibility of acting contrary to the right to remain silent is immanent to the internal affairs bodies, and bearing in mind the nature of their work, by researching the relevant reports of state bodies, it was established that police officers, when conducting the evidentiary act of interrogating a suspect, respect the right to remain silent, i.e., the privilege against self-incrimination. Namely, as it appears from the results of the research, in the observed period (2017–2023) by the Internal Affairs Sector of the Ministry of Interior, no criminal charges were filed for the aforementioned crime in four years (2023, 2022, 2020, and 2019), while in 2017 and 2018, only one case was filed each.

On the other hand, viewed from the aspect of the results obtained from the analysis of reports of the Statistical Office of the Republic of Serbia, the number of dismissed criminal charges for the criminal offense of extorting testimony is almost equal to the number of filed criminal charges for the aforementioned criminal offense.

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TRAFFIC CONTROL TRAINING FOR POLICE OFFICERS CONTROLLING DANGEROUS GOODS TRANSPORT

Dejan Đurđević[1]
Slaviša Lakićević
Sergej Uljanov
Ivica Stanković
Ministry of Interior of the Republic of Serbia

RESEARCH OBJECTIVES AND AIMS

The importance of transporting dangerous goods is immeasurable for a country's economy. As society develops and economic power increases, so does the transport of dangerous goods both as finished products and semi-finished goods. In today's world it is measured in billions of tons per day. The most common forms of transport are road, rail and water transport. Legislators recognize this field's critical importance, and accordingly the obligations of all subjects in the process of transportation, processing and storage of dangerous goods are defined. As in the academic professional scientific field of technical sciences, every student of basic studies knows that in the lifetime of a product, from raw material to end user, the longest period is in the transportation process. It is no surprise that systematic measures have been implemented to achieve maximum safety levels during transportation and emergency response.

One crucial measure involves providing specialized training to traffic police officers within the Ministry of the Interior, to adequately and professionally control participants in hazardous goods transportation, with a specific emphasis on road transport. The training process of police officers includes continuous analysis and evaluation, ensuring the successful transfer of essential knowledge, skills, and attitudes. As a result, these officers are enabled to achieve the desired level of efficiency and functionality in their work.

The aim of the study is to acquaint the professional public with the results achieved and the actions undertaken by the Ministry of the Interior in the process of training members of the traffic police in connection with the control of participants in the transport of dangerous goods. That is, the presentation of achievements in the process of training police officers for managing complex and high-risk tasks on the roads of the Republic of Serbia. It is especially emphasized that the above activity is carried out with maximally rational - restrictive use of budget funds and maximal engagement of available own capacities and interested structures in the field of cooperation and work related to hazardous substances.

RESEARCH METHOD AND APPROACH

The Ministry of the Interior hired its most experienced personnel to address both preventive (developing and implementing professional training) and responsive aspects related to dangerous goods transportation.

1 dejan.djurdjevic@mup.gov.rs

An objective assessment of the need for such training was conducted, drawing on the practical experience of the authors with the firefighting and rescue units in Pančevo and their involvement in traffic police operations. The aim was to comprehensively understand the process of enhancing skills and competencies. In order to review the training process, an analysis was made of both the actions that preceded the implementation of the subject training process of police officers, as well as the existing Curriculum for the controlling of road traffic participants who carry out the transport of dangerous goods, No 01-6136/20. The analysis also included a critical review of the Handbook for trainees of professional training for the controlling of participants in road traffic carrying out the transport of dangerous goods. The Manual was created by the joint effort of professionals, both in the field of creating curricula, as well as work on interventions in emergency with dangerous substances from the National Emergency Management Training Center and experienced police officers in the field of cargo transport control the Traffic Police Directorate. Furthermore, the implementation process of the conducted training sessions was analyzed, assessing the performance of police officers during real-world incidents following the initial specialized training.

TRAINING IN THE PREVIOUS PERIOD

As Part of Basic Training

In the Ministry of the Interior, the standards of professional training and development are defined and represent a system of rules, procedures and criteria in the implementation of the analysis of the need for training, the development of curricula's, the development of training materials, the delivery of classes, the organization and implementation of training, knowledge verification and evaluation, monitoring and control of the training process and training evaluation in the Ministry of the Interior.[2]

Before the adoption of the above-mentioned curricula, traffic police officers received information about this topic and training through Basic police programs and professional development seminars within our organization or with the support of foreign partners. One of the first steps to a systematic approach to this topic, in the recent past, was the publication of a research study on the topic "Proceedings in controlling the transport of dangerous goods"[3] and its presentation at the Expert Consultation on Fire Protection in Novi Sad held on September 15-16, 2006, organized by The Higher Education Technical School of Professional Studies in Novi Sad, University of Novi Sad. The focus of the study was on safety when controlling the transport of dangerous goods (Đurđević, Gagić 2006) and the actions of police officers in the emergency.

Professional training in the Ministry of the Interior, in addition to other forms, is realized through basic police training and specialist training.[4] In the curricula, the legal competences and obligations of the Ministry of the Interior, as well as the knowledge and conclusions obtained on the basis of the experiential and empirical process, are implemented. In accordance with the above, the paper's content was implemented as a professional curriculum both for participants of Basic police training (regular police forces of general jurisdiction) and in the Professional Curriculum for participants of basic police training for the position of a traffic policeman, Nº 01639/23-13. Both trainings are conducted at the Center for Basic Police Training in Sremska Kamenica. The instructors are professionals with long-term experience in the field of traffic police work. Particular importance is attached to the

2 Article 2. Regulation on Professional Training and Development in the Ministry of the Interior

3 The work was prepared by the author of this professional work in cooperation with the current head of the Fire and Rescue Units Directorate

4 Article 13 paragraph 3 Regulation on Professional Training and Development in the Ministry of the Interior

fact that the teachers are certified and trained to apply the principles of andragogy. Classes are held in groups of up to 30 students. In the program content, topics related to dangerous goods are processed through two modular units. As part of the Module: Road traffic safety - Counter sabotage protection, the topic "Dangerous goods" is covered in 3 lessons of cargo classes, including: Explosives (commercial and military), Gunpowder and pyrotechnic mixtures, Inflammable substances and agents, Radioactive substances and agents, Toxic substances and agents, and Biological agents. After the last lesson, the participants are expected to be able to define the term 'dangerous goods', list the types of dangerous goods and explain their characteristics (explosives - commercial and military, gunpowder and pyrotechnic mixtures, flammable substances and means, radioactive substances and agents, toxic substances and agents, biological agents). From the domain of skills, to: recognize explosives, gunpowder and pyrotechnic mixtures. From the domain of adopted attitudes: to understand the importance of recognizing and distinguishing dangerous substances. Within the Module: Road Traffic Safety through the Modular Unit "Traffic Regulation and Control of Traffic Participants", participants are directed towards acquiring the skills to carry out control of the regularity and possession of the necessary equipment in the vehicle, especially for trucks and buses by applying knowledge and the ability to explain the importance of controlling trucks and buses.

Within chapter IV, under the title "Narrower professional module - Control and regulation of traffic" through modular unit number 7: Special types of traffic control within one theoretical lesson and one intended for practice (the assignment focuses on the topic of "Control of vehicles transporting dangerous goods") after which the participants are expected to have the knowledge to state the concept of dangerous goods and the classes into which they are classified according to their properties, as well as to have the basic skills to control vehicles that transport dangerous goods.

Through Professional Development and Conditioning of Knowledge and Skills

The professional development of members of the Ministry of the Interior is planned and implemented in accordance with the Professional Development Program and within other forms of professional development.[5] The Regulation on professional training and development in the Ministry of the Interior defines that professional training is organized and implemented within the Ministry through permanent and additional training, as well as through professional meetings and study visits. It represents the continuous improvement and development of acquired as well as the adoption of new knowledge, skills and attitudes, which resulted from practice, scientific research work or new normative arrangements of certain areas, with the aim of legal, efficient and safe performance of work. Bearing in mind that no organization can be absolutely independent and have such wide capacities, certain contents of professional training are realized outside the Ministry of the Interior in cooperation with other state bodies, domestic and foreign legal entities.

Accordingly, based on the experiences gained and the stated needs of the organizational units of the Ministry of the Interior during 2016, in accordance with the Professional Training Program for Police Officers of the Ministry of the Interior for 2016 (No 01-11374/15-8), four seminars were organized on the topic "Police Officer Actions in the Case of Chemical Accidents in transportation of dangerous goods". The purpose of these seminars was to enable the acquisition of new knowledge about dangerous substances. They aimed to elevate the skills and promote safe behavior among members of the Ministry of the Interior, particularly when intervening in accident situations. A total of 120 police officers from the traffic police and general jurisdiction police attended the training.

5 Article 13 paragraph 3 Regulation on Professional Training and Development in the Ministry of the Interior

During 2019, the training of members of the traffic police was organized at the international level - The TAIEX Project. The training was carried out in Belgrade in the period from May 20 to 24, 2019, with road traffic inspectors from the Ministry responsible for traffic from the Republic of Poland presenting their experiences. The participants became familiar with: the definition and conditions for transporting dangerous goods; the classification and classes of specific conditions and rules for the use of packaging; the requirements concerning vehicle construction and the approval, just as with the practical training in the application of ADR regulations during inspection supervision and so on. Thanks to this training, members of the traffic police became better acquainted with the topic and relevant issues. Subsequently, more frequent controls of road users were initiated at various locations across the Republic of Serbia.

Curriculum for the Control of Road Traffic Participants Who Transport Dangerous Goods

In the Ministry of the Interior, professional training is organized, in addition to other types, as basic police training and specialist training. As previously mentioned, the basic police training aims to train participants for the legal and efficient performance of the duties and tasks of a uniformed police officer, at the workplace of a police officer, a police officer for community work or a police officer for a specific area of work.[6] With the aim of increasing efficiency and effectiveness in the performance of tasks within the competence of the Ministry of the Interior, specialist training is conducted through which police officers acquire knowledge, skills and attitudes necessary for the competent performance of police and other tasks in a certain area of work of the Ministry, as well as additional knowledge, skills and attitudes[7].

The increase in safety requirements in the transport of dangerous goods is gaining importance (Sremac, Matijašević, 2021) taking into account that, at the global level, more and more attention is being paid to potential risks to people and the environment. Recognizing the importance of the matter, as well as the obligation arising from the Law on the Transport of Dangerous Goods with regard to the Professional training of police officers, the Traffic Police Directorate included this type of training as a mandatory part of the Training Plan in the Ministry of the Interior for 2022 in the form of specialist training.

In order to comply with the obligations of the Ministry of the Interior, the prescribed steps were implemented. The head of the National Emergency Management Training Center at the time took care of the application of professional training standards regarding the development of the subject training program. An analysis of the need for training was undertaken, in accordance with the main part of the analysis plan, the implementation of the necessary phases, i.e. the determination of the current state - the level of knowledge, skills and attitudes of employees and the knowledge, skills and attitudes necessary for the competent performance of tasks and tasks of members of the traffic police during the control of participants in the transport of dangerous goods. The tasks of the analysis of the need for training were considered, the target group was determined through the analysis of the results achieved after the training in accordance with the Professional Training Program for Police Officers of the Ministry of the Interior for 2016 and 2019. In addition to the above, an interview was conducted with the management of the Traffic Police Directorate and experts and Safety Consultants for Transport of Dangerous Goods from the Serbian Oil Industry, based in Novi Sad. Through the interview, the expected time and availability of members of the traffic police and the possibility of taking them

6 Article 32 Regulation on Professional Training and Development in the Ministry of the Interior
7 Article 83 Regulation on Professional Training and Development in the Ministry of the Interior

out of regular working hours were considered. And all in terms of a clearer picture of security from the perspective of economic entities over which control is exercised.

Bearing in mind that the subject training represents the implementation of the subject training, the content of the Law on the Transport of Dangerous Goods was considered. Special attention was paid to the analysis of the Curriculum for work on interventions with dangers goods Nº 01 1632/17 and the results of the 20 classes of trainings implemented under the aforementioned program. In response to emergency with the participation of dangerous goods that may occur intentionally or unintentionally, the role of all subjects of the security system in the country is significant, proportional to the scope of the event and risk. According to the conclusions of the study "Preparedness of emergency and rescue services for responding to CBRN threats due to the use of dangerous substances" (Đurđević, 2016), the role and tasks of members of the traffic police in cooperation with members of the fire and rescue units in the case of emergency situations involving dangerous goods were analyzed.

RESULTS OF THE ANALYSIS IMPLEMENTED IN THE TRAINING CONTENT

Before submitting the draft program for adoption by the Minister, the consent of the head of the organizational unit for human resources affairs and the General Police Directorate was obtained. During 2020, the Minister of the Interior adopted the Curriculum for the controlling of road traffic participants who carry out the transport of dangerous goods, Nº 01 - 6136/20. This curriculum equips participants with essential knowledge, basic skills, and the necessary attitudes required for efficient and effective performance in controlling dangerous goods.

The outline and content of the Curriculum is prescribed by the Regulation on Professional Training and Development in the Ministry of the Interior. The subject program is intended for police officers who control road traffic participants. The goal of the Curriculum is to enable the training of police officers to successfully control road traffic participants transporting dangerous goods.

As an expected general outcome after the implementation of the Curriculum, the police officer is trained to apply the acquired knowledge about dangerous substances and dangerous goods. The officer applies the acquired knowledge regarding the normative regulation of the transportation of dangerous goods on the territory of the Republic of Serbia. They recognize the content and dangers of the transported goods. In accordance with the recognized risk, the application of protection and safety measures when working with dangerous substances and, in the event of an emergency, they apply the knowledge and skills in dealing with emergency in the transport of dangerous goods and adequately coordinate other relevant services participating in the response to the emergency.

From the domain of knowledge, the expected specific outcome is the ability to define the concept of dangerous goods and dangerous substances, having knowledge of which normative acts regulate the transport of dangerous goods in the Republic of Serbia, then how many types of dangerous goods there are, and what are the characteristics of dangerous goods according to the classification of the International agreement on the transport of dangerous goods, the so-called ADR. It also involves recognizing the different markings used in the transport of dangerous goods. The trainee has basic information about the mode of action of dangerous substances and accordingly recognizes what measures need to be taken to ensure an adequate response. Possessing the knowledge of defining distances for initial isolation and implementation of protective measures towards endangered persons and goods as well as participants in the process of responding to an emergency is set as a precaution.

From the domain of skills after the completed training, the expected specific outcome is the ability to independently exercise control over participants in road traffic carrying out the transport of dangerous goods, as well as the application of methods of securing the place of occurrence of emergency in the transit post of dangerous goods; the ability to plan and organize work, both personal and small-group work in emergency events with dangerous goods; the ability to successfully prepare for intervention - visual observation; information gathering and event reconnaissance. For the purpose of personal protection, the officers learn how to adequately use the available protective equipment and independently use the "Emergency Response Guide".

From the domain of attitudes, the expected outcome is the application of professional standards in work and developing a proper attitude towards work through communication with co-workers and citizens. This behavior confirms the work of the police and the importance of the police in protecting citizens and property. They are to show self-confidence and safety when controlling participants in road traffic who carry out the transport of dangerous goods. Trained officers possess and develop a responsible attitude towards one's own health and the health of others. They collaborate with team members and act as part of a team and review attitudes and changes based on facts.

The duration of the training is defined by the curriculum, that is, the training is realized in a total duration of 40 classes, i.e. 5 working days. The training lasts a maximum of 8 classes a day, and one class lasts 40 minutes. It is planned that the training will be realized within the framework of theoretical and practical (modular) teaching. Theoretical teaching is carried out with all the participants of the training together in groups of 16 participants, and the practical teaching is carried out by the instructors with each participant individually, in groups of up to 4 students. It is indicated that the teaching in the training is realized in an appropriate teaching environment with the use of teaching and other means that meet all the conditions for the realization of teaching in the manner provided by the program content of the training and the didactic and methodological instructions, that is, by the provided teaching methods.

The trainees are expected to complete the full fund of teaching hours. A participant who is absent from classes for justified reasons is excluded from the training, with the right to attend it with the next group of participants, if such a request is sent from the organizational unit of the Ministry where the participant is employed.

Teaching Staff

The Curriculum, in accordance with the above-mentioned Regulation, defines that the classes are realized and performed by trainers, instructors and experts from the subject field of training. Trainers are employees of the Ministry trained for independent planning, preparation and delivery of lessons, in accordance with the principles of adult learning. Instructors are employees of the Ministry, who conduct classes in order to develop the practical skills of employees who have completed appropriate training in the subject area in which they conduct classes. The curriculum recognizes the possibility that experts from the subject, modular or thematic area outside the Ministry can be hired as teachers.

Entry Criteria for Trainees

In accordance with the vision of the Traffic Police Directorate, the content of the program envisages that police officers who control road traffic participants will be sent to the training.

Recommendations for the Implementation of Teaching

Implementation of teaching is prescribed, which indicates that the process of teaching at the training should be focused on the trainees, so that they are enabled to control the process of acquiring knowledge and skills. Through interactive teaching and work in small groups, in accordance with lesson plans, the participants have the opportunity to immediately apply what they have learned in the control of participants in road traffic, which is carried out by the transport of dangerous goods. At the beginning of the training, an assessment is foreseen to check the amount of knowledge that the trainee has before the start of the training.

The training consists of lectures/exercises, a part intended for checking knowledge, practical training and correlation of theoretical and modular teaching. Teaching is carried out in accordance with the principles of adult teaching and learning, using teaching methods that include case study, modified lecture, demonstration and simulation.

Theoretical teaching and modular lectures in the elaboration of practical exercises are carried out with all course participants together or using the e-classroom, and practical teaching in the control of participants in road traffic involved in the transport of dangerous goods, is carried out by the teachers of the course with each participant individually.

As prescribed by the Regulation, at the end of the specialist training, the acquired knowledge and skills are checked and the evaluation is carried out - the final test is given as a form of checking the competence of the trainees. Competence check - the final exam, is realized by a test, that is, a practical demonstration of competence - a check of practical work.

The final test is carried out in front of an examination committee formed by the head of the organizational unit for training tasks at the suggestion of the training manager and composed of teaching staff, a representative of the Traffic Police Directorate and a representative of the organizational unit responsible for human resources management.

The trainees are deemed to have successfully completed the test, if they answer 60 percent of the questions correctly, and the practical test, if they met all the criteria - steps in the procedure or methodology in the control of participants in road traffic carrying out the transport of dangerous goods. Instruments for checking include: a test for self-assessment of knowledge, test for checking knowledge and tasks with lists with defined criteria - steps in the procedure or methodology of work for checking practical work, prepared by the examination committee. The trainees will be assessed descriptively: "passed" or "failed". If the trainees are assessed as "passed" during the check, they will be considered to have successfully completed the training. Also, it is foreseen that the trainees who are assessed as "failed" during the test, within a period of not less than one month and not longer than three months, will be referred only once for re-test. If the trainee is rated as "failed" on the re-test, it will be considered that he/she did not successfully complete the training, which the training manager will report to the organizational unit from which the trainee was sent to the training.

It is planned that trainees who successfully complete the training pass the final test receive a Certificate of Completion of Professional Training from the head of the Police Training Directorate, will be handed a certificate of successfully completed training for the exercise of control over participants in road traffic carrying out the transport of dangerous goods by head of the Police Training Directorate.

Bearing in mind that even today the training program cannot meet all requirements, the evaluation and eventual modification of the program was foreseen if the evaluation established a need as well

as in the cases of passing new regulations or adopting new standards in work. In the content of the curriculum, through 7 teaching units of theoretical education consisting of 16 classes, the following topics are covered:

- Dangerous substances - dangerous goods
- Normative regulation of the transport of dangerous goods
- Marking of means of transport and packaging of dangerous goods
- Recognizing the risk of dangerous goods
- Protection and safety measures during the control of participants in road traffic, which is carried out by the transport of dangerous goods and the security of persons
- Procedure for controlling participants in road traffic carrying out the transport of dangerous goods
- How to proceed in the event of an accident in the transport of dangerous goods.

Through the modular part of the program content, 3 modular units are covered in 22 lessons on the procedure for controlling participants in road traffic, transporting dangerous goods and securing the scene of a traffic emergency in the transport of dangerous goods.

The first modular unit is the Simulation of tactical tasks involving the control of participants in road traffic carrying out the transport of dangerous goods and the security of the scene of a traffic accident in the transport of dangerous goods.

The second modular unit is Tactical exercises for the control of participants in road traffic carrying out the transport of dangerous goods, and the third modular unit is Tactical exercises for securing an emergency event during the transport of dangerous goods.

The following topics are covered through the teaching units:

- Teaching units "Dangerous goods": Definition of dangerous goods, Classification of dangerous goods and Definitions of classes of dangerous goods (from 1st to 9th grade)
- Teaching units "Regulation of dangerous goods transport**":** National regulation of the transport of dangerous goods, International regulations on the transport of dangerous goods, Competence in the controlling of the transport of dangerous goods and Documentation for the transport of dangerous goods.
- Teaching units "Marking of means of transport and packaging of dangerous goods":
- Danger sheets of dangerous goods, Signs for marking dangerous goods in transport, Factory marking of finished products containing dangerous goods, and Mixed transport of dangerous goods.
- Teaching units "Recognition of the risk of dangerous goods": Basic elements and methods of identifying dangerous goods in transport and at the scene of an accident, Databases of hazardous goods and Application of the "Accident Response Guide".
- Teaching units "Protection and safety measures when working with dangerous goods": Mode of action of dangerous goods, Types of toxic action of dangerous goods on the human body, Method of intake and action of toxic substances, Ionizing radiation, Factors that are important when deciding on protective measures.
- Teaching units "Proceedings during the control of participants in road traffic carrying out the transport of dangerous goods": Basic principles and elements of actions during the control of participants in road traffic carrying out the transport of dangerous goods. Control of the driver of the means of transport with dangerous goods, Control of the means of transport used to transport dangerous goods, Control of documentation during the transport of dangerous goods

and Detection and documentation of economic offenses/ misdemeanors and sanctioning of participants.

– Teaching units "How to act during an emergency in the transport of dangerous goods": Statistical data on extraordinary events in the transport of dangerous goods, Basic principles and elements of action in the event of an extraordinary event in the transport of dangerous goods, Securing the scene and the measures aimed at securing the scene of an extraordinary event and Calling the competent authorities to take further measures in accordance with the emergency.

Through the modular units (exercises), the following topics are covered: Tactical exercise of control over participants in road traffic who transport dangerous goods in real-world conditions, Tactical exercise of dealing with emergency events (traffic accidents and other events) on the road and Case study of controlling the participants in road traffic that carry out the transport of dangerous goods and the case study of arresting persons at the scene of an emergency in the transport of dangerous goods.

ORGANIZATION AND IMPLEMENTATION OF TRAINING

As defined by the above-mentioned Regulation, for the needs of other lines of work in the Ministry, this training is organized and implemented by the Police Training Directorate. Bearing in mind that it is implemented for the needs of members of the traffic police, the subject training is implemented in cooperation with the Traffic Police Directorate. A Training Implementation Plan is prepared for each class. Adoption of the plan in question is preceded by the adoption of the annual Plan for specialized training in the Ministry of the Interior in that year and the definition of the necessary funds for its implementation. Funds are understood as funds for the provision of teaching materials according to the Plan of Material, Technical and Financial Resources for Training (Form 7)[8]. The training implementation plan contains the elements that are given in the Instructions for the preparation of the training implementation plan (Form 6)[9]. The training implementation plan more closely regulates the way of training implementation. The plan determines the following:

– Place, time and duration of the training,
– Training participants, including the training manager, deputy training manager, training organizer, teaching staff, trainees and possibly other engaged persons,
– Organization of testing - checking of acquired knowledge and skills,
– Rights and obligations of participants,
– Organization of accommodation, food and transportation for the training staff - Material, technical and financial resources,
– Organization of medical security,
– Organization of security affairs,
– Monitoring the implementation of the training,
– Conducting evaluations,
– Defining the assignment of certificates,
– Planning of eventual evaluation, and
– Method of reporting.

8 Regulation on Professional Training and Development in the Ministry of the Interior
9 Regulation on Professional Training and Development in the Ministry of the Interior

An inspection of the Technical and Financial Resources for Training for the implementation of the first 9 classes of the training has established the planned annual costs. Estimated funds include the cost of purchasing teaching materials and providing food for the participants. The expenses in question do not include compensation for the teaching staff, as they are engaged in the so-called work assignments. The accommodation of participants is in the facilities of the Ministry of the Interior, so the cost is not included. Based on the above, it is estimated that the training for one student for the Ministry of the Interior amounts to 6,875 RSD.

HANDBOOK FOR TRAINEES

Professional training standards provide that each participant should have an adequate handbook for trainees. The handbook is a teaching material intended for trainees in order to achieve the intended program outcomes[10] and is made according to the prescribed standards for its technical editing[11].

In accordance with the standards, an adequate cover illustration was designed for the manual. In order to make it easier to use, the contents are listed at the beginning of the manual. Each teaching unit in the manual contains the objective and outcomes of the teaching unit. The teaching units, designed in the chronological order and in accordance with the program, bring about and nurture the expected attitude about the need for professional training in this area.

The teaching unit "Dangerous substances - dangerous goods" is elaborated through subheadings: Definition of dangerous goods and Definition of classes of dangerous goods.

The teaching unit "Regulation of the transport of dangerous goods" is elaborated through subheadings: Processing of national legal regulations for the transport of dangerous goods; International regulations on the transport of dangerous goods; Jurisdiction in controlling the transportation of dangerous goods, and Documentation for the transportation of dangerous goods.

Teaching unit "Marking of means of transport of dangerous goods and packaging of dangerous goods and additional risk" is dealt with through the subheadings: Risk sheets of dangerous goods; Marking boards; Mixed transport; Factory labeling of finished products containing dangerous goods, and Other types of risk labeling of dangerous goods.

The teaching unit "Recognizing the risk of dangerous goods" is elaborated through the subheadings: Basic elements and methods of identifying dangerous goods in road transport and at the scene of an emergency; Databases and Emergency Response Guidebook**.**

The teaching unit "Protection and safety measures involved in the control of participants in road traffic carrying out the transport of dangerous goods and the security of persons in the place of emergency" are covered through the subheadings: Ways and effects of dangerous goods; Types of toxic effects of dangerous goods on the human body and method of intake; Ionizing radiation, and Protective equipment.

Teaching unit "The way of acting during the supervision of road traffic participants who carry out the transport of dangerous goods" is more closely explained through the subheading: Basic principles in the conduct of the supervision of road traffic participants who carry out the transport of dangerous goods.

The teaching unit "Method of action during an emergency in the transport of dangerous goods" is elaborated through the subheadings: Statistical data on emergency in the transport of dangerous goods;

10 Article 12. Regulation on Professional Training and Development in the Ministry of the Interior
11 Form 4. Regulation on Professional Training and Development in the Ministry of the Interior

Basic principles and elements of handling during an emergency in the transport of dangerous goods; Securing the place and security measures during an emergency in the transport of dangerous goods, and Calling the competent authorities to take further actions in accordance with the emergency.

The Handbook was designed to facilitate interactive learning and is very user-friendly, enabling trainees to acquire necessary knowledge. Since the trainees receive the guidebook for personal use, it serves as a lasting reminder.

In order to make it easier to use what is presented in the manual through the teaching units, corresponding illustrations have been implemented in accordance with ADR. The presentation of the transport of mixed dangerous goods is particularly simplified. The schematic representation of the positioning of the relevant subjects of the System for responding to emergency on the scene is expressed very vividly and allows for easy memorizing.

The instructional units are aligned with the curriculum, guiding trainees chronologically toward an informed perspective on the need for professional competence in this field. In addition to the mentioned guidebook, trainees also receive additional work material as a supplementary teaching tool. The material represents scripts made by security advisors in the oil industry of Serbia. The material in question is the product of the latest experience in transport by this company. The teaching supplements are the result of experience in the transportation of dangerous goods and cargo. These materials are invaluable aids in enhancing trainees' capabilities.

REALIZED TRAININGS

In the period since the adoption of the training program, and in accordance with the training implementation plans, 14 courses were held with a total of 224 police officers as training participants.

Place of Implementation of the Training

The theoretical teaching is carried out at the "Avala" Teaching Center - an environment designed for optimal knowledge and skills transfer. Accommodation and meals in the center are provided for all participants. Practical training occurs at the "Belgrade -Vrčin" toll plaza on the highway (state road IA, order A1).

Persons Who Are Engaged for Teaching

For the training's implementation, experts with more than twenty years of work experience in the organization of security in the transport of dangerous goods, monitoring and control of participants in the transport of dangerous goods, as well as preparation, planning and organization of response to extraordinary events involving hazardous materials, were assigned. All engaged teachers have the skills to apply the principles of andragogy. Distinguished experts in the relevant field were engaged, both from within and outside the Ministry, in the sense that this involved the representatives from the Ministry of Construction, Transport, and Infrastructure, as well as from the company "Oil industry of Serbia J.S.C. Novi Sad". A special emphasis in the training, often delivered by former and current employees of the National Emergency Management Training Center, was given to safety measures and recognition of the risk related to transportation of dangerous goods.

Trainees

The Traffic Police Directorate, in accordance with the already recognized importance, proportionally to the workload and according to the planned activities, assigns police officers from the regional police administrations to work at the executive level. Police officers with experience in controlling road traffic participants in accordance with the Law on Road Traffic Safety, tachograph control, etc., are appointed. It should be noted that the trainees of the 1st class were participants of the intermediate and operative level of leadership. Through the above-mentioned interview, interlocutors from the Traffic Police Directorate pointed to the implementation of the planned construction of an adequate organizational system within the Administration itself, which will be in charge of the subject area of work.

Applied Didactic-Methodological Approach in Training Implementation

In the course of training implementation, the program is divided into the theoretical teaching (lectures), the practical teaching (exercises), and the knowledge assessment segment. The training adheres to anagogical principles and adult learning methodologies, so that participants are empowered to take an active role in acquiring knowledge and skills independently.

The practical component of the training for traffic police officers takes place in real-world conditions-specifically, on the Belgrade-Niš highway at the "Beograd-Vrčin" toll plaza.

Participants directly encounter real individuals involved in the transport of dangerous goods. The advantage here is that this segment is done in smaller groups (from 2 to 4 participants per job position), allowing each trainee to take on the role of a controller.

If we take the theory of readiness that Cvetković (2020) explains with a theoretical point of view that is used as a framework to explain how the community changes and how it changes in terms of readiness for prevention, in this case the prevention of chemical accidents in transport, we must take into account the potential risks to life in the event of a chemical incident during transportation, traffic police officers responsible for controlling road participants undergo specialized training to apply safety measures effectively, using the newly-acquired knowledge and skills. From the report on events (Form ID 1), which is kept for each emergency event by the Fire and Rescue Units within Directorate of the Sector for Emergency Situations, it can be stated that at each emergency event with dangerous goods and in connection with the transport of dangerous goods, there is the presence of members of the traffic the police. From the above-mentioned report on emergencies, a significant fact can be observed that the members of the traffic police reported the emergencies. They were on regular traffic control tasks at the time of the emergency. Out of the total number of reports, 95% of emergencies were reported by members of the traffic police. This fact indicates that they are the ones who are the first to be exposed to the incident. Together with members of the fire and rescue units, they play a crucial role in preventing the spread of effects and consequences. Due to the life-threatening nature of chemical incidents that can occur during transportation, police officers who control traffic participants must undergo specialized training for implementing safety measures. As indicated in the preface of the translation "Emergency Response Guidebook 2016" (Đurđević 2017) this guidebook serves as a basic guideline for safe response to incidents and informs about the actions of all participants. Bearing in mind the quality of the aforementioned guide, it was implemented as part of the training implementation.

The Emergency Response Guidebook**:** A Guidebook for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Transportation Incident (ERG) is used by emergency response personnel (such as firefighters, paramedics and police officers) in Canada, Mexico, and the

United States when responding to a transportation emergency involving hazardous materials. First responders in Argentina, Brazil, and Colombia have recently begun using the ERG as well. It is produced by the United States Department of Transportation, Transport Canada, and the Secretariat of Communications and Transportation (Mexico). The first iteration was published by the United States Department of Transportation (USDOT) in December 1973, as Emergency Services Guide for Selected Hazardous Materials.

In the Republic of Serbia, members of professional fire and rescue units have been using the "Emergency Response Guidebook" since 2009. Financial support for the translation and printing of the manual entitled "Emergency Response Guidebook 2008" was provided by AD "Methanol vinegar complex" from Kikinda and "Victoria Group" SCR from Novi Sad, and the same was translated by the Ministry of Environment and Spatial Planning, Department of control and supervision.

As for the "Emergency Response Guidebook 2016", which is currently in use, financial support for translation and printing in 2017 was provided within the framework of the international CBRN project P44 "Strengthening of first response capabilities to chemical, biological, radiological and nuclear (CBRN) substances, threats and regional cooperation in Southeast Europe, South Caucasus, Moldova and Ukraine" organized by the European Commission and the United Nations through the Center for Excellence consortium. The coordinator of translation and distribution was the head of the National Emergency Training Center at the time, the creator of this study.

Testing the Level of Acquired Knowledge and Skills

The realization of the specialist training was followed by an assessment the level of acquired knowledge and skills; complex tests taken before the examination committee were used to check whether the participants had adopted the expected level of knowledge and skills. So far, all the participants who attended the subject training have successfully completed the final test. Checking the level of acquired knowledge is carried out for the purpose prescribed by the training program and is also used in the evaluation of the quality of the training. It has already been indicated that at the beginning of the training, the amount of knowledge that the trainee has before the start of the training is assessed through the so-called entrance test. Then, after the theoretical classes, a phase test is conducted and at the end of the course a final test it taken. Satisfactory success in the implementation of the training can be assessed through the reports on the training. On the entrance test, trainees gave correct answers to an average of 52% of the questions. That is, the lowest result was 35% and the highest was 70%. All trainees successfully passed the planned phase test. It is highly commendable, as seen in the training reports, that an average value of 87.5% was achieved on the final test. That is, the lowest result was 75% and the highest was 100% of the questions. The achieved results indicate a significant success in the level of skills of the training participants after the training. In addition, the stated result indicates the quality of teaching. All trainees received a Certificate of Completion of Professional Training from the Police Training Directorate.

Work of Police Officers After Training

During the preparation of the final specialist thesis (Đurđević 2015) at the specialist studies of the University of Criminal Investigation and Police Studies, by looking at the statistical data of the National Association of Oil Companies of the Republic of Serbia, it was determined that the transport of dangerous goods (beyond stationary systems like gas pipelines and oil pipelines) indicate that transport on the territory of the Republic of Serbia is in accordance with the transport worldwide. Specifically,

63% of transportation occurs via road, 10% via rail, 27% via water, and a mere 0.1% via air. Members of the traffic police perform daily vehicle controls, particularly during international initiatives like those organized by ROADPOL. These efforts are aimed, among other things, at the control of cargo vehicles transporting dangerous goods, including those that transport goods on territory of the Republic of Serbia, within the Republic of Serbia or transiting. Controls are carried out with the inspectors of the relevant Ministry of Construction, Transport and Infrastructure, and other subjects responsible for supervising and controlling dangerous goods.

On average, in accordance with the Annual Reports on Emergency Events (Report ID2) which are kept by the Fire and Rescue Units Directorate, Ministry of the Interior, in the previous 10 years, members of the Ministry encounter approximately 80 technical interventions involving hazardous materials. Technical intervention with dangerous substances is the intervention of the fire-rescue unit at extraordinary events that occur at facilities and systems for the production, storage, transport and distribution of dangerous substances. Most of these incidents occur with traffic vehicles, accounting for approximately 37.09%. Specifically, technical interventions related to dangerous goods primarily take place in road transport (52.41%), followed by railway transport (46.9%), river transport (0.69%), and air transport (0.45%).

The assessment of training success and the attainment of projected preparedness levels in the field of transporting dangerous goods involve comparing the outcomes with the consequences observed after the response of competent services. Notably, when we compare the mentioned number of emergency incidents involving dangerous goods with the total number of emergency incidents on the territory of the Republic of Serbia in which fire-rescue units on the territory of the Republic of Serbia intervene, we come to the conclusion that about 1.54 incidents occurred per week in the previous 10 years with a growing tendency. Over the last two years of training for controlling participants in road transport of dangerous goods, no recorded incidents escalated into catastrophic consequences. A certain number of trainees participated in several events related to the transport of dangerous goods, both for emergency and in the process of successful control of students in the transport of dangerous goods. In the previous period, there was no evaluation of the implemented trainings in the working positions of the trainees. Workplace evaluation analyzes the impact of acquired knowledge and skills on work after the training. The reaction of the trainees at the mentioned events is satisfactory, and it can be said that the impact of this training is unequivocally evident.

It is necessary to recall the tank car derailment and the ammonia leakage incident that occurred on December 25, 2022, along the Niš - Dimitrovgrad main track, between Pirot and Staničenje. One person died (a foreign citizen - a truck driver who stopped to see what had happened) and 51 citizens reported to the hospital due to symptoms of poisoning. The release of ammonia into the atmosphere resulted in two traffic accidents on the state road 1A, row A4. In one traffic accident, 7 passenger vehicles were involved (4 people were injured), while in another traffic accident, property damage occurred involving a single vehicle. Despite these multiple events, the swift and organized response by the members of the Ministry of the Interior prevented much larger number of casualties and facilitated the unhindered movement of goods and people along alternative routes.

Furthermore, it is essential to highlight the improved efficiency in controlling actors involved in the transportation of dangerous goods. An illustrative event that occurred at the Preševo toll booth on state road 1A, row A1, in the direction of the Preševo-Niš border crossing. A convoy of vehicles – a tractor and a trailer 3 tanker – bearing registration numbers from Serbia, were halted. The cargo being transported consisted of diesel fuel (UN 1202) totaling 30,618 liters. The carrier was a domestic com-

pany, while the recipient of the goods operated within Montenegro, with the final delivery destination being Sisak, Croatia.

The control revealed numerous irregularities under the Law on Transport of Dangerous Goods and serious violations of the provisions of the Law on Road Traffic Safety, namely:

- The driver did not have a driver's license, i.e. it had been suspended due to negligent and improper driving by a decision dated March 21, 2012, issued by the Police Directorate in Valjevo;
- The driver had not been issued an ADR certificate;
- The validity of the ADR certificate had expired on the cargo vehicle (tractor);
- The incorrect CMR documentation (the name of the dangerous goods to be transported was not entered);
- The tank trailer did not have a periodic inspection document.

Liability measures were taken against the driver in accordance with the law and the relevant

Ministry of Construction, Transport and Infrastructure was informed.

Finally, we will explore the event on state road 1A, row A1, at the border crossing Preševo (entering the Republic of Serbia). A set of vehicles (tractor and trailer-tanker), with Serbian registration plates was controlled. The driver, a citizen of the Republic of Serbia, possessed additional documents from other countries. The dangerous material was being transported - fuel for UN 1863 jet engines. The carrier and recipient of the goods was a domestic company, while the goods were sent from the territory of the Republic of North Macedonia, and the place of delivery was the Republic of Serbia. However, serious violations of the Road Traffic Safety Act were identified:

- The driver holds a driver's license issued by the authorities of the Republic of Croatia.
- An ADR certificate was issued by the authorities of the Federation of Bosnia and Herzegovina.
- The driver possesses a professional driver's card (CPC) issued by the authorities of the
- Republic of Slovenia.
- Further investigation revealed that the driver was subject to an active ban on driving a motor vehicle for the category he was operating for 8 months.
- Additionally, the driver's license issued by the authorities of the Republic of Serbia was invalid by decision and confiscated.

Liability measures were taken against the driver in accordance with the law and the relevant Ministry of Construction, Transport and Infrastructure was informed.

FINDINGS/CONCLUSIONS

The old saying stating that "a chain is only as strong as its weakest link"[12] aptly applies when assessing the system's readiness to manage the transportation of dangerous goods within its territory. This intricate system involves various entities: legal representatives within organizations, individuals responsible for handling goods during loading and unloading, and those managing the actual transport. At the administrative level, international bodies ensure compliance with regulations governing dangerous goods transportation.

12 The phrase "A chain is only as strong as its weakest link" or similar variations are often attributed to the philosopher Thomas Reid, who was known for his 18th-century works on human cognition and perception.

As recognized by Cvetković (2020), in the expert literature on disasters, very little attention is given to researching the role of intervention - rescue units in different phases of disaster response - preventively (before the event), during and after the disaster. In addition to regular action, police actions depend on the type, intensity, consequences, but also the level of training, skills and equipment, and consistency of plans and procedures for engagement and action.

In order for the system to show the best results, which is the delivery of goods to end users without unexpected and unwanted events - emergency incidents, every part of the system and each person participating in the transport process must undergo adequate training. This paper presents the training of members of the traffic police whose task is to control participants in the transport of dangerous goods in road transport.

We can freely conclude that the competent Ministry started the training of members of the traffic police in accordance with the norms that define the field of training in the Ministry. Through the analysis of the training results realized before the preparation of this curriculum, the expressed needs and capacity of the Traffic Police Directorate and the obligations of the traffic police according to the norms that define the transport of dangerous goods, a quality curriculum was created. In the teaching content of the program, all obligations defined by both laws and by-laws are implemented. It can be considered that cooperation was carried out very successfully through the teaching content - combining the work of the police and firefighters, rescuers in the event of an accident. It was also indicated that it is a large content and that, as such, it deserves a special course, that is, that it cannot be adequately conveyed in a small fund of lessons as it was given in the basic training. It is noticeable that when defining the number of hours, the expected time for processing the content and the availability of police officers were balanced.

The handbook for training participants was created with the aim of facilitating easier navigation and interpretation of the regulations governing the transport of dangerous goods and the international ADR agreement. The content of the manual represents a significant relief in the work of police officers of the traffic police who, after completing the training, will control vehicles and drivers, that is, participants in road traffic who carry out the transport of dangerous goods. Bearing in mind the growing trend of extraordinary events with dangerous goods, it is necessary to update the statistical data in the subject manual on an annual basis. A significant number of courses and seminars on this topic are organized at the international level. It is necessary to consider and include, if deemed useful, the conclusions reached at the mentioned international trainings and seminars. Implementation of new knowledge, regardless of whether it was created through an experiential knowledge cycle or a processed conclusion made after experiments. After the interview with the participants of the training, the practical exercises in the control process, as well as the simulation of the response to emergency events with dangerous substances, were pointed out with the highest attention. Working in real conditions increases the level of adopted and accepted new knowledge. Working in groups of 2 to 4 participants enables greater concentration of the participants on the topic being discussed. The training program provides for the possibility of processing the theoretical content through distance learning, the so-called e-classroom. This method would enable more adequate preparation of the trainees for passing the phase test and greater readiness for practical exercises.

The described training program effectively covers essential topics, providing officers with the necessary knowledge and skills. The methods for knowledge transfer, skill development, and fostering the right attitudes contribute to achieving program goals.

Results from police officers' responses during dangerous goods transport control and handling of emergency confirm the training's quality and underscore the need for ongoing education. Three critical factors contribute to the success of traffic police training:

1) Regulatory Knowledge: The trainees demonstrated an adequate level of adopted knowledge of regulations in the field of dangerous goods transport. This was demonstrated through the results of the test and during the simulation of the control of participants in the transport of dangerous goods.
2) Direct Action: The application of the acquired knowledge and skills in the real conditions of the simulation of the controlling of participants in the transport of dangerous goods and actions in the assumed emergency is presented.
3) Synergy: The trainees, through the affective domain, achieved a positive attitude about the necessity of cooperation between entities involved in road traffic control in order to increase overall safety. This was especially noticed in the course of the simulation and solving of tactical tasks in the process of control and emergency.

These factors not only impact road safety but also safeguard lives, protect valuable cargo, and preserve the environment.

ORIGINALITY/VALUE OF THE PROCESSED ACTIVITY

The Traffic Police Directorate has significantly increased its capacity for controlling road traffic participants who transport dangerous goods. Recognizing the importance of this specialized training, the Traffic Police Directorate insists on including it in the annual training plan.

The originality and value of this endeavor lie in raising awareness across the transport system. By acquainting all stakeholders with police training processes, we emphasize the state's commitment to effective and functional development. Recognizing each participant's role in achieving maximum quality ensures that the entire system fulfills its purpose.

Furthermore, practical training prepares trainees to apply their knowledge immediately. While adequate equipment is crucial, true preparedness stems from awareness of real risk and comprehensive training for all security personnel and relevant actors involved in handling hazardous goods.

In order to improve the process of training future trainees, it is necessary to carry out an evaluation of the work positions of the previous trainees and implement the conclusions in the training curriculum. As one of the conclusions, one can doubt the real costs of the trainings, that is, look at the possibility of adequate motivation of the engaged trainers for the implementation of the training.

ABOUT THE AUTHORS

The work was created by the joint effort of several authors, namely:

– Police Colonel Dejan Đurđević, with 24 years of experience in various management positions – from the fire brigade to head of the National Emergency Management Training Center, Colonel Đurđević specializes in property and personal protection. His familiarity with disaster management processes and CBRN post-use procedures is extensive. As a trained teacher-trainer within the OSCE Mission in Serbia, he has contributed significantly to safety and readiness. Notably, he

translated the "Emergency Response Guidebook 2016" enhancing the Ministry members' ability to respond effectively to chemical, biological, radiological, and nuclear threats.

- Police Colonel Slaviša Lakićević, Head of the Traffic Police Directorate and Safety Consultant for Hazardous Materials Transport; with many years of work experience in supervising road traffic participants who carry out the transport of dangerous goods.
- Police Colonel Sergej Uljanov, Chief Inspector for Business Process Improvement and Coordination in the Lines of Work II at the Traffic Police Directorate and Safety Consultant for Hazardous Materials Transport; Manager of specialized training for traffic police officers overseeing participants in road traffic engaged in hazardous materials transport and a lecturer at the aforementioned training with many years of work experience in this field.
- Police Lieutenant Colonel Ivica Stanković, Head of the Traffic Control and Regulation Department within the Traffic Police Directorate, Safety Consultant for Hazardous Materials Transport. His commitment to professional development includes leadership training at the International Law Enforcement Academy (ILEA) in Budapest. He also serves as a lecturer in the Specialist Training for Traffic Police and the Training for Supervision of Road Traffic Participants Transporting Dangerous Goods.

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THE ROLE OF OUTLAW MOTORCYCLE CLUBS IN ORGANIZED CRIME WITH AN EMPHASIS ON MOTORCYCLE CLUBS IN THE NORDIC COUNTRIES

Olgica Vulević, PhD student[1]
Ministry of Interior of the Republic of Serbia

INTRODUCTION

Outlaw motorcycle clubs have recently become the target of positive legislation, police forces and secret services of many countries, and for this reason they have become a threat to the safety of the social community.

This activity is rhetorically based on organized outlaw motorcycle clubs (hereinafter referred to as OMCG) as participants in organized crime, although most of the media coverage of the public refers to public violence to which the same gangs are prone. In connection with the above, regardless of what their focus really is, members of these groups have a lifestyle that intimidates the public (Lauchs & Jarrod, 1: 2017).

THE HISTORY OF OUTLAW MOTORCYCLE GANGS, THEIR ORIGINS AND CULTURE

Motorcycle gangs have a rich and controversial history, dating back to the middle of the 20th century. Their formation is often linked to social changes, wars and subcultures that developed after the World War II. Many veterans, returning from war, were looking for a way to adjust to civilian life. Motorcycles became a symbol of freedom and rebellion, and veterans formed groups that shared a common love of riding motorcycles. The first organized outlaw motorcycle clubs (motorcycle gangs) appeared during the 1940s and 1950s.

Outlaw motorcycle clubs are a cultural phenomenon that originated in the United States of America and spread throughout the world, first in Western countries, and gradually in all other developed regions. Their male members were increasingly enamoured with powerful American motorcycles, especially those produced by *Harley Davidson.* A chain of historical events created a model of organizational type that provided an outlet for their preferred lifestyle and specific organizational structure. One of the most famous outlaw motorcycle clubs, *the Hells Angels,* was founded in 1948 in California. This outlaw motorcycle club soon became synonymous with violence and clashes with the authorities, which attracted media attention and contributed to the creation of the myth of "outlaw" motorcycle clubs. *The Hells Angels* became the model for many other groups that emerged throughout the United States and the world.

The genesis of OMCG is generally said to have taken place in the small Californian town of Hollister during the July 4th holiday weekend of 1947 (Reynolds, 1967:43). *The San Francisco Chronicle* reported that motorcyclists "began to 'take over the city' on the evening of July 3rd... and were practically out of

1 olgicavulevic@gmail.com

control"; that they "defied all traffic regulations by rushing at full speed through the streets and intersections"; and that they directed "their machines into bars, smashing appliances, bottles, glasses, tables and mirrors". While most of the bikers were in Hollister that weekend attending an unsanctioned American Motorcycle Association (AMA) event, a section of them broke away and split up. OMCGs like *the Booze Fighters* and *Pissed Off Bastards of Bloomington* stood out from the mainstream motorcycle enthusiasts and created an authentic rebellious subculture. Such groups began to enjoy their minority status and would soon identify themselves as outlaws or "1% people"; the few who are not concerned about the rules of society (Lauchs & Jarrod, 2017:1).

THE SPREAD AND EVOLUTION OF OUTLAW MOTORCYCLE CLUBS

The outlaw motorcycle club was made up of ex-soldiers, where the original outlaw clubs practiced a military lifestyle (Reilli, 2009:11), and where their members felt alienated from a safe and secure lifestyle. During the 1960s and 1970s, motorcycle gangs expanded internationally. Groups such as *Mongols MC, Outlaws MC, Bandidos MC and Pagans MC* became known for their organization and violent clashes with rival gangs. In many cases, these gangs engaged in criminal activities, including drug trafficking, extortion, violent crime and arms trafficking.

While OMCGs were formed in the conservative post-war period, the countercultural environment of the 1960s proved to be the incubator in which OMCG grew and began to spread throughout the world. At the forefront were *the Hells Angels* in California. Under the leadership of Ralph 'Sonni' Barger, *the Hells Angels* incorporated the military structure of the OMCG and became highly organized (Lauchs & Jarrod, 3:2017). Motorcycle gangs were not only criminal organizations, they were also a subculture with specific rules, symbols, customs and rituals. Members of these groups often wore specific vests with emblems (known as *colours*), which indicated their affiliation with a particular motorcycle gang.

CONFLICTS WITH THE AUTHORITIES, MUTUAL CONFLICTS AND MEDIA ATTENTION

The book *Hell's Angels: The Weird and Horrible Saga of Outlaw Motorcycle Gangs* (Thompsons, 1966) became a current classic that inspired rebellious youths to join outlaw clubs. *The Hells Angels* then collaborated with film companies to shape and present the image of bikers and set themselves as his example. Virtually all OMCGs around the world use the structure and rules of the *Hells Angels club* as their model. Despite the great distances in their locations, these groups maintain a considerable degree of uniformity in their outward appearance and their activities. All outlaw clubs support a hierarchical structure that is most often represented by a president, vice president, sergeant major and secretary and/or treasurer. They forbid riding Japanese motorcycles and most often prefer *Harley Davidson* motorcycles. They (almost universally) wear three-part patches on their backs (Lauchs & Jarrod, 2017: 3). Their notoriety was the focus of society, media, books, and movies.

Motorcycle gangs were often in conflict with the authorities but also with each other. Violent confrontations between rival groups, known as *"biker wars"*, often ended in death. These conflicts attracted a lot of media attention and led to motorcycle gangs being perceived as a serious threat to public safety. One of the most famous incidents happened in 1969 at the *Rolling Stones concert* in Altamont, where *the Hells Angels*, hired as security, killed a concertgoer. This event marked the end of the "peaceful" era of the counterculture of the 1960s and further degraded the image of motorcycle gangs in the public eye.

Since the mid-1990s, the Hells Angels have become openly antagonistic towards all clubs over which they have no indirect influence. This led to a subculture war that pitted the *Angels* against other major clubs across North America, Australia and Europe. They had structural sophistication and a great desire to achieve that goal even though *the Mongols* were on the rise. Conservative bikers wanted to preserve conservative values (Quinn & Forsyth, 2011: 217).

CHARACTERISTICS OF OUTLAW MOTO GANGS

OMCG members have historically shown a contradictory notion of freedom. While they enjoy their freedom from mainstream society, including obligations such as marriage (Wolf, 1991:18), they have a military system of obedience and commitment to the club, including strict observance of participation in club events and adherence to dress codes. Club members, therefore, struggle to find work and turn to petty crime for income, but many manage the conflicting obligations of the club, main job and family (Veno, 2012:7). Despite these members playing conforming and deviant roles, Barker (2007, 2011:15) notes that the behaviour patterns of OMCG members are designed to conflict with mainstream society and therefore attract the attention of state authorities.

Motorcycle gangs, especially those labelled as "outlaw" or "one percent" groups, have several distinctive features that distinguish them from other subcultures and criminal organizations. These features are key to understanding their structure, behaviour and how they function.

OMCGs are honour-based societies that reflect the principles of the criminal subculture, which include notions often supported by mainstream society, such as honesty and trustworthiness (Newbold, 1989:11). The two primary forms of foul play—committed by other clubs—are fouls against club colours and trespassing on club grounds. Conversely, honour can be gained within one's own club by committing these same acts against opposition clubs (Lauchs & Jarrod, 2017: 4-5).

During the 1980s, the expansion of the clubs led various US government agencies to focus on their illegal activities (Hopper & Moore 1983; Montgomery, 1976: 338). OMCG has become recognized by US law enforcement as "the new face of organized crime" (Barker & Human 2009:175). Barker points out that the American OMCG is connected with large organized criminal groups, such as the Russian, Colombian, Asian and Italian mafias (Barker, 2007:44). Stolz states that the police often claim that OMCG behave like organized criminal groups fighting over the territory where they will carry out their racketeering (Stolz, 2015:18).

Brand and image are marketable goods that increase their power (Quinn & Koch Shane, 2003:299). In other words, the fear generated by traditional activities is a tool that supports radical organized criminal activity. Therefore, the clubs may not have been founded as organized crime groups, but they have adapted by building on their inherent strengths.

OMCG has a history of inter-club violence or war mentality. They compete for territory out of the need for prestige and in order to protect the same territory, also to receive new members (Quinn & Forsith, 2011:220). This competition led to feuds such as the four-decade-long rivalry between *the Hells Angels* and *the Outlaws* in the US (Quinn & Forsyth, 2009:260) and the blood feud between *the Hells Angels* and *the Mongols* (Barker, 2011:201). However, these disputes have existed for decades and do not require any involvement in organized crime to fuel them. Since territorial disputes are part of the original psyche, they are not proof that OMCG is a criminal enterprise.

Most motorcycle clubs in New Zealand today do not function as organized crime groups, but have elements of organized crime within them and often include members who work with outsiders (Gilbert, 34: 2013). That the clubs are not criminal organizations, but that the members of the groups engage in such crime is also true for Australia (Veno, 2012:56).

Some of the characteristics of outlaw motorcycle clubs are:

Hierarchical structure (OMCG members usually have a strict hierarchical structure that defines the roles and responsibilities of the members). At the head of the moto gang is the president, who makes key decisions, and below him are the vice president, the treasurer (in charge of finances), the secretary (who keeps records), and sergeant-at-arms (who maintains discipline). Members are often divided into groups or branches (local sections), which have a degree of autonomy but still answer to central leadership). Group identity and symbols are the most recognizable aspects of bikers' symbolism. They usually wear vests with emblems (known as *colours*) that indicate gang membership. These emblems include the gang's name, logo, and often the location of the branch. Symbolism also has great importance within a subculture and represents identity, loyalty, and belonging to a group.

Outlaw culture (many motorcycle gangs identify as "outlaw" groups, meaning they pride themselves on breaking the law and operating outside the boundaries of legal and socially accepted norms. These gangs are often referred to as "one percent" groups, which refers to the idea that 99% of bikers are law-abiding, while 1% of them are outlaws. This "outlaw" culture involves rejecting social norms, respecting one's own rules, and often being antagonistic towards the authorities. Other characteristics are loyalty and brotherhood, violence, a rigid code of conduct, rituals and ceremonies, territoriality and connection to a subculture.

OUTLAW MOTORCYCLE CLUBS AND SERIOUS CRIMINALS

OMCG are often associated with serious crimes, which has contributed to their reputation as a dangerous and violent group. Although not every motorcycle club is criminal, many so-called "outlaw" or "one percent" gangs have a long history of involvement in serious illegal activities.

Drug trafficking is one of the most common activities associated with motorcycle gangs. Many of these groups are involved in the production, distribution and sale of narcotics, including methamphetamine, cocaine and marijuana. These activities often bring significant profits to the gangs, but also lead to violent conflicts with rival groups and authorities.

According to Barker, the violent reputation of OMCG members—as a tool of intimidation—is very pronounced (Barker, 2011:212). Motorcycle gangs are also associated with extortion and racketeering. In many cases, gang members use threats of violence or actual violence to coerce individuals or businesses into paying "protection" or giving money to the gang. This type of crime often targets local entrepreneurs, but can also involve wider racketeering operations at a regional or national level. Furthermore, violence is another significant characteristic of motorcycle gangs, especially when it comes to conflicts with rival gangs. These conflicts, known as "biker wars", often result in physical attacks, shootings and even murders. Violence between gangs often escalates over territorial disputes or control over lucrative criminal activities such as drug trafficking or racketeering.

Contributing to more serious forms of crime raises the bar from street crime to more sophisticated activity such as high-level illegal drug sales, racketeering and extortion (Lauchs & Jarrod, 2017:7). Motorcycle gangs are also known for their involvement in the illegal arms trade. These groups often

smuggle weapons, sell them to other criminal organizations, or use them in their own operations. Arms trafficking not only increases the power and influence of a motorcycle gang, but also contributes to their ability to engage in violent conflict with rival groups or oppose public authorities. Like many other organized crime groups, motorcycle gangs use money laundering to legalize their illegal income. This includes investing in legitimate businesses, such as bars, motorcycle shops and other businesses, to disguise the origin of money earned from criminal activities. Money laundering allows outlaw motorcycle clubs to expand their operations and maintain financial stability and compactness.

The presence of motorcycle gangs can have a serious impact on local communities. Fear of violence, extortion and other criminal activities often leads to destabilization of the social community. In some cases, motorcycle gangs establish "parallel authorities" where they impose their own rules and laws instead of official institutions.

OUTLAW MOTORCYCLE CLUBS AND ORGANIZED CRIME

Criminal groups and organizations are taking increasingly sophisticated and organized. approaches to committing crimes, prosecution authorities have increasing difficulties in discovering, elucidating and proving crimes (Vulević, 2024:7). A more successful attempt at definition appears in Article 2 of the UN *Convention against Transnational Organized Crime,*[2] which defines an organized criminal group as: "a structured group of three or more persons who exist in a certain period of time and act in concert with the aim of committing one or more *serious crimes or offenses* established in accordance with this convention with the aim of obtaining, directly or indirectly, financial or other material benefits" (UN Convention against Transnational Organized Crime, 2000). Motorcycle gangs, especially those called "outlaw" or "one percent" groups, are often associated with organized crime.

Organized crime is a growing societal problem that causes serious damage to society, ranging from economic costs, health problems, and a negative impact on victims (Levi et al., 2013: 22). Organized crime, especially in connection with the criminal offenses of drug abuse, illegal trade in arms and people, is on the rise. The number of the most serious crimes committed is growing, and the difficulties in discovering and proving the execution of those crimes and the perpetrators are very great due to the increasingly perfect organization of criminal associations (Vulević, 2023: 3). These gangs are not just social groups that share a love of motorcycles; many of them function as complex, hierarchically organized criminal organizations that engage in a variety of illegal activities. Their structure, organization and mode of operation often make them important players in the world of organized crime.

The nature of organized crimes is different. They include serious criminal acts in corelation with psychoactive substances such as production, supply or trade drugs, extortion, laundering money, prostitution.

Quinn and Koch Shane developed a typology of biker crime. This includes spontaneous expressive acts, that is, one or more members engaging in violent crime within the club, not as part of organized crime activity; *planned aggressive actions,* i.e. anti-rival activity planned by groups within a branch or senior management of a branch or club to advance the club's priorities and current affairs, then *short-term instrumental actions,* i.e. planned or spontaneous activities of members to take advantage of an opportunity (such as theft) and *ongoing instrumental enterprises,* i.e. planned, a long-term activity designed to bring profit to the club. Organized crime falls into the last of these categories (Quinn & Koch Shane, 2003).

2 https://www.unodc.org/

Wolf (1991) addressed this issue and distinguished between *conservative* 'bikers', who preserve the original culture of the club or what we call barbaric behaviour - uncivilized violent hyper-masculinity - and radical 'bikers', who are interested in profit through criminal activities.

During the 1980s, the expansion of the clubs led various government agencies to focus on their illegal activities (Montgomery, 1976: 333, Hopeer & Moore, 1983: 60). OMCG has become recognized by US law enforcement and positive legal regulations as "the new face of organized crime" (Barker & Human, 2009: 175). Wolf defined the OMCG as a "pre-adapted tool of organized crime" because they had a military-style organization supported by strict discipline and an exclusive culture that put the interests of the club above the interests of the community. The outcome of this culture is a demand for absolute secrecy about club events and contempt for the needs of mainstream society, especially respect for the law. It could be added that the fact that these are clubs of violent young men, intimidation in organized criminal markets contributed to these characteristics (Wolf, 1991: 266).

Brand and image are symbols that increase their power (Kuinn et al., 2003). In other words, the fear generated by traditional activities is a tool that supports radical organized criminal activity. Therefore, the clubs may not have been founded as organized crime groups, but they have adapted by building on their inherent strengths.

HIERARCHICAL STRUCTURE AND ORGANIZATION

Motorcycle gangs often have a strict hierarchical structure reminiscent of a military or paramilitary system. At the head of the motorcycle gang there is usually the president, below whom there are the vice president, treasurers (persons in charge of finances), secretaries, and captains or sergeants in charge of maintaining discipline. Members are often divided into groups, with each group having its own specific tasks. This organizational structure allows the gangs to effectively plan and carry out their criminal activities, including drug trafficking, racketeering, money laundering and other illegal operations. In large gangs, such as *the Hells Angels, Bandidos* or *Outlaws*, there is a global network that connects local groups with a central leadership, thus enabling the coordination of activities on an international level.

ECONOMIC POWER THROUGH CRIME

Motorcycle gangs often gain enormous economic power through their involvement in organized crime. The illegal drug trade is one of the most important sources of income for many motorcycle gangs. The production and distribution of methamphetamine, cocaine and other narcotics brings enormous profits, which are further used to finance other criminal activities or for legalization through money laundering. In addition to drug trafficking, many gangs are also involved in other types of crime, such as arms trafficking, vehicle theft, extortion, racketeering and human trafficking. These activities often involve complex operations that require high coordination and cooperation between different groups within the motorcycle gang as well as with other criminal organizations.

ALLIANCES AND CONFLICTS WITH OTHER CRIMINAL GROUPS

Motorcycle gangs often form alliances with other criminal organizations, such as mafia families, Latin American cartels or street gangs. These alliances allow motorcycle gangs to expand their operations, gain

access to new markets or resources, and protect themselves from rival groups. However, alliances are not always stable, and conflicts between gangs or between gangs and other criminal groups can be very dangerous and violent. These conflicts often involve armed confrontations, murders, and other forms of violence, which further complicates the security situation in the regions where these gangs are active.

MONEY LAUNDERING AND LEGAL INVESTMENTS

Money laundering is a key component of organized crime, and motorcycle gangs are very adept at this activity. Money earned from criminal activities is often invested in legitimate businesses, such as bars, clubs, motorcycle shops or real estate. In this way, the gangs manage to hide the origin of the money and legalize it. This practice not only allows gangs to maintain financial stability, but also allows them to expand their influence in the community. Legal investments allow gangs to legitimize themselves in the eyes of the public and authorities, which can provide them with additional protection from the law.

RELATIONS WITH THE AUTHORITIES AND CORRUPTION

Motorcycle gangs often try to influence local authorities and officials through corruption, threats or infiltration. Through bribery or other forms of corruption, gangs can secure information about police investigations, get more favorable treatment in the courts, or even direct government action against their rivals. In some cases, gangs establish close ties with local politicians or businessmen, thereby further strengthening their influence and ability to avoid legal consequences for their activities. These relationships between organized crime and the authorities further complicate the fight against motorcycle gangs and their criminal influence.

Findings about the disproportionate involvement of OMCG members in crime, and even the criminogenic effect of OMCG members, still do not justify the conclusion that the criminal behavior of individual OMCG members is orchestrated by a criminal organization. It is very possible that members of the OMCG commit a crime in their own name, without the organizational role of the OMCG (Sjouke van Deuren, 140: 2023).

MOTORCYCLE GANGS IN THE NORDIC COUNTRIES

Motorcycle gangs in the Nordic countries, such as Sweden, Norway, Denmark, and Finland, represent a significant security challenge, especially due to their involvement in organized crime and their connections to international criminal networks. Although the Nordic countries have relatively low crime rates compared to some other parts of the world, the presence of motorcycle gangs and their association with serious crimes are becoming increasingly prominent problems.

The Nordic countries have witnessed the proliferation of international motorcycle gangs, such as *Hells Angels, Bandidos* and *Outlaws.* These gangs, which developed their roots in the USA and Western Europe, have established branches in all the Nordic countries. The expansion of these groups is usually accompanied by violence, conflicts with rival gangs and an increase in criminal activities, including drug trafficking, extortion and money laundering.

One of the biggest challenges accompanying the presence of motorcycle gangs in the countries is the conflicts between rival groups. These conflicts often involve armed attacks, arson, and other forms of violence, which pose a serious threat to public safety. For example, in Denmark during the 1990s, the so-called *"Nordic gang wars"* between *Hells Angels* and *Bandidos*, which resulted in numerous deaths and great material damage.

ORGANIZED CRIMINAL ACTIVITIES OF OMCG IN THE NORDIC COUNTRIES

Motorcycle gangs in the Nordic countries are linked to a variety of criminal activities, including illegal drug trafficking, extortion and racketeering, arms trafficking and money laundering.

- *Drug trafficking:* Motorcycle gangs control the distribution of narcotics, especially amphetamines, cocaine, and marijuana. Their operations often involve complex international networks that use the Nordic countries as transit points or as end markets.
- *Extortion and racketeering:* Motorcycle gangs often use violence or threats of violence to extort money from local businessmen or other criminal groups. Racketeering is common in nightclubs, bars and the construction sector.
- *Arms trafficking:* Nordic gangs are involved in arms trafficking, often using networks that stretch across borders to illegally import or export weapons.
- *Money Laundering:* Moto gangs use a variety of mechanisms to launder money, including investing in legitimate businesses, false invoicing and using complex financial operations.

LEGAL AND POLICE STRATEGIES IN THE NORDIC COUNTRIES

The Dutch Nordic countries have developed various legal and police strategies to counter the threat posed by motorcycle gangs. These strategies include Specialized Police Units, as well as legal measures. Denmark, for example, has laws that allow the banning of gang members from gathering in certain places, the closure of their clubs and the confiscation of assets associated with criminal activities and international cooperation (Cubitt et al., 2023: 3).

Faced with the growing concern of the authorities with the criminal activities of the OMCG, primarily violence, the Dutch Minister of Justice and Security announced a multi-directional approach, in such a way as to hinder the criminal behaviour of the members, with the primary goal of focusing on the prosecution of individual members and the closure of the moto clubs (Recommending, House of Representatives, 711-112th US Congress, 2011–2012).

In the 1990s, the Dutch government, inspired by the administrative approach of *Cosa Nostra* in New York, realized that a repressive, criminal law approach to organized crime was insufficient to hinder opportunities for criminal organizations. As a result, it has been emphasized that the responsibility for fighting organized crime and other serious crimes lies not only with the police and the public prosecution, but also with other institutions, such as local governments and the private sector (Fijnaut, 2002: 17). For example, to prevent the importation of drugs through the port of Rotterdam, the Dutch government is currently focusing, in cooperation with private organizations, not only on detecting and prosecuting drug criminals, but also on increasing the number of container checks, improving

the port, security and conducting campaigns for raising the readiness of port employees to report a criminal offense (Staring, Bisschop & Rocks, 2021:177).

OUTLAW MOTORCYCLE CLUBS IN AUSTRALIA AND NEW ZEALAND

In 1960, a young American who had contacts with *the Hells Angels* formed a branch of the group in Auckland, New Zealand (Gilbert, 2013: 5). It was the fourth group and the first outside of California. In 1966, three members *of the Auckland Angels* arrived in Australia, where in 1968 they helped establish a branch in Sydney. The branch, however, was not officially recognized until 1975. At that time, New Zealand and Australia were home to numerous OMCGs formed by rebellious youths (Veno, 2012: 28). It is not specified how many clubs were formed, as only a small part survived either due to lack of support or voluntary or forced closure or transfer to more powerful clubs. However, the clubs were formed in both countries according to the classic American model of outlaw motorcycle clubs. Given these subcultural norms, it is no surprise that, as was the case in the US, OMCG members in Australia and New Zealand were regularly in the media spotlight. But for much of the 1970s and 1980s they were unwanted and regarded by the police with suspicion, but not as members of criminal organizations (Campbell & Campbell, 2010:48).

In 2021, the Australian Crime Intelligence Commission identified 38 outlaw motorcycle clubs currently active in Australia, collectively overseeing hundreds of chapters in every state and territory. Although these clubs have long been the target of police attention, particularly due to their suspected involvement in organized crime, recent high-profile events in Sydney involving the murders of OMCG members (along with other members of criminal organizations) have again drawn attention to conflicts within and between rival clubs (Cubitt et al., 2023: 1).

CONCLUSION

Today, motorcycle gangs are active all over the world. While many of these groups are still associated with crime, there are also a large number of motorcycle clubs that operate purely for the passion and love of motorcycling and have absolutely nothing to do with criminal activity. Motorcycle gangs have become complex organizations with hierarchies, rules and strong internal loyalties. Despite the negative stereotypes, many outlaw motorcycle gangs have managed to integrate into local communities and participate in humanitarian actions, although their past reputation often remains a very heavy burden.

The characteristics of motorcycle gangs are complex and rooted in their culture, structure and modus operandi. While many of these groups are associated with crime, they also represent a subculture with its own values, rituals and symbols. Their organization, loyalty and violence make them powerful and often dangerous actors in society.

OMCG represents a social phenomenon that can exist independently of criminal acts. Nevertheless, they serve as a valuable tool for participation in organized crime, as they offer both the secrecy and the ability to intimidate, which can encourage such activities. Within OMCG, two opposing cultures emerge: one is rooted in hypermasculinity and violence driven by honour and loyalty among clubs, and the other is a radical culture that uses these elements for criminal enterprises. While some state law enforcement agencies claim that all OMCGs are radical, there is a lack of evidence to support this claim.

Motorcycle gangs in the Nordic countries pose a serious threat to public safety and security, due to their involvement in organized crime and connections to international criminal networks. Although the Nordic countries combat these groups through legal, police and social measures, motorcycle gangs remain a significant challenge that requires constant attention and adaptation of strategies in accordance with changes in their operations.

Motorcycle gangs and organized crime share characteristics, especially when it comes to criminal activities. However, motorcycle gangs differ in their subcultural basis, structure, motives and social perception. While many motorcycle gangs are involved in serious crime, their members often see themselves as part of a specific subculture with its own code and way of life, which sets them apart from classic criminal organizations that are driven solely by profit. Motorcycle gangs are much more than just subcultural groups of motorcycle enthusiasts. Their involvement in organized crime makes them significant actors in the global criminal landscape. Their ability to combine violence, economic power, corruption and international operations allows them to operate as powerful and often terrifying criminal organizations. The fight against these gangs represents a serious challenge for authorities around the world, who face the need for a comprehensive and coordinated approach to effectively counter their influence.

Outlaw motorcycle clubs represent a specific security problem, given their connection with organized crime and international networks. Although their presence is not as pronounced as in some Western countries, gangs are involved in serious criminal activities that require the continuous attention of police and judicial authorities. In addition to repressive measures, preventive programs are also important that can help reduce the attractiveness of these groups among young people and vulnerable categories of the population. The relationship between OMCG and serious crimes is complex and often deeply rooted in the history of these groups. Although many motorcycle gangs are organized out of passion and enthusiasm for motorcycles, their involvement in criminal activities such as drug trafficking, weapons, extortion and violence make them a serious threat to public safety. Government responses to this threat vary from strict repression to attempts to rehabilitate and reintegrate members into society, but the problem still remains a challenge for many countries around the world.

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THE SOCIAL CLIMATE OF THE CLOSED PRISON IN ZENICA IN THE PERIOD FROM 1993 TO 2016: A LONGITUDINAL STUDY[1]

Alisabri Šabani, PhD[2]
Faculty of Criminal Justice and Security Studies, University of Sarajevo
Bosnia and Herzegovina

PURPOSE

Social aspects of different environmental systems concerning the individual behaviour have a significant influence on types of behaviour, i.e. differences in behaviour can appear in the same personality in different circumstances.

Systematic quantification of the environment can increase the likelihood of behaviour prediction. Following this lead, Stern (1967) quantified and measured dimensions of behaviour in camps that had a flexible organization. In almost all environmental situations, the behaviour was adapted to the flexibility of the environment.

The fundamental fact, confirmed by research, is that different social climates have different consequences on the behaviour of the same subjects. Rudolph H. Moos and P. Houts (Moos & Houts, 1968) determined that the degree of emphasis on spontaneity and autonomy in psychiatric wards, positively correlated with the initiative of patients, was defined as their participation in successful treatment. Conversely, emphasized aggressiveness resulted in a negative attitude towards treatment and a lack of initiative. Research in the social climate of prisons undertaken by Street, Vintner and Perron (Street, Vintner & Perron, 1966) in six different prisons for juveniles, the treatment goals of whom were oriented towards the relation between obedience - conformity and re-education – development, resulted in conclusion that differences in treatment goals had consequences for staff perceptions of prisoners; then on the perception of the prisoners towards the staff.

The difference between prisons was also emphasized by Erving Goffman (Goffman, 1961), underlining the fact that the relationship between prisoners and staff in a total institution has a different climate, i.e. the latter is defined by authoritarianism. Donald R. Cressey (Cressey, 1965) reviewed prison researches, particularly regarding the differences between treatment orientations and prisons whose primary purpose was incapacitation[3]. It was observed that it was a common assumption that uncooperativeness, loyalty, honesty, aggression and paranoia were traits attributed to prisoners. Deviation is understood as a consequence of something "in" the prisoner. He suggested that many behavioural traits exhibited by prisoners or prison staff could have been the result of the type of organization, rather than the individual. Simply, the diagnosis and explanation of "individual disorder" and "deviant behaviour" of prisoners have to be considered in the organizational context in which the behaviour occurs. In theory, the expe-

1 The research was approved by the Minister of the Federal Ministry of Justice, Sarajevo, by decision number: 04-09-3206/16 of 27.7.2016.
2 asabani@fkn.unsa.ba
3 The length of the sentence is also very important (Ignjatović 2007:233).

riences of prisoners are recognized as elements of reality, as one of the main focuses of interest. For E. Goffman (1961) this reality meets the definition of the total institution of the person in it.

Prisoners' behaviour, and the experience of a closed prison, such as the prison in Zenica is, can therefore be investigated from the point of view of the individual traits of the prisoners and their environment. Due to this fact, the importance of the current environment for human behaviour emerges. From this arises the need to respect the participation of situational, current determinants that shape behaviour. This fact was particularly emphasized by Rudolph H. Moos (Rudolph H. Moos, 1968, 1974, 1975; Moos & Houts, 1968; Moos & Wenk, 1972; Moos & Schwartz, 1972) in a series of papers in which he focused on the research of institutional environments, and he proved that it was necessary to quantify systematically various aspects of the social and physical environment, and to combine them with the individual characteristics of the examinees, in order to predict their behaviour. He defined this approach as a social climate based on two assumptions. First, that the individual environment is a unique entity, and second, that the social climate can be described and quantified. This means that prisons can be researched from the point of view of the quality and quantity of the internal environment as a set of relationships between prisoners and official staff, and with this process the rigidity of social control, the structure of situations and sets of events could be measured. The totality of the observed mutual social relations between the actors within the prison, and the attitude towards the prison as an institution is defined as the social climate. F. Brinc (1985), D. Ajduković and A. Kulenović (1989), S. Bogojević (1991) researched the social climate of prisons, and in the recent period, the works of Lj. Ilijić as well (Ilijić, 2013, 2016, 2017, 2021, Pavićević & Batričević, 2024).

These researches have strengthened the conviction about the necessity to respect the environmental conditions in sociology that go beyond the environment as a given fact. Certain social conditions or realities are articulated through behaviour (Crewe&Liebling 2017:892). That is why the social climate of prisons is considered to be of an important scientific interest (Moos, 1974; Ilijić, 2021; Pavičević, et al., 2024), because it reveals latent relationships, processes and events within the prison community. The universe of variables of the social climate of prisons is stratified, and the most frequent events - variables, from the point of view of prisoners, are repression, disorganization, prison code and deprivation.

The most important aspect of the functioning of the prison community is its social climate, which defines the direction and movement of this community in the complex environment (system) in an effort to explain it, to adapt to it, or to reduce the environment (system) to a factor which will define it as "unjustly condemned" population.

With regard to the subject of this research, we followed the social climate of the prison community in the war and peacetime period.

The following goals are imposed:

1) Determination of changes in the social climate of the prison community, i.e. its subdimensions in the periods 1993, 1994, 1997 and 2016.
2) Determining and analysing the structure and functioning of the social climate of the prison community, and its subdimensions, with an emphasis on 2016 as a normative period in which the peacetime situation dominated (1993 was characterized by a total blockade, 1994 by a partial release, and 1997 and 2016 were characterized by the dominance of peace).
3) Determining which subdimensions of the social climate of the prison are the most stable through the analysis of correlations and multiple correlations.

In addition to the aforementioned research interests, we believe that this approach also makes sense in terms of helping to define the goals of serving the sentence, especially in:

- reduction of violations of institutional rules, especially individual and collective violence within the prison,
- management of security risks in prison,
- creation of re-educational treatment for prisoners in terms of developing competencies that will enable the prisoners to function in civil circumstances (education, problem-solving skills, etc.),
- reduction of recidivism,
- the diagnostic value of the work,
- longitudinal and comparative studies,
- partial indicator of the state of human rights of prisoners in prison.

METHODS

Through a longitudinal approach to this research, we focused on the changes and conditions of the social climate of the closed prison in Zenica in the indicated time periods. As S. Tomanović (2020) says: "Time and change are cultural constructs, but also individually and subjectively interpreted constructs..." (Tomanović, 2020: 10), therefore we want to cover prisoners and their perception of prison in two fundamentally different research periods, i.e. the war period in 1993 and 1994, and the peacetime period in 1997 and 2016.

For this purpose, it seemed necessary to apply the following:

1) The theoretical analysis of the problem, which includes the analysis of concepts, the theoretical framework of behavioural problems, the definition of the situation and the strategy of behaviour of prisoners in prison as a total institution. A person in a closed space in all the points or situations is a conscious and goal-oriented organism (Proshansky, Ittelson, & Rivlin, 1970). In this situational context, individuals and groups, such as prisoners, strive to organize their physical and social environment with the request that the organization include the interaction and exchange (Sabani, 2023) with the environment (institutional and personal aspect). This is precisely the social space in which the social climate of the prison community is mostly engaged in shaping the internal environment of the prison.
2) Empirical non-experimental survey method with a longitudinal dimension was applied to the work, and its choice stemmed from the goal of the research.
3) The statistical method enabled us to observe certain regularities in trends, as well as the statistical significance of the phenomena and features we research. The paper presents the correlation relations between the subdimensions of the social climate of prisons and multiple correlations, while the other indicators are ignored due to the volume of empirical material. Pearson's correlation coefficient *r* shows us the cause-and-effect relation between the subdimensions of the social climate. We used those relations as determinants of the definition of the situation by treated periods and examined groups. We used the multiple correlation *r* for the purpose of analysing the general factor of the social climate of the prison community for certain periods, as well as for the overall observed periods.

The prison community serving the sentence in the Zenica closed prison by definition is fixed in time and space (Walker&Drawve, 2018: 178). Despite this, within the prison there is a multitude of mutual relations and processes that grow out of the specific character of the prison, as well as the psychosocial differences of the prisoners. A set of norms (prison code) that regulate relations inside and outside the community, common interests and a number of other relationships have a different impact on

the community itself. The situation in prison, which consists of both formal and informal parts, their formal and informal differentiation is variable, and it varies under the influence of many external and internal factors, and as such implies multiple simultaneous events. As we mentioned, the most frequent events - variables are the following:

- Repression means the way of "exercising power" in the relationship between the prison community and official staff; it measures the level of supervision, control, and use of force.
- Disorganization measures the amount of disorder within the formal staff of the prison, the ambiguity of treatment and demands towards the prisoners, non-compliance and the breakdown of the system within and between the formal and informal (prison) parts.
- Prison code measures a set of unwritten rules of behaviour within the prison community, as well as the levels of cohesion (Sykes & Messinger, 1960).
- Deprivation measures a set of deprivations in terms of freedom, material values, goods, services, heterosexual relationships, autonomy and safety in prisoners towards other prisoners. Deprivation is a highly subjective feeling, but it is considered to be a collective variable due to the similar experiences of prisoners.

On the basis of these dimensions, the social climate of the prison is the result of the relationship that determines the different degree of presence of repression, disorganization, prison code and deprivation, whereby the difference of the prison into the formal part (repression and disorganization) and the informal part (prison code and deprivation) is respected. Based on this definition, we can consider that the social climate of the prison is the result of the relationship between:

1) official staff and prisoners,
2) prisoners and prisoners,
3) prisoners according to the living conditions in the prison,
4) prisoners according to free time in prison,
5) prisoners according to deprivations[4].

Wenk and Moos (1972) tested several different prisons, the purposes of which ranged from incapacitation (guarding) to treatment procedures that took place in semi-open prisons. They concluded that prisons with a lower degree of supervision and control result in a more favourable social climate inside the prison.

In this sense, we used the revised and adapted CIES (Correctional Institutions Environment Scale Manual) created by Moos (1974) for different types of prisons. He also created form R, which contains 90 items, and form C, which contains 87 items. These forms refer to the following subdimensions:

- quality and intensity of mutual relations,
- the way of encouraging personal development,
- the system maintenance.

The first subdimension reflects the degree of involvement of the members of the institution in what is happening among them, mutual support and assistance, and the degree of spontaneous and open expression of feelings. The second subdimension assesses the degree of autonomy in preparing people to solve practical life problems in the post-penal period and the effort for the prisoner to get to know himself better. The third subdimension deals with the amount of order and organization, the clarity of the day-to-day running of the program and the level of supervision over prisoners.

4 Intense and constant deprivations can cause post-traumatic stress (Cavadino, Dignan&Mair 2013:174)

Based on the method of collecting data and facts, a non-experimental survey method was applied, and the survey technique proved to be the most appropriate, and the instrument contained 39 items in the Likert format[5]. 9 items refer to the repression subscale, 10 to deprivations, 9 to the prison code, and 11 to disorganization. The decisive moment for shortening the instrument to 39 statements was the low educational level of the prison population and reduced ability to concentrate on unusual activity, and fluctuation of attention.

With regard to the goal of the research, the survey technique proved to be the most appropriate. The survey helped to standardize and measure the social climate, and to test the statistical hypotheses regarding the subject of the research.

We used the aforementioned instrument in April 1993, covering 68 prisoners (93.9%) of the total number serving their sentences that year. In April 1994, 74 prisoners were examined, 83.3% of the prisoners were included in the sample. In December 1997, we tested 70 respondents (21.8%). We conducted the research in November 2016 on a sample of 152 prisoners (20.9%). Considering the presented relationships of the sample and the set, it is evident that the samples had all the metric characteristics that are valid for the set as well, and it allows us to generalize the results of the research. All samples include crimes of murder, aggravated theft, robbery and rape. They were all sentenced to over 3 years in prison.

FINDINGS

Starting from the hypothesis that each treated observation period of the prison has its own specific social climate, which is reflected in the different intensity of the presence of the mentioned subdimensions of the climate, we approached the quantitative analysis of the results in order to determine the differences between the periods. We also determined the state of the social climate of the prison in certain periods. As the most economical procedure, we used the Pearson correlation coefficient r.

Table 1. *Overview of the Correlation Coefficient Across the Treated Periods*

Periods Correlations	1993	1994	1997	2016
r DDo	0.44	0.43	0.4	0.37
r DR	0.03	-0.29	0.59	0.38
r DK	0.13	-0.38	0.38	0.2
r DoR	0.12	0.61	0.52	0.14
r DoK	0.06	0.46	0.42	0.36
r RK	0.34	0.7	0.64	0.2

The correlation between the variables in 1993, as far as we can see, ranges from 0.03 to +0.44. The presence of a negligible correlation between repression and deprivation, as well as disorganization and the code, is explained by the fact that these subdimensions have become weak, and that they were completely neglected due to the general state of society. The formal system itself was in considerable existential problems, due to which official duties were neglected. However, the correlation of disorganization and deprivation dominated, and that focus was explained by the fact that main-

5 The prison social climate test, as well as the accompanying documentation, can be obtained from the author for inspection.

taining order in the prison was difficult (Šabani, 1999). All this introduced distrust in officials and significantly affected deprivations in addition to accompanying deprivations related to scarcity, which latently indicated a conflict between formal and informal communities. Disorganization significantly related to deprivation. We explain this fact by the prisoners' observation about the non-functioning of the prison and the inconsistency of treatment. Prisoners perceived their deprivation to be equal to that of formal staff (lack of food, cigarettes, etc.). This deprivation was visible and often expressed in communication, which is why the disorganization gains importance. This resulted in the view that the inertness of the formal community caused the prisoners' deprivation.

The correlation between repression and the prison code maintained statistical significance, which pointed to the conclusion that the conflict between the formal and informal community took place in the direction of the greater presence of repression or its symbols uniting the prison community. As repression was more present, the prison code strengthened. We attribute this to the fact that the classic forms of penal treatment lost their influence in that period (occupational therapy, individual and group work, rewards, etc.). In the given circumstances, and in such a reduced space, the formal system remained recognizable precisely through repression or symbols of repression. The statistically significant correlation between the subdimensions of repression and the prison code ($r = 0.34$) essentially represented a conflict between the formal community, which was the bearer of repression, and of the informal community, which was the bearer of the prison code. The same relationship repeated in the correlation of disorganization (carried by the formal system) and deprivation (carried by the prison community) represented its subjective experience. All other correlations of the subdimensions were not statistically significant, i.e. the formal system did not react to the prison code as an opposite, but they adapted to each other. As we can see, in 1993 there were current processes of confrontation, but also of adaptation, for the reason that the exclusive attitude and reaction of one of the both systems could have ultimately been dangerous and undesirable for both systems.

The interrelationship of subdimensions in 1994 ranges from $r = -0.38$ to $r = 0.70$. All correlations are statistically significant and moderate coverage of the social climate of the prison community is visible. The most obvious connection was between the subdimensions of repression and the prison code, and repression and disorganization. It was clear that repression determined the overall social climate during that period. Repression did not completely cover the space of the social climate of the prison, but it largely determined it independently. Repression was to the greatest extent related to the prison code ($r = 0.70$), which was not surprising due to the fact that those two variables were the most outstanding foci of events (traits) and states (states) in the two basic components of the prison social climate, formal and informal community.

During 1994, the hypothesis was confirmed - as repression increased, the homogeneity of the prison community increased as well. The strong association around the prison code was evident. In that period, this correlation was emphasized, i.e. the basic event was the constant struggle for the functioning of the prison as an institution. At the same time, the growth of repression resulted in the growth of disorganization in 1994, which translated into empirical language meant that the phenomenology of repression was perceived by the prisoners as the absence of order, uniformity of actions and fulfilment of the obligations of the formal system. The bearers of this correlative connection were the formal system, which in 1994 changed the direction of its action in the direction of resistance to prisoners, and not as in 1993 in the direction of adaptation to prisoners. That turn from adaptation to resistance was the reason for this significant connection, which the prisoners evaluated as disorganization. The correlative connection observed between disorganization and the prison code meant that the growth of disorganization supported the stability of the prison code. Within the disorganized state of the prison, that meant that space was opened for the prison code. Disorganization was also significantly related to

deprivations, and we associated it with the fact that the formal system was in a position to make important decisions about prisoners, which was especially related to making decisions about parole or external benefits. The prisoners considered the formal system responsible for the increase of deprivation. In that period, deprivations were negatively associated with repression and the prison code. Deprivation increased the dependency of prisoners, which had the negative impact on the prison code, as well as on repression. The experience of deprivation obviously could not be reduced within the prison code.

During 1997 (peacetime period), the social climate of the prison community was decisively determined by the connection between repression and the prison code, which could also be explained by the conflict between the formal and informal community. The normalization of the function of the prison caused a conflict between the formal and informal community[6], and it seemed that that conflict was constant and permanent, and that belongs to the attributes of this type of prison. Even in 1997, the focus of events was on the relationship between repression and the prison code (r = 0.64), meaning that there was a direct confrontation between the formal and the prisoner (informal) community. The conflict between the formal and the prison community was visible in correlation of repression and deprivation (r = 0.59). As an additional indicator of the contrast between the formal community and the prison community, there was a correlation of disorganization and repression (the carrier of the formal system). The subdimensions of deprivation and the prison code, which referred to the prison community, were significantly more correlated with each other, which could have been explained by the fact of the character of the peacetime era, i.e. that prisoners could alleviate deprivation much more easily in this period than before, and because of that they exercised less alternative mitigation in the prison code. The relationship between the formal and the prison parts, such as the correlation of disorganization and the prison code, as well as deprivation and disorganization, had moderate saturation and did not stand out as foci of the social climate of the prison community.

In 2016 the interconnection of the subscales was not uniform, but it was evident that the strongest links were repression and deprivation, followed by the prison code and disorganization, and deprivation and disorganization. Other subdimension relationships did not show stronger relationships. Those findings were not surprising because repression and deprivation remained structurally the most important elements of the overall social climate. Those elements had the greatest influence and to a certain extent independently determined the relationships with other variables. The subdimensions of the prisoner code were significantly related to disorganization, which confirmed the view that the prisoner community was deeply divided into two groups, because one part of the sample within the group often committed disciplinary violations and they believed that they had been unjustly disciplined (Šabani, 2024). The second group was pro-socially oriented and had an interest in following the rules in order to realize their rights, such as the use of external benefits and the possibility of reducing the length of the sentence (Šabani, 2023). Deprivations, as an essential part of the essence of punishment, were also significantly linked to disorganization because prisoners believed that the formal system did not sufficiently enable the reduction of deprivation. As we can see, all the most significant connections of the subdimensions defined the social climate through two basic components of the prison, formal (official prison staff) and informal (prisoners). We explain the low correlations between the variables related to prisoners, deprivations and the prison code by the inhomogeneity of the prison community and opposite value orientations[7]. During 1997, the social climate of the prison community was decisively determined by the connection between repression and the prison code, which could be also explained by the decisive conflict between the formal and informal community. It seemed that that conflict was constant and permanent and belonged to the attributes of this type of

6 Some aspects of this conflict can be called SCP (situational crime prevention) because the dynamics of this conflict are often unpredictable (Bowers&Johnson 2016:111).

7 It has been noted that the same treatment can have different consequences for the prisoner (Loughran & Mulvey 2011:165).

prison, as we have mentioned before. The focal point in 1997 were the events related to repression and the prison code (r = 0.64), i.e. there was a direct confrontation between the formal and informal communities. The conflict between the formal and the informal community was visible in the correlation of repression and deprivation (r = 0.59). As an additional indicator of the contrast between the formal and informal community, there was a correlation of disorganization and repression. The subdimensions of deprivation and the prison code, which referred to the prison community, were significantly more correlated with each other, which could have been explained by the fact of the character of the peacetime era. The prisoners could alleviate deprivations much more easily in that period than before, and therefore, the alternative mitigation in the prison code was less exercised.

The relationship between the formal and prison parts, such as the correlation of disorganization and the prison code and deprivation and disorganization, has moderate saturation and does not stand out as foci of the state of the social climate of the prison community.

In order to determine to what extent the results on certain subtests were related to the entire test result, we calculated multiple correlations R[8] by placing each subtest specifically in the position of the dependent variable.

Table 2. *Multiple Correlations of the Subdimensions of the Social Climate of the Prison Community Through the Treated Periods*

Period R	1993	1994	1997	2016
D. DoRK	0.46	0.54	0.60	0.78
Do. DRK	0.43	0.67	0.54	0.65
R. DDoEK	0.45	0.73	0.69	0.66
K. DDoR	0.35	0.87	0.65	0.60

We treated a single subdimension as dependent in relation to other subdimensions as independent, and obtained the following results.

From the multiple correlation coefficients in 1993, it was evident that all dimensions of the social climate equally covered space, except for the prison code. We can say that the situation in the prison was determined by an equal amount of repression, disorganization and deprivation, which meant that the situation in the prison was not differentiated, and it was not recognizable to express the centre of events or subdimensions that would be decisive in relation to the others, but they were balanced.

In the course of 1994, the prisoner's code gained importance, covering not only most of the universe of variables of the social climate of prisoners, but also repression. They almost equally marked the climate in that period. The prison code imposed itself as a general factor in the social climate of that period. During that period, the prison code imposed itself as a general factor in the social climate of the prison community followed by repression.

During 1997, repression and the prison code also proved to be the most significant factors of the social climate, which suggested a permanent conflict between formal and informal communities and was actually an extension of the quality of the social climate from 1994.

8 For multiple correlation, the symbol R1.234 is used, where 1 indicates the dependent variable, and the other numbers indicate the independent variables under whose influence we examine the dependent variable.

In 2016 we determined that the first-order factor was the perception composed of deprivation. That was best explained by the following items of the prison social climate test:

- Officials are the personalities who should be especially respected,
- I can hardly bear the denial of information about what interests me,
- I have a hard time not being able to be alone with my wife or girlfriend whenever I feel the need.

Repression was imposed as the second factor, which was best indicated by the results on the following items:

- The guard service uses physical punishment too often,
- Applications for disciplinary violations are filed even for the insignificant trifles,
- In this prison, it is not possible to talk to officials in a human way,
- Disciplinary penalties imposed on the disciplinary report are too severe,
- I can hardly stand what others decide on behalf of me when I will eat, sleep, walk, work and the like,
- Officials control prisoners too much,
- Officials enjoy humiliating prisoners.

Disorganization and the prison code also significantly defined the social climate of the prison, but to a lesser extent.

The greatest variability during the entire period was shown by the prison code and repression tended towards a stable and significant presence within the social climate, which was not surprising considering the type of prison. In general, we can say that the subdimension of repression had the greatest significance, so that it could be also spoken of as a general factor of the social climate of the prison community. At the same time, it appeared as the most powerful instrument of formal staff in treatment strategies towards the prison community. Deprivation constantly increased their participation in the overall definition of the prison social climate as the areas of prisoners' human rights expanded, as well as the growing need for consumerism.

ORIGINALITY/VALUE

The originality of the work is reflected in the fact that the social climate of a closed prison was measured in the samples of the mentioned periods, and that the findings could have been used for comparative research conducted in other prisons. The research of this type could be used for creating more humane functioning of prisons, especially in terms of managing security risks in prisons, creating re-educational treatments and reducing recidivism.

We tried to specify the structural and functional differences of the prison community in the domain of social climate as a dynamic aspect of those changes. The dynamic of changes was monitored and operationalized through the varying intensity of the presence of deprivation, disorganization, repression and the prison code in the period from 1993 to 2016. The tested periods adequately indicate different qualitative conditions or environments not only in prison, but also in society.

The results show that the most important elements of the social climate were deprivation and repression, and almost throughout the entire observed period they had a dominant role in creating the social climate that made up the formal and informal system. It appeared that the relatively stable functional conditions of the environment contributed to this mutual support of the subdimensions of the social

climate of the prison community. They discriminated well between research periods from the point of view of the prison community. The prison code showed the greatest variability and it most often depended on special prisoner groups that achieved their actualization in relation to prisoners who were prone to multiple disciplinary violations and had given up on the prison treatment goals in relation to them. Disorganization, as part of the prison reality, adapted to the main events in the prison and its presence mainly depended on repression and deprivation.

In this regard, the point of view in the domain of the existence of the prison community was confirmed in the sense of Sykes and Messinger's statement that: "It is necessary to pay more attention to the social environment in which the prison population has to live with the problems that this environment creates. We want to know why the prison community is there, and also how the prisoners maintain it", (Sykes&Messinger, 1960:12).

The hypothesis of the existence of the social climate as a specific entity through which it is possible to analyze the states and traits of a group, such as a prisoner group, was also confirmed. We hope that we have succeeded in proving that these are real and empirical, and not hypothetical constructs of the prison community and its social climate.

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INTERNET RADICALIZATION AND THE POSSIBILITY OF SPREADING RADICAL IDEAS AND MATERIALS ON THE DARK WEB

Marjan Nikolovski, PhD[1]
Davor Arsic, MSc
Faculty of Security – Skopje, University "St. Kliment Ohridski" in Bitola
North Macedonia

INTRODUCTION

Technological development in the last few decades has been in constant growth and improvement. Society cannot be imagined to function normally without the use of special tools and programs on the Internet platform. The Internet brings the world together, but only virtually. Various social networks such as Facebook, Instagram, Skype, Twitter enable quick and easy communication with people who are on the other side of the planet. With that, information spreads very quickly and easily, because the rate of internet users is very high. Extremist groups make very good use of these networks, especially for their purposes related to the recruitment and training of fighters, so that they can then go to various battlefields in the Middle East.

The danger of online radicalization used by terrorist networks poses a big problem for the security services because the very act of tracing their communication can be faked and thus the plot for a particular terrorist attack or extremist act remains undetected. With the development of internet platforms, the way of spreading radical ideas has changed, apart from personal contacts and the spread of radicalism in paramosques that are not sufficiently controlled by state institutions, radical ideologies have started to spread quickly and via the internet, of course at a high speed. Terrorist groups are also recruiting experts in the field of informatics in their ranks in order to encrypt the messages between themselves, not to leave any virtual traces and preferably hacker attacks on certain state institutions, all in order to show their readiness that they will always be one step ahead of the security-intelligence services and state anti-terrorism services.

Mark Sageman is very explicit in his statement that the Internet can promote another special phenomenon, namely the so-called "lonely persons". Sageman points out that it is a new direction that has not been considered much and should be given more attention. Regarding the role of the Internet as an incubator or accelerator of "lone wolves" as a phenomenon and occurrence, it is stated that the Internet is an effective means of communication for "lone wolves" because it provides them with a place and opportunity to receive radical materials, training manuals, and video materials. De facto, it enables direct contact in the community of like-minded people around the world, who can connect, radicalization and spread of extremist ideas are encouraged and various activities are carried out (Sageman, 2008).

1 davorarsikjku@yahoo.com

INTERNET AND ONLINE RADICALIZATION

Internet radicalization as a kind of hybrid threat represents a wide field of action for criminal and extremist groups. Easy access to the internet, data and information derived from it can pose a security threat. We use a small percentage of the Internet space to which we have simple access through several Internet tools and search engines, but there is also a dark web to which access is a little more difficult, but not impossible. It is accessed using special tools and networks such as the Tor browser.

Tor (an acronym for The Onion Router) is essentially a network that masks online traffic. Tor browser is an open-source platform managed by volunteers and, due to its onion routing, creates anonymity for users who access websites and servers through this network. The browser is often used legitimately by journalists and other users who need to protect their identities, for example, while investigating the opposition in a legal dispute, or researching competitors. In the simplest terms, Tor browser is a software that allows users to browse the internet with a relatively high degree of privacy. The network and browser take their name from the fact that they direct all web activity through several routers—called nodes—much like going through the layers of an onion, making it difficult to track and identify users.[2]

The dark web is a small, less accessible part of the deep web. Both share one thing in common: Neither can be found in search engine results. The main difference between them is in how their content is accessed. Deep web pages can be accessed by anyone with a standard web browser who knows the URL. In contrast, dark web pages require special software and knowledge of where to find the content.[3]

The dark web is a dangerous place, where drugs are bought and hitmen are hired, but it can also be a safe way to browse the web if privacy is seriously compromised. And thanks to the Tor browser, all of this is easy to do, a de facto breeding ground for radical Islamists and lone wolves.[4]

The dark web [5] is a term that refers to a collection of websites that exist only on an encrypted network and cannot be found by traditional search engines or opened by ordinary web browsers. Almost all dark web sites hide their identity using Tor tool/network.

Tor represents a network platform that makes certain actions of the Internet user invisible, that is, anonymous.

The Tor Project, Inc, became a 501(c)(3) nonprofit in 2006, but the idea of "onion routing" began in the mid-1990s. In the early 2000s, Roger Dingledine, a recent Massachusetts Institute of Technology (MIT) graduate, began working on an NRL onion routing project with Paul Syverson. To distinguish this original work at NRL from other onion routing efforts that were starting to pop up elsewhere, Roger called the project Tor, which stood for The Onion Routing. Nick Mathewson, a classmate of Roger's at MIT, joined the project soon after. By the end of 2003, the network had about a dozen volunteer nodes, mostly in the U.S., plus one in Germany.[6]

It helps to hide certain activities on the internet. When a certain website with questionable content is operating on the Internet using the Tor application, it is not possible to find out who is behind that page, nor who hosts and maintains its validity.

2 https://www.kaspersky.com/resource-center/definitions/what-is-the-tor-browser
3 https://www.techtarget.com/whatis/definition/dark-web
4 wolves.https://www.wired.com/story/what-is-the-dark-web-how-to-access/
5 https://pcchip.hr/internet/korisne-aplikacije/vodic-kako-pristupiti-deep-webu-a-kako-darknetu-1-dio/
6 https://www.torproject.org/about/history/

The dark web is all that ordinary browsers cannot see due to certain unknown reasons, and the dark web is a part of the dark web where prohibited content is found, it is used for the training of terrorist groups, their encrypted exchange of information and mutual cooperation.[7]

For this, other tools are used to access the dark web. In it many materials for indoctrination and radicalization of individuals, ideas for carrying out terrorist attacks can be found.

Terrorist groups to implement their strategies use many tools on the Internet for mutual communication, and in most cases, these are encrypted messages with special codes to prevent the security services from entering their trail. In a Eurostat survey conducted in 2015, an analysis was made of the annual increase in new internet users in the EU.

In 2022, the internet was used mainly to communicate with others, sending/receiving e-mails (77%), instant messaging (72%), to find information about goods and services (70%), telephoning or video calls (66%) and watching internet streamed TV or videos (65%).

A majority of people also used the internet for reading online news sites/newspapers (64%), watching video content from commercial or sharing services (61%), banking (60%), participating in social networks (58%), and listening to music (54%). [8]

According to these data, we can agree with the theses of scientists and researchers about the use of the Internet for terrorist purposes, and further indicate that the Internet facilitates the process of radicalization, because it is available to a large number of people around the world, 24 hours a day and in this way, the flow of information is facilitated, that is, the Internet provides space for the spread of terrorist propaganda and extremist beliefs.

By searching one of the tools such as Google Chrome, one of the world's most famous search engines, one can get access to a huge number of written documents, video clips, instructions related to terrorism and extremism.

According to sources to Europol from 2013 to 2015 the following figures describe the situation with acts related to terrorism and violent extremism. (Europol)[9]

Table 1.

Year	**2013**	**2014**	**2015**
Number of individuals detained in the EU for terrorism-related offences	537	774	1077
Number of persons detained for jihadist terrorism	216	395	687
Number of convictions for terrorism	258	345	417
Number of acquittals due to terrorism	78	107	110

On publicly available browsers for using internet services, one can get access to a huge number of written documents, video clips, instructions related to terrorism and extremism.

In the texts and messages, the English language is used because of its prevalence. So, for example, if data and materials related to terrorism and criminal acts are searched for on the Google Chrome

7 Source: Boris Plavljanic - IT expert at the Zagreb software company DEKODE, an expert in Internet networks and a connoisseur of surface and dark Internet methods. (https://poslovnipuls.com/2024/02/26/karijere-boris-plavljanic-decode/)

8 https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20221215-2

9 The data is taken from the Europol website.

search engine, a large number of results will be obtained. Thus, searching for the following words yields these results:[10]

1) "How to make a bomb?" or "How do I make an explosive device?" has 462,000,000 views.
2) "How to make da suicide belt!" or "How to make a suicide belt!" has 19,200,000 views.
3) "Islamic state" has 362,000,000 views.
4) "Jihadists" or "Jihadist" has 5,100,000 views.
5) "Beheading videos" - video materials whose content is the beheading of innocent victims, a method used by terrorists to intimidate and send a message that contains fear and panic to ordinary citizens and has 21,100,000 views.
6) "Who is Osama Bin Laden?" or "Who is Osama Bin Laden?" with 25,200,000 views.
7) "Who is Abu Bakr al-Baghdadi?" or "Who is Abu Bakr al-Baghdadi?" with 12,500,000 views.
8) "Wahhabism" or "Wahhabism" with 3,900,000 views.
9) "How to prepare a terrorist attack" or "How to prepare a terrorist attack" with 114,000,000 views.
10) "Training for terrorists"[11] or "Training for terrorist fighters" with 25,700,000 views. (Siqueira & Arce, 2020)

This data was obtained by searching the internet and these numbers refer to the day of the search, so the probability of being increased or decreased exists because new materials can be uploaded daily, and certain materials can be removed from the internet. These numbers are displayed by the search engine according to the words that are written, of course not all of these reviews actually contain such content, but of course it is enough that a certain percentage of the numbers contain radical materials that can be easily accessed every day, there is a great danger from this kind of radicalization.

Through the Internet platforms, easy communication between terrorist networks is carried out, propaganda is carried out, people who are easy to radicalize will enter the pre-radical phase very quickly with the help of this phenomenon. Such an example is seen in the documentary film of a Bosnian television called "Terrorist", where the parents of two young boys from Bosnia who have already left for the battlefields in Syria tell how the radicalization of their sons, who were exemplary children, began. The boys' mother said that members of a certain jihadist structure that operated in para-mosques outside the settlements, mostly in mountain villages, came to the boys' home and gave them CDs, certain materials with radical-extremist content. When asked by the boys' mother what the materials contained, they stated that they were songs, and did not contain any material with a radical-extremist ideology.

COMPARATIVE ANALYSIS AND SCOPE OF THE LEGAL REGULATION IN THE REPUBLIC OF NORTH MACEDONIA AND THE SURROUNDING COUNTRIES

In the Republic of North Macedonia, the Criminal Code includes some criminal acts that cover at least part of this problem. The problem with internet radicalization, as well as with any kind of spreading of hate speech, threats, and in the last period, the cynical mockery and humiliation of certain individuals on social networks, which led to the execution of suicidal acts and other illegal acts that are not criminal enough - legally incriminated.

10 Арсиќ, Д.,2021 „Странските борци повратници од боиштата од Блискиот Исток како безбедносна закана по Република Северна Македонија", Магистерски труд,.

11 https://www.sciencedirect.com/science/article/abs/pii/S0176268020300264?via%3Dihub

In chapter thirty-three, there is article 394-a[12] Terrorist organization, and further down in the criminal code is Dissemination of racist and xenophobic material through a computer system Article 394-d (1) Whoever disseminates racist and xenophobic written material to the public through a computer system, image or other representation of an idea or theory that aids, promotes or incites hatred, discrimination or violence, against any person or group, on the basis of race, color, national or ethnic origin, as well as religious belief, will be punished with imprisonment from one to five years. 168 (2) With the penalty from paragraph (1) of this article, the person who commits the crime through other means of public information will also be punished. (3) He who commits the crime from paragraphs (1) and (2) of this article by abusing his position or authority, or if due to those crimes there is disorder and violence against people or large-scale property damage, will be punished with imprisonment from one to ten years. (Criminal Code of the Republic of Moldova "Official Gazette of the Republic of North Macedonia" No. 37/96)

The crime of Terrorism, Article 394-b, is also included in the same chapter - and it only mentions as one sentence the destruction of public facilities, transport systems, infrastructure facilities, computer systems, which de facto and de jure is a very small scope of what they are can be used as a term for computer systems and whether only by destroying but also by abusing them leads to the degree of spreading of radical ideas as with the speed of light.

Article 251 of the CC of RSM Damage and unauthorized access to a computer system also mentions the damage to computer systems, unauthorized access to passwords, etc., but the possibility and danger of using the same computer systems for the spread of dangerous and radicalized information is not mentioned again. material that can be the basis for indoctrinating easy target individuals or the known lone wolves who have no other choice but to use these platforms to prepare and train themselves to perform such actions.

In a comparative experience with the Republic of Serbia in this area of security research, one can come to the conclusion that the situation is similar. We will list in more detail the crimes that have elements of computer crime. In Chapter 27 of the Criminal Code of the Republic of Serbia,[13] there are the following more or less basically similar crimes: Damage to computer programs (Article 298), Computer sabotage (Article 299), Preparation and introduction of computer viruses (Article 300), Computer fraud (Article 301), Unauthorized access to computer systems (Article 302), Unauthorized use of a computer network (Article 304), ("The Official Gazette of the Republic of Serbia", no. 85/2005, 88/2005 - amended, 107/2005 - amended, 72/2009, 111/2009, 121/2012, 104/2013, 108/2014, 94/2016 and 35/2019), Public call to the commission of a crime of terrorism in Article 391a, Recruiting and training for the execution of terrorist acts in Article 391b, Financing of terrorism Article 393.

In Chapter 27 of the Criminal Code of the Republic of Serbia, there are several criminal acts that are related to the possibility of spreading radical ideas using the Internet. Here are included the crime of damage to computer data and programs in article 298, Computer sabotage article 299, Creation and spread of computer viruses article 300, Computer fraud article 301, Unauthorized access to computer systems article 302. Unauthorized use of computer systems article 304.[14]

Through the analysis of the criminal acts of the Criminal Code of the Republic of Serbia, it can be concluded that they include a wide range of illegal actions through which radical Islamists can spread

12 The Criminal Code ("Official Gazette of the Republic of Macedonia" number 37/96)

13 Criminal Code ("Official Gazette of RS", no. 85/2005, 88/2005 - amended, 107/2005 - amended, 72/2009, 111/2009, 121/2012, 104/2013, 108/2014, 94/2016 and 35/2019)

14 Criminal Code ("Official Gazette of RS", no. 85/2005, 88/2005 - amended, 107/2005 - amended, 72/2009, 111/2009, 121/2012, 104/2013, 108/2014, 94/2016 and 35/2019)

radicalization under the cover of others through softer actions. Through unauthorized access to certain computer systems to send messages of radicalism and Islamism.

The biggest problem for the state authorities is how to identify the channels through which Serbian citizens arrive at the world's battlefields, as well as those who organize it. In addition to undoubtedly personal contacts, social networks are also widely used in this sense, where profiles that directly or indirectly recruit participants in the conflict appear and disappear just as quickly, both in Iraq and Syria, and in Ukraine. Some cases of terrorist activity have shown the mobilizing effect that an attack can have on an international level and the significant influence of social networks on the radicalization of individuals. The Internet creates vast opportunities for building relationships with like-minded people around the world and creating an environment that encourages violence.[15]

It is believed that the recruiters were paid handsomely for this work and that the narratives they used to recruit young people to go to Syria were untrue and tailored to suit them. The main and most influential recruiting narrative was that one was not going to Syria to defend the Islamic State, to fight for their goals, but for the goals and defense of all Muslims. All Muslims were presented as victims of discrimination and oppression, and young people were called to defend them. The Internet was the main way, a platform to recruit and change the thinking of the youth. They were offered videos of discrimination against Muslims and violence against them, propaganda and appeals for help. This kind of narrative was particularly successful because, according to Islamic beliefs, Syria is the promised land, the place where the "struggle of truth against falsehood" will begin. Possibilities and needs of the community for deradicalization and reintegration processes.

In Novi Pazar, the most accepted tolerant understanding of Islam is "the existence of different schools of thought within Islam, with the understanding that the basic tenets of the faith are common to all". Radicalism occurs when all other opinions are excluded and only one is imposed. Exclusivity further leads only to extremism. Extremism is understood as any religious position that is exclusive, because from the point of view of faith it does not make sense, since one of the basic messages of Muhammad's teaching is that one should not be exclusive and extreme. There is also a story about two students from Novi Pazar in Saudi Arabia who reached such a level of exclusivity that they considered all Muslims in the world to be infidels. They said, "only you and I are believers." One day they quarreled and after that each of them considered himself the only remaining true Muslim in the world. This story illustrates the extent to which those radicalized in this way are exclusive and do not accept authority. In their experience, all extremists when they reach those stages no longer have a group they belong to and don't accept authority. Because of a small disagreement, they will turn against everyone else.[16]

Mainly in the criminal code of the Republic of North Macedonia and the Republic of Serbia, the part where these negative phenomena are covered are similar, and both codes lack incriminations in the sense that recruiting, writing on social networks as a means of communication can be a potential security threat. Online radicalization itself is an insufficiently controlled method used by terrorist and extremist groups around the world.

There are several risk factors that have an impact on the emergence and implementation of online radicalization. Access to the Internet and its contents on a large scale is cited as the main motive. The weak institutional control over what and how is written and what materials are implemented and shared on social networks. Determining the reasons or motives that lead to radicalization according to

15 chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.helsinki.org.rs/serbian/doc/Uspon%20desnice%20-%20slucaj%20Srbija.pdf

16 chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.helsinki.org.rs/serbian/doc/Uspon%20desnice%20-%20slucaj%20Srbija.pdf

(Haji-Yenev 2021): Political goals (for example: changing the form of government, such as abolishing the democratic system with elections as we have now and introducing a dictatorship); Social goals (for example: how fans of a sports club try to make a change or achieve a goal – to convince fans from other clubs to support their club); Religious goals (for example: how members of a religion want to impose a change that will make their religion dominant and exclusive).

The process of online indoctrination often occurs through conversation (chats), persuasion, influence, affection or lectures organized in closed or isolated groups, forums, special rooms. Gathered through online newspapers, blogs, services and chat rooms, participants enter the forums where extremist ideology is self-reinforcing. (Shan and Phillips 2021)

As examples of online radicalization and the spread of extremist ideas and propaganda, we can cite the example of ISIS. ISIS had the ability to create a global network or brand to spread its ideology and message and thereby mobilize over 30,000 foreign fighters around the world could not have materialized if proper access and opportunities offered by the internet were not provided.

The following five roles that the Internet plays in promoting radicalization can be identified: (i) the Internet creates more opportunities for radicalization; (ii) the Internet acts as an "echo chamber"; (iii) the internet accelerates the radicalization process; (iv) the internet enables radicalization without physical contact; (v) the internet increases opportunities for self-radicalization. The younger generation is particularly vulnerable to online radicalization because they accept online media much more naturally as part of their lives and social relationships than older generations. This means that the importance of face-to-face communication is decreasing and contacts via the Internet face a lot of trust, making policy interventions towards increased security on the Internet a priority for every government. (Haji-Janev & Risteska & Shabani, 2021)

The Internet and its tools are also used as a propaganda tool using the power of the media and the spread of misinformation online. What will mark the current year 2024 is the influence of the extreme right in the elections in several countries of Western Europe. Of course, the influence of Russian Internet propaganda on the decisions of citizens from European countries is worth noting. These activities are in the context of the so-called "information warfare."

In that context we can mention the influence or interference in the 2016 US presidential election. Namely citizens of the Republic of North Macedonia were mentioned in the global media for the involvement of hackers from Veles city in helping the election of Donald Trump in the 2016 US presidential elections.

In the current year 2024, citizens of the Republic of North Macedonia were mentioned that with their malicious IT activities in the recent electoral processes in Venezuela.

The public prosecutor of Venezuela, Tarek William Saab, accused that certain individuals, IT experts from Macedonia, had influence in the recent election processes in Venezuela with illegal activities and illegal malicious breach in the Venezuelan information system. The prosecutor indicated on grounds of suspicion that the Venezuelan local opposition had cooperation with Macedonian hackers, during which attempts were made to manipulate the election results for the election of the president of Venezuela, which ended unsuccessfully.

The Venezuelan Attorney General has officially announced that an investigation has been launched into the hacking of the data transmission system of the National Electoral Council (CNE). A cy-

ber-attack coordinated by Macedonia was recorded with the aim of changing the election results in favor of the opposition.[17]

If the information about the involvement of persons belonging to the IT-underground from Macedonia in influencing the elections in Venezuela, the USA is confirmed, the possibility of their involvement in Internet propaganda against European citizens in the recent elections, as well as their connection with IT, is not excluded. - hackers from Russia, which should be the subject of research in the coming period.

Ukrainian President Zelensky's[18] call for all interested persons to join the battlefields throughout Ukraine after the Russian invasion in 2022 through an online form is a striking example of the online spread of extremist ideas and propaganda. Of course, this de jure is a crime in our legislation and any departure would be sanctioned by law.

Internet propaganda as a powerful tool of the great world powers was also used in the past to interfere in the domestic and state interests of certain countries. Such is the glaring example of Russia's meddling in the 2016 election, where the US National Security Service issued a report on Russian influence on young voters in the US.

The Internet Research Agency (IRA), based in St. Petersburg, Russia, created thousands of social media profiles it claimed were Americans who supported radical political groups and planned or promoted pro-Trump and anti-Clinton events. They reached millions of social media users between 2013 and 2017. Fabricated articles and disinformation were distributed by the Russian government-controlled media and promoted on social media. In addition, computer hackers linked to the Russian military intelligence service (GRU) infiltrated the information systems of the Democratic National Committee (DNC), the Democratic Congressional Campaign Committee (DCCC), and Clinton campaign officials, particularly Chairman John Podesta, and publicly released stolen files and emails during the election campaign that could damage the reputation of one of the candidates. Several individuals with ties to Russia contacted various Trump campaign associates, offering both business opportunities to the Trump Organization and providing damaging information about Clinton. Russian government officials have denied involvement in any of the hacking or leaking of information. Russian meddling activities prompted strong statements from US intelligence agencies, a direct warning from then-US President Barack Obama to Russian President Vladimir Putin, the reimposition of economic sanctions against Russia, the closure of Russian diplomatic facilities and the expulsion of their staff.

The Senate and House Intelligence Committees have conducted their own investigations into the matter. Trump has denied there was any interference, claiming it was a "hoax" perpetrated by the Democratic Party to explain away Clinton's loss.[19]

On April 25, 2024, the European Union passed a special resolution on the interference of the Russian Federation in the European Parliament elections held at the beginning of 2024. The document voted by the European Parliament analyzed the election process and made some conclusions regarding the interference in internal affairs by Russia and its partners.

The resolution of the European Union and the European Parliament adopted by 433 votes "for" 56 "no" with 18 abstentions the resolution on "Russiagate": allegations of Russian interference in the

17 The monitoring of communications and the manipulation of data have become a negative phenomenon in the IT underground in Macedonia, New Macedonia, 08/08/2024

18 https://www.theguardian.com/world/2022/feb/27/ukraine-appeals-for-foreign-volunteers-to-join-fight-against-russia

19 Hosenball, Mark (2020-08-19). Mohammed, Arshad, yp. „Factbox: Key findings from Senate inquiry into Russian interference in 2016 U.S. election". Reuters). Washington. 2021-09-05.

democratic processes of the European Union. The text adopted at the plenary session was submitted by EPP, S&D, Renew, Greens/EFA, ECR groups and members. The resolution states that there is evidence of Russian interference and manipulation in many democratic countries, as well as its practical support for extremist forces and radical-minded entities to promote destabilization of the Union. The Parliament's special committee on foreign interference in all EU democratic processes, including disinformation, has exposed in detail Russian-led efforts and operations to infiltrate, influence and interfere with European democracies and EU institutions. Although the European Parliament's response to foreign interference has become more cautious, the resolution stresses that stronger measures should be adopted to ensure effective protection against undue external influence. Internal reforms have yet to be undertaken and must be done, Russia has established contacts with parties, personalities and movements in order to rely on actors in the institutions of the Union in order to legitimize Russian positions, support independence movements and carry out pressure to ease sanctions and mitigate the consequences of international isolation. Members of certain political groups, as well as some non-affiliated members, spread blatant pro-Kremlin propaganda in Parliament. Furthermore, the Parliament unequivocally condemns the ongoing Russian efforts to abuse and falsify the historical memory of the most tragic periods in Europe, including the consequences of the Molotov-Ribbentrop Pact and the terror that followed for the territories conquered by Nazi Germany and Communist Russia, in order to make an attempt to justify its present brutal, illegal and inhumane aggression and its expansionist policy. It expresses deep concern over reports that MEP Tatyana Danoka may have acted as an informant for the Fifth Service of the Federal Security Service of the Russian Federation while also serving as a Member of the European Parliament. The resolution also points to other instances where members knowingly serve Russia's interests. It considers it imperative to immediately conduct a thorough internal investigation in order to assess all possible cases of foreign interference by Russia and other types of malicious interference in the work of the European Parliament. Parliament also expressed particular concern over recent reports that Russian .authorities are providing specific narratives to far-right political parties and actors in various EU countries, notably Germany and France, aimed at undermining public support for Ukraine, after the full invasion of Russia in 2022. Members are extremely concerned about the alleged relationship between Catalan secessionists and the Russian administration.[20]

In the context of the latest events in Vienna, where a major terrorist act was prevented, the thesis that using Internet applications spreads radical ideas is confirmed again. Arrested 19-year-old Muhammad at his home in the town of Ternitz in Lower Austria, where a terrorist attack was being planned during Taylor Swift's concerts in the Austrian capital. During the search of his home, chemical substances and technical devices were found, which are now being examined. He said he stole the chemicals from his former employer. A few weeks ago, he posted a video on TikTok swearing an oath to the Islamic State.

The American pop star Taylor Swift was supposed to perform in Vienna today, tomorrow and Saturday. The concerts were canceled yesterday due to serious security threats, which followed the arrest of Muhammed and another Austrian citizen.

The arrest of 19-year-old Muhammed of Macedonian origin, suspected of planning a terrorist attack on Taylor Swift's concerts, recalls the November 2020 terrorist attack, also in Vienna, when 20-year-old Kujtim Fejzulai, of Macedonian origin, killed four and injured 23 more people.[21]

20 Resolution adopted by the European Parliament 2024/2548(RSP); Resolution on Russiagate: allegations of Russian interference in the democratic processes of the European Union

21 https://sdk.mk/index.php/makedonija/avstrija-pobara-od-makedonskata-politsija-da-go-proveri-19-godishnikot-uapsen-za-planirane-teroristichki-napad-na-kontsertite-na-tejlor-svift/

In 2020, Fejzulai was killed by the police during the attack. Austrian police said that Fejzulai, born in Vienna, had both Austrian and Macedonian citizenship, and his parents were originally from Chelopek. He had never been to Macedonia. Police also said he was an Islamic State sympathizer who served several months in prison in 2019 for trying to leave to fight in Syria. Police confirmed that Fejzulai was released early from prison after undergoing a de-radicalization process.

In both cases, there is the use of the Internet as a method and way of preparing and training for committing terrorist acts. Using the TOR network, terrorists can exchange information and data on the methods of execution, on the method of financing terrorist attacks, and the same contacts cannot be detected by the security services.

The example of Wagner's group, who died in a helicopter accident a few months ago, was succeeded by his son Pavel Prigozhin, who also uses online methods and forms to apply for participation in a military hotbed.

In comparison with Kosovo and Metohija[22], in their criminal code there are several crimes that have elements of crimes related to the abuse of computer systems, but again the part of online radicalization, online recruitment of fighters and extremists is exempted. In Article 199[23] Violation of the secrecy of letters and computer databases, Article 327 Unauthorized entry into a computer system. In the same, there is a criminal section Harassment where in one article it is stated if the same thing happens through computer systems, but nothing of the possibility of online radicalization or recruitment. In Article 134 Incitement to commit terrorist acts, distribution, incitement, spread of radical ideology, but again without incriminating the possibility of online radicalization, online spread of that ideology through social networks. (Official Gazette of Kosovo / no. 2 / January 14, 2019, 1 code no. 06/l-074 Criminal Code of Kosovo)[24]

Again, the fact is missing that nowhere in the above-mentioned criminal legislations is mentioned the online spread of radical ideas, sensitive chats between extremists and new people who have yet to be indoctrinated. In Bosnia, indoctrination of young people with covert materials and electronic devices where false written content, such as the example with Toše's CD, and in fact, inside, the security forces of BiH found radical materials, propaganda, ways and methods of committing the crime of Terrorism.[25]

A study by Jens Binder and Chris Baker-Bill[26] from Nottingham Trent University in England highlights the danger of online radicalization that can lead to the commission of a terrorist act, namely in that study it is stated that a greater number of convicts who are convicted of certain crimes related

22 According to the Constitution of the Republic of Serbia Kosovo and Metohija is an autonomous region in Serbia. (Starting from the state tradition of the Serbian people and the equality of all citizens and ethnic communities in Serbia, starting from the fact that the Province of Kosovo and Metohija is an integral part of the territory of Serbia, that it has a position of essential autonomy within the sovereign state of Serbia and that from such a position of the Province of Kosovo and Metohija follows the constitutional obligations of all state bodies to represent and protect the state interests of Serbia in Kosovo and Metohija in all internal and external political relations, the citizens of Serbia bear).Source: Based on Article 133, paragraph 3 of the Constitution of the Republic of Serbia and Article 25 of the Law on Referendum and People's Initiative ("Official Gazette of RS", no. 48/94 and 11/98)

23 The Official Gazette of the Republic of Kosovo / no. 2 / January 14, 2019, Pristina 1 law no. 06/l-074 Criminal Code of the Republic of Kosovo.

24 Based on Article 142, paragraph 2 of the Constitution of the Republic of Serbia and Article 25 of the Law on Referendum and People's Initiative ("The Official Gazette of the Republic of Serbia", No. 48/94 and 11/98), the Republic of Serbia has an autonomous province of Vojvodina and an autonomous province of Kosovo and Metohija. The essential autonomy of the Autonomous Province of Kosovo and Metohija will be regulated by a special law adopted according to the procedure provided for amending the Constitution.

25 https://www.capital.ba/teroristi-se-preselili-na-internet-da-vrbuju-i-sire-propagandu/

26 https://theconversation.com/terrorist-recruitment-now-happens-mainly-online-which-makes-offenders-easier-to-catch-196313

to terrorism, training and financing of terrorism were online radicalized, that is, without any offline interactions, but only online contacts and the spread of radicalism.

The radical preacher Anwar al-Awlaki often positioned himself as a propagandist who could motivate Western audiences for a generation of young Western Muslims who sought easy answers to complex questions (often via the Internet), Awlaki helped find a way for the global jihad movement to make it appealed to many who might otherwise have been beyond its ideological reach. In the early 2010s, the main security threat turned to IS. As noted above, over 50,000 individuals traveled to join the group, with IS planning and inspiring hundreds of attacks. In addition, the group has maintained a strong social media presence estimated to have at least 46,000 pro-ISIS Twitter accounts and thousands of foreign terrorist fighters who have participated in various battlefields and often with the help of ISIS supporters who spread radical material online.[27]

This mobilization, combined with the group's social media reach and slick propaganda, has led to widespread concern about the Internet's role in radicalization – UN Security Council Resolution 2178 explicitly requires states to take steps to address this threat and expressed concern about the role of the Internet "in encouraging others to commit acts of terrorism" (United Nations Security Council 2014).

While IS has occupied the headlines around the world, the threat from violent right-wing extremists has not gone away and has seen a strong resurgence in recent years, especially in the context of the internet. Several terrorist attacks in the past five years in which the Internet played an important role, including the 2017 Charlottesville drive-in attack; and attacks in Christchurch, El Paso and Halle in 2019, Buffalo and Bratislava in 2022.[28]

This research uses detailed risk assessment reports for people convicted of terrorism offenses in England and Wales, based on 437 cases between October 2010 and December 2021. These reports are written by trained professionals in their field. The results of this research showed that, over time, people become less and less radicalized offline, such as in certain locations and meeting places or through direct contact with peers and relatives. Mixed radicalization, where extremist offenders are subject to both online and in-person influences, is also declining. It is now much more common for people to become radicalized online. They may learn from online sources or engage with extreme views on social media. They may also use Internet forums and chat groups that provide easy access to other like-minded people. These findings show that despite current perceptions of the growth of encrypted messaging services, online radicalization does not necessarily occur predominantly through one-to-one communication channels. The most commonly named platform is YouTube.[29]

CONCLUSIONS AND RECOMMENDATIONS

In the last years of the technological development of society, the ways of communication have also developed, the speed of information exchange is increasing and the overall way of functioning of the

27 This document has been prepared for the European Commission however it reflects the views only of the authors, and the European Commission is not liable for any consequence stemming from the reuse of this publication. More information on the European Union is available on the Internet (http://www.europa.eu). Luxembourg: Publications Office of the European Union, 2022

28 This document has been prepared for the European Commission however it reflects the views only of the authors, and the European Commission is not liable for any consequence stemming from the reuse of this publication. More information on the European Union is available on the Internet (http://www.europa.eu). Luxembourg: Publications Office of the European Union, 2022

29 https://theconversation.com/terrorist-recruitment-now-happens-mainly-online-which-makes-offenders-easier-to-catch-196313

social order is taking a new direction. Today, human existence cannot be imagined without the use of Internet platforms, in a word, everything is connected with electronic communications and the Internet. In the last 2 decades after the big terrorist attack in the USA, the world continued in another dimension and with questions that the authorities had to answer before their citizens. Even then, in that terrorist attack, information about the possible encrypted messages between the terrorists was spread in the media to reduce the chances of their detection. Internet radicalization on the dark web is a potential target for terrorist networks in the future. Ways, means and methods of how to quickly spread the radical idea, what plans are in the future, and how an application for participation in some foreign military hotspots can be filled out and sent through a simple online form.

The Internet is used as a propaganda tool and certain groups use it to hack and interfere in the internal affairs of their opponents. Interfering in election cycles as the most democratic right of citizens is a flagrant violation of international law and its regulations, but also a violation of democracy and human rights and freedoms.

Internet radicalization will continue to pose a danger and security threat to the normal functioning of society in the future. The large number of war hotspots around the world, in recent years with the Russian invasion of Ukraine, the attacks in Gaza by the Israeli army on Hamas are possible potential cells for the activation of certain terrorist groups, which have and will include individuals for online spreading their ideologies and ideas for action.

Technological advances have opened new channels for extremist organizations to spread their messages and win support for their political goals. This tendency can also be observed in the Western Balkans (WB). In addition to facilitating communication between individuals, social networking platforms have also facilitated the spread of hateful voices and extremist views. Extremist organizations have mastered the use of the Internet to spread their radicalism ideology and find supporters for their goals. (Dukić, 2021)

High school students are very dependent on their classmates for a sense of well-being, needing to feel part of a group, but also to be perceived as unique, and their currency is likes and ratings. CIKP's core study "Transition to Prevention: Using Education to Prevent Online Radicalization Among Youth" provides additional findings for high school students in Gostivar, Kumanovo, Skopje, Shtip, Tetovo and Veles, noting that 99% of students have access to the Internet in their homes, of which 85% said that they have access at any time, but also that in 74.4% of homes there are no rules for using the internet. Almost half of the students would accept parental control (44.1%), while more than half (55.9%) of the students think that parental supervision or control is necessary.[30]

The European Commission in its document entitled Radicalization Awareness Network (ec.europa.eu/ran) lists several main points related to online radicalization on the Internet:

- Extremist ideologies are not limited to the influence of one state,
- The Western Balkans is very susceptible to the spread of misinformation and fake news,
- The region of WB still endures the aftermath of previous wars in the former SFRY.[31]

As possible recommendations, greater international cooperation in the area of the internet and online radicalization can be mentioned, in the form of preventive action and prevention of the spread of radicalism on the internet. Threats from online radicalization do not represent a single threat only for one

30 Study on young people in North Macedonia 2018/2019, Friedrich Ebert Foundation, p.16 available at: http://library.fes.de/pdf-files/id-moe/15266.pdf

31 https://home-affairs.ec.europa.eu/document/download/1cca4520-3c96-42f2-adb4-2d1cb26e9611_en?filename=ran_paper_online_radicalisation_p-cve_approaches_in_wb_16062022_rs.pdf

territory or only for one country, the danger from it can affect both regional and international levels. The factor of cooperation between institutions, young people and especially those who are vulnerable to extremism and radicalism is very important. Non-governmental institutions can play an important role in the chain of preventive measures to prevent the spread of radical ideas on Internet platforms. Important recommendations are the organization of forums, lectures and training of young people to recognize such a danger and to inform the competent authorities about it.

To introduce experts from the field of security and criminology in primary and secondary schools in order to hold briefings, trainings and trainings of a practical nature on how to recognize an attempt at online radicalization. In the amendments to the Criminal Code itself, an amendment can be proposed by inserting a new article/paragraph in the Criminal Code with the name online radicalization or online spreading of extremist and radical ideas that conflict with normal social life.

LGUs in cooperation with government bodies and non-governmental organizations to organize training workshops for the most vulnerable groups of the population, especially the young generation which is a soft target and there is a danger of future radicalization by radical and extremist groups, in order to present the danger that it brings internet radicalization, suspicious profiles on social networks that can be a choice of radical ideologies.

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TRENDS OF CHANGES AND GENDER DIFFERENCES IN INTELLECTUAL ACHIEVEMENTS AND PHYSICAL ABILITIES AT THE ENTRANCE EXAM OF THE UNIVERSITY OF CRIMINAL INVESTIGATION AND POLICE STUDIES

Danijela Spasić, PhD[1]
Radivoje Janković, PhD
University of Criminal Investigation and Police Studies, Belgrade, Serbia

"Good cops always seem to identify the causes of problems and to come up with the least troublesome ways of solving them. Good cops think ahead and always leave a way out of any tough situation. Good cops rarely have to resort to the law to solve minor order-maintenance problems like drunks and noisy kids on the street. Good cops spend their time finding out about the people and places on their beats instead of lurking at speed traps or near badly marked stop signs."

(Skolnick & Fyfe, 1993, p. 127)

INTRODUCTION

Good policemen and policewomen are not born, they rather become good not only through the processes of learning, education, from the lowest to the highest, university level, but also via everyday practice, resolving critical incidents and responding to challenges. University education can contribute to the development of various skills essential for the work environment and better efficiency. What is more, throughout the education process, students are taught critical thinking, problem solving, communication, team work, time management and organizational skills, which may positively affect their professional competences (Ionescu & Cuza, 2012). With the speed at which social surroundings are changing, as well as rapid technological advances, it is the mentioned competences of university education that are considered crucial for efficient police work (Roberg & Bonn, 2004). Likewise, high education of police officers could have a beneficial impact on their ability to better analyze critical situations, assess risk, as well as, with clear and precise communication with their colleagues (and citizens), resolve critical incidents with the use of force only if absolutely necessary (Rydberg & Terrill, 2010).

The advantages and qualities of higher education of police officers were recognized even over 30 years ago. It was back then that the first national studies emphasized that police officers with higher education "are more global in their thinking, they can adapt better to change and establish good relationships outside of the police community." (Carter & Sapp, 1990). Better-educated police officers demonstrate analytical skills, communicativeness, the ability of quicker problem solving and initiative, fewer prejudices, and are more "globally oriented". In all comments on the advantages of college education, two factors stand out: communicativeness and social skills. Formally educated police officers commu-

1 danijela.spasic@kpu.edu.rs

nicate better with the public, hence eliciting fewer complaints. The social skills acquired through higher education are at least as relevant, if not even more so, than academic skills (Carter & Sapp, 1989).

The police, as an organizational structure and personnel system with the right to use means of coercion (physical force) to perform their duties, "reinforce" gender practices based on unverified assumptions that support beliefs not only about the roles of men and women, but also about their abilities and values (Rabe-Hemp, 2009: 115). However, contemporary police forces require that women and men work side by side, using equal police powers and responsibilities (Janković et al., 2020). Gender practices raise the issue of gender efficiency in the moments when the only solution to resolving an incident seems to be the use of force, i.e., physical strength (Courtright et al., 2013). Nevertheless, even in this case, the required level of physical abilities of police officers can be achieved through adequate selection, provided that it is gender-neutral – unburdened by the demands of male management. Formal obstacles arise in the standards of the selection process itself: requirements related to body height, body weight and physical abilities of male and female candidates, founded on the stereotype of physical strength as one of the essential prerequisites for a career in the police, ignoring the fact that between 80% and 90% of police interventions end without the use of force (Balkin, 1988).

Since 2002, the new system of police education has enabled the enrollment of the first generation of women, creating conditions for reducing discrimination. Equal selection requirements and admission conditions for men and women, as well as equal access to police training and education, have created an educational atmosphere that considers gender identity differences and allows for their equal educational development (Spasić 2008, 2009). Therefore, new personnel and managerial resources, free from gender prejudice, should introduce a gender perspective into other dimensions of police operations (Spasić et al., 2015).

The first step toward quality high education is selection. University selection is the process of choosing students from a population of interested candidates who meet certain predefined criteria, thus enabling them to more successfully master the education curriculum (Allen & Robbins, 2010; Schram et al., 2024). When it comes to university education for police officers, selection systems most often include a health status check, intellectual ability assessment, personality evaluation, and physical ability level (Annell et al., 2015; Koropanovski et al., 2022). The selection process at the University of Criminal Investigation and Police Studies (UCIPS) is designed to identify candidates with the appropriate psycho-physical characteristics, which will support them throughout their studies and ultimately prepare them to become experts in the field of policing (Koropanovski et al., 2020). Student admission to UCIPS is based on a multidimensional positive selection model that includes: health status, personality traits, high school success, proficiency in the native language, general knowledge test, and physical abilities (Dimitrijević et al., 2014; Janković & Koropanovski, 2017).

The entrance exam at UCIPS has played a key role in the selection process since its establishment. Initially, various subjects such as geography, history, and psychology were evaluated to assess candidates' knowledge and traits. However, the current method, which includes the Serbian Language Test (SLT), General Knowledge Test (GKT), and Basic Physical Abilities (BPA) Test, alongside High School Success (HSS), was introduced in 2012. The ranking list is formed based on the results of these tests, with the highest-scoring candidates being eligible for enrollment (Janković & Koropanovski, 2017). In 2018, a significant change was made to the elimination threshold for the BPA test, increasing it from four to eight points (Janković & Koropanovski, 2022). Additionally, since 2018, admission quotas, or the number of students eligible to enroll at UCIPS, have also been adjusted. Considering these changes in the selection system, the primary aim of this research is to determine the differences among enrolled students over the course of four years for all scored segments of the entrance exam (HSS, SLT, GKT and

BPA), as well as to identify trends of change in these very same segments. Additionally, the second aim of the paper is to examine whether there are differences in the entrance exam segments between female and male candidates by analyzing their preferences and abilities in all sections of entrance exam.

METHODS

Sample of Respondents

Four generations of candidates who applied for admission at UCIPS from 2018 to 2021 were observed. All respondents included in the study successfully passed the first selection segment referring to health status and psychological features. Out of a total of 1,339 applicants (551 females and 788 males), 308 (23%) candidates were admitted (EN), while 1,031 (77%) were not admitted (NEN). In terms of gender, the sample of admitted female candidates (EN female) was 120 (39%), which represents 21.8% of the women who applied, whereas the admitted male candidates (EN male) were 188 (61%), representing 23.9% of the men who applied. Due to failing to meet the prescribed BPA standards, a total of 370 candidates were eliminated (199 women and 171 men) (Table 1, Figure 1, and Figure 2). Figure 3 shows the percentage of candidates from the total number who gained admission to UCIPS, while Figure 4 displays the percentage of candidates who did not meet the minimum physical ability standards observed at the general level.

Table 1. *Overview of Candidates Who Applied and Enrolled at Ucips by Gender and Year of Application*

Year	Gender	Total	EN (%)	NEN (%)	EL_{BFA}* (%)
2018/19	Female	109	47 (43.1)	62 (56.9)	40 (36.7)
	Male	203	101 (49.8)	102 (50.2)	33 (16.3)
2019/20	Female	185	30 (16.2)	155 (83.8)	86 (46.5)
	Male	248	40 (16.1)	208 (83.9)	68 (27.4)
2020/21	Female	117	18 (15.4)	99 (84.6)	35 (29.9)
	Male	173	27 (15.6)	146 (84.4)	38 (22.0)
2021/22	Female	140	25 (17.9)	115 (82.1)	38 (27.1)
	Male	164	20 (12.2)	144 (87.8)	32 (19.5)
∑ 2018-2021	Female	551	120 (21.8)	431 (78.2)	199 (36.1)
	Male	788	188 (23.9)	600 (76.1)	171 (21.7)

*number of candidates who scored less than 8.00 points on the GPA assessment test and were thus eliminated

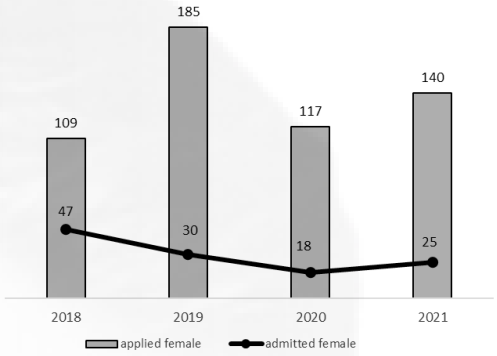


Figure 1. *Overview of the Ratio of Female Candidates Who Applied and Enrolled at UCIPS from 2018 to 2021*

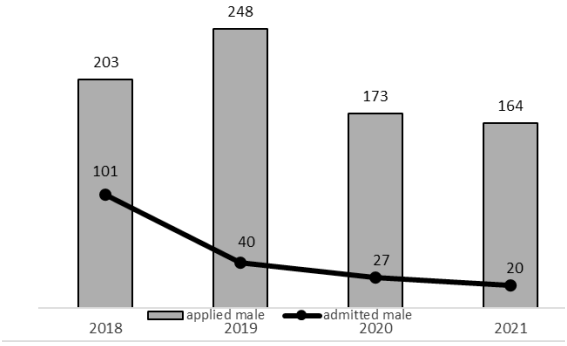


Figure 2. *Overview of the Ratio of Male Candidates Who Applied and Enrolled at UCIPS from 2018 to 2021*

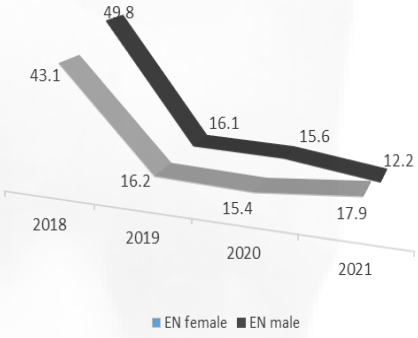


Figure 3. *Percentage of Enrolled Candidates in Relation to the Total Number of Applicants*

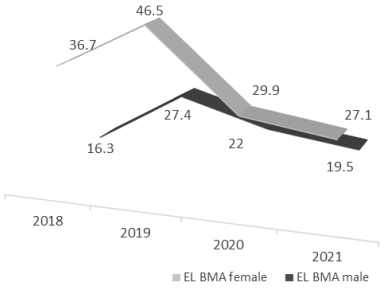


Figure 4. *Percentage of Candidates Eliminated Due to Not Meeting the Minimum BPA Standards*

Variables

The research covered all components of the entrance exam used to select candidates (Janković & Koropanovski, 2017). The total score is obtained by summing the points achieved based on High School Success and the results of the aptitude and ability tests, which consist of three areas: Serbian Language Test, General Knowledge Test, and the assessment of Basic Physical Abilities.

- HSS is represented by the number of points calculated by summing the average grades achieved in each year of high school, after which the obtained sum is doubled. This results in a score range from 16 to 40. In terms of the total number of points that can be achieved on the entrance exam, HSS hypothetically accounts for 40%.

- SLT includes questions on Serbian language grammar and orthography, as well as knowledge of Serbian and world literature. The level of knowledge corresponds to the curriculum applied in high schools in the Republic of Serbia. The questions on the SLT as part of the entrance exam at UCIPS are reviewed by the Faculty of Philology at the University of Belgrade. Candidates answer 20 questions; each correct answer earns one point, whereas each incorrect answer reduces the total score by 0.25 points. The score range on the SLT is between 0 and 20.

- GKT covers questions from various fields, and the achieved result is not necessarily a consequence of formal education acquired through schooling. The success on the GKT is largely influenced by additional knowledge that could be gained by reading books, visiting theaters, cinemas, museums,

art galleries, or sports events. Furthermore, the result of this test can also be influenced by following scientific, political, or cultural content, as well as various electronic and print media. The GKT consists of 40 questions; each correct answer earns 0.5 points, while each incorrect answer reduces the total score by 0.1 points. The number of points that can be achieved is between 0 and 20.

- BPA assesses the general level of physical preparedness and consists of seven individual tests to evaluate: repetitive strength of arm extensor muscles, repetitive strength of trunk flexor muscles, explosive leg muscle strength in horizontal and vertical directions, motor educability, aerobic endurance, as well as maximum force of back extensors (for men), or maximum force of finger flexors (for women). The results of each test are multiplied by standard coefficients (different for women and men), and the total sum of all weighted values gives a score ranging from 0 to 20. A distinctive feature of this test is the elimination threshold set at eight points.

Based on the results, the overall number of points achieved on the Entrance Examination Test (∑EET) is calculated, and the best-ranked candidates, whose number is defined for each year, gain the right to enroll at UCIPS.

Statistics

The results were analyzed using basic descriptive statistical procedures. Measures of central tendency, minimum and maximum values, as well as the symmetric distribution of results, were determined. Based on average values, a trend equation of change and R-squared (R-squared) were calculated. Differences between the results of women and men were established using Independent t-test, while the existence of general differences in variability between generations (2018 - 2021) was determined using MANOVA analysis. The Bonferroni test was used to determine partial differences between pairs of variables. Statistical significance was defined at $p < 0.05$.

RESULTS

Descriptive Statistics

Table 2 shows basic descriptive data for enrolled females, and Table 3 for enrolled males from 2018 to 2021. Average values with standard deviations, as well as minimum and maximum values for each individual year and total for the observed period, are presented.

Table 2. *Basic Descriptive Data for EN Female*

Year	Statistics	HSS	SLLT	GKT	BPA	∑ EET
2018/19	Mean ± SD	35.62 ± 3.06	10.69 ± 3.26	10.48 ± 3.45	10.71 ± 1.96	67.51 ± 6.08
	Min.	26.58	4.25	2.50	8.06	53.19
	Max	40.00	16.50	20.0	16.93	77.22
2019/20	Mean ± SD	37.11 ± 2.83	13.03 ± 2.82	11.87 ± 2.87	11.35 ± 1.51	73.35 ± 4.66
	Min.	29.26	8.0	6.30	8.73	67.59
	Max	40.00	17.50	17.9	14.75	83.38

2020/21	Mean ± SD	37.98 ± 2.47	14.53 ± 1.70	11.93 ± 2.31	11.78 ± 1.76	76.22 ± 3.09
	Min.	31.34	11.25	6.4	8.90	73.39
	Max	40.00	16.75	15.8	15.06	84.01
2021/22	Mean ± SD	38.17 ± 1.97	15.11 ± 2.03	12.60 ± 2.37	13.09 ± 2.58	78.97 ± 2.94
	Min.	33.28	10.25	7.0	8.72	74.42
	Max	40.00	19.0	16.80	18.21	84.60
∑ 2018-2021	Mean ± SD	36.87 ± 2.89	12.77 ± 3.15	11.13 ± 3.34	11.52 ± 2.15	72.66 ± 6.60
	Min.	26.58	4.0	2.5	8.06	53.19
	Max	40.00	19.0	20.0	18.21	84.60

Table 3. *Basic Descriptive Data for EN Male*

Year	Statistics	HSS	SLLT	GKT	BPA	∑ EET
2018/19	Mean ± SD	33.73 ± 4.02	10.26 ± 3.45	10.78 ± 3.52	13.57 ± 2.79	68.34 ± 7.59
	Min.	24.74	2.75	4.0	8.20	54.13
	Max	40.00	18.75	20.0	19.72	84.14
2019/20	Mean ± SD	35.85 ± 3.19	11.06 ± 3.71	12.19 ± 3.40	14.03 ± 3.08	73.13 ± 5.94
	Min.	28.78	5.75	6.9	8.32	67.83
	Max	40.00	18.0	18.3	20.0	84.84
2020/21	Mean ± SD	37.11 ± 2.65	13.37 ± 2.60	13.46 ± 2.83	14.23 ± 2.87	78.16 ± 3.70
	Min.	30.32	7.5	9.0	8.05	73.41
	Max	40.00	17.5	19.5	20.0	87.80
2021/22	Mean ± SD	37.30 ± 2.92	14.18 ± 2.15	13.06 ± 2.59	14.93 ± 2.76	79.47 ± 3.24
	Min.	28.32	10	8.1	9.57	74.69
	Max	40.00	17.75	17.1	19.75	84.77
∑ 2018-2021	Mean ± SD	35.05 ± 3.86	11.29 ± 3.57	11.03 ± 3.83	13.91 ± 2.96	71.98 ± 7.75
	Min.	24.74	3.0	4.0	8.09	52.15
	Max	40.00	18.0	20.0	20.0	87.80

Differences in Achievement on the Entrance Exam Between Male and Female Candidates

Compared to the total sample of enrolled female (No 120) and male (No 188) candidates, the study found that female candidates achieved statistically significantly higher scores in HSS by 1.83 points (5.2%) and in SLT by 1.48 points (13.2%), $t = 4.739$; $p < 0.001$ and $t = 3.808$; $p < 0.001$, respectively. Conversely, in BPA, males achieved a better result by 2.39 points (17.2%), $t = 8.282$; $p < 0.001$. No statistically significant difference was found in GKT ($t = 0.589$; $p = 0.556$). As expected (given the meth-

od of enrollment rights at UCIPS which only considers the total number of points), no statistically significant difference was found in ∑EET points (t = -0.855; p = 0.393). In further analysis, which is shown in Table 4, differences between female and male candidates in relation to the year of enrollment at UCIPS were observed.

Table 4. *Differences Between Female and Male Candidates in All Segments of the Entrance Examby Year of Enrollment at UCIPS*

Year	Variable	Pts*	%	t	p
2018/19	HSS	1.89**	5.60	3.151	0.002
	SLLT	0.43	4.19	0.741	0.461
	GKT	-0.30	-2.78	0.488	0.627
	BPA	-2.86**	-21.08	7.149	< 0.001
	∑EET	-0.83	1.21	0.715	0.476
2019/20	HSS	1.26	3.51	1.734	0.088
	SLLT	1.97**	17.81	2.726	0.008
	GKT	-0.32	-2.63	0.434	0.666
	BPA	-2.68**	-19.10	4.792	< 0.001
	∑EET	0.22	0.30	0.165	0.869
2020/21	HSS	0.87	2.34	1.125	0.267
	SLLT	1.16	8.68	1.804	0.078
	GKT	-1.53	-11.37	1.957	0.055
	BPA	-2.45**	-17.22	3.327	0.001
	∑EET	-1.94	-2.48	1.905	0.064
2021/22	HSS	0.87	2.33	1.139	0.263
	SLLT	0.93	6.56	1.486	0.145
	GKT	-0.46	-3.52	0.616	0.541
	BPA	-1.84**	-12.32	2.293	0.027
	∑EET	-0.50	-0.63	0.536	0.595

* difference between the results achieved by female and male students

** statistical significance p < 0.05

Differences in all segments of the entrance exam were analyzed in relation to the year of enrollment individually for female and male candidates. At the general level, a statistically significant difference was found at the Wilks' Lambda level of 0.471 (F = 8.206, p < 0.001) and 0.663 (F = 6.705, p < 0.001) for female and male candidates, respectively. Statistically significant differences were observed in all segments for female candidates: HSS (F = 6.267, p = 0.001 and F = 10.821, p < 0.001), SLLT (F = 19.550, p < 0.001 and F = 12.113, p < 0.001), GKT (F = 3.298, p = 0.023 and F = 6.486, p < 0.001), BPA (F = 7.956, p < 0.001 and F = 1.451, p = 0.229), and ∑EET (F = 35.573, p < 0.001 and F = 28.208, p < 0.001), respectively. The results of the Bonferroni test for female candidates are presented in Table 5, and for male candidates in Table 6.

Table 5. *Bonferroni Test for EN Female by Year of Enrollment*

Year		HSS		SLLT		GKT		BPA		Σ EET	
		Pts	%	Pts	%	Pts	%	Pts	%	Pts	%
2018	2019	-1.48	-4.02	-2.33*	-17.96	-1.38	-11.71	-0.63	-5.64	-5.84*	-7.96
	2020	-2.35*	-6.21	-3.84*	-26.43	-1.44	-12.15	-1.06	-9.08	-8.71*	-11.43
	2021	-2.55*	-6.68	-4.42*	-29.25	-2.12*	-16.83	-2.37*	-18.18	-11.46*	-14.51
2019	2020	-087	-2.29	-1.50	-10.32	-0.07	-0.50	-0.44	-3.65	-2.88	-3.77
	2021	-1.06	-2.78	-2.09*	-13.77	0.74	-5.79	-1.74*	-13.29	-5.63*	-7.12
2020	2021	-0.19	-0.50	-0.58	-3.84	-0.67	-5.32	-1.30	-10.01	-2.75	-3.48

*p < 0.05

Table 6. *Bonferroni Test for EN Male by Year of Enrollment*

Year		HSS		SLLT		GKT		BPA		Σ EET	
		Pts	%	Pts	%	Pts	%	Pts	%	Pts	%
2018	2019	-2.12*	-5.91	-0.81	-7.23	-1.41	-11.57	-0.46	-3.28	-4.79*	-6.55
	2020	-3.37*	-9.11	-3.11*	-23.26	-2.67*	-19.91	-0.65	-4.64	-9.81*	-12.56
	2021	-3.57*	-9.57	-3.92*	-27.64	-2.28*	-17.46	-1.36	-9.11	-11.13*	-14.01
2019	2020	-1.25	-3.40	-2.31*	-17.28	-1.27	-9.44	-0.20	-1.41	-5.02	-6.44
	2021	-1.45	-3.89	-3.11*	-22.00	-0.87	-6.66	-0.91	-6.03	-6.33*	-7.98
2020	2021	-0.20	-0.51	-0.80	-5.71	0.40	3.06	-0.71	-4.69	-1.31	-1.65

*p < 0.05

Figures 5 to 14 depict trends of changes, including minimum and maximum values for various segments of the entrance exam from 2018 to 2021. The graphs illustrate trends in average values, along with trend equations for average scores on the HSS, SLT, GKT, and BPA tests, as well as the total score obtained on the entrance exam.

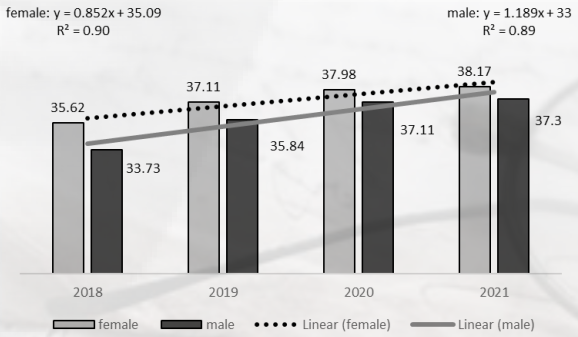


Figure 5. *Trends in Changes of HSS Average Values*

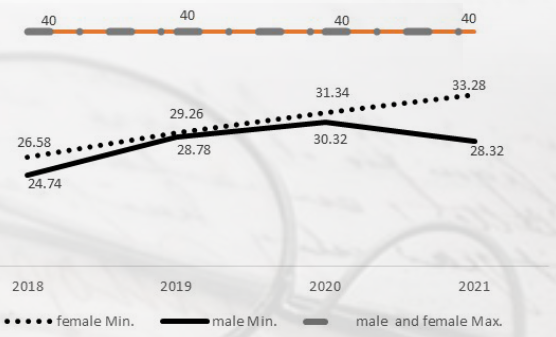


Figure 6. *HSS Min and Max Values*

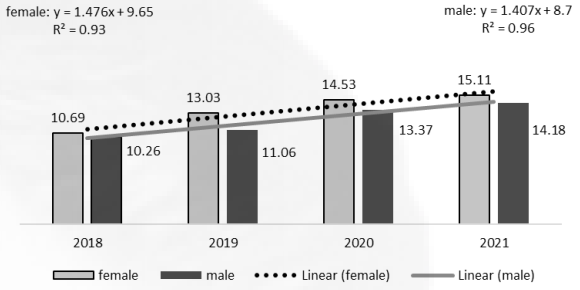


Figure 7. *Trends in Changes of SLT Average Value*

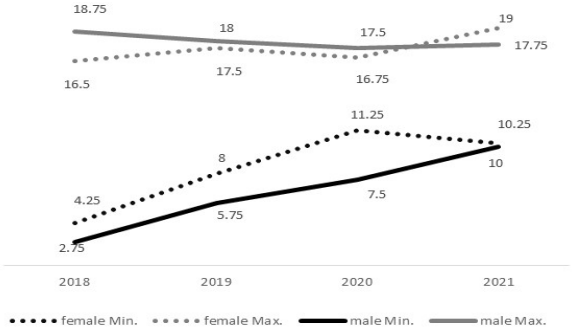


Figure 8. *SLT Min and Max Values*

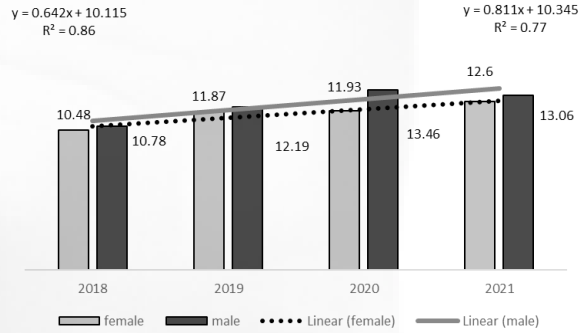


Figure 9. *Trends in Changes of GKT Average Value*

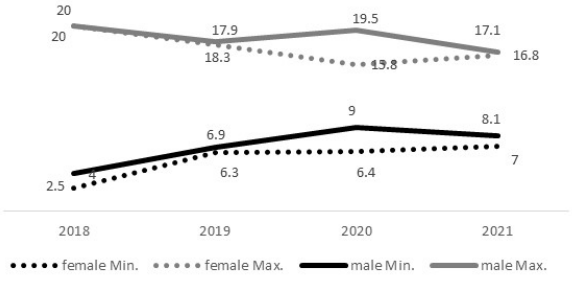


Figure 10. *GKT Min and Max Values*

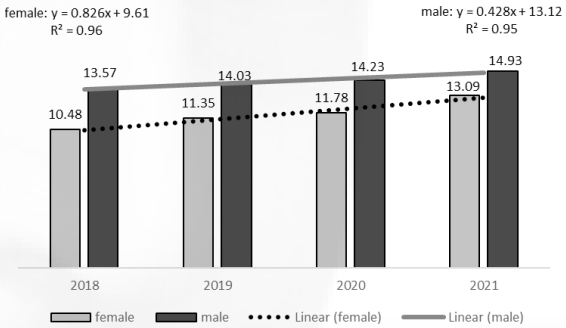


Figure 11. *Trends in Changes of BPA Average Value*

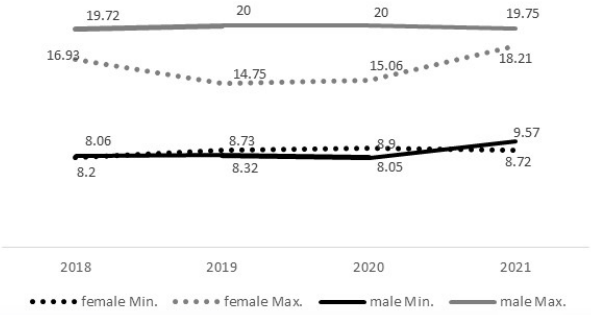


Figure 12. *BPA Min and Max Values*

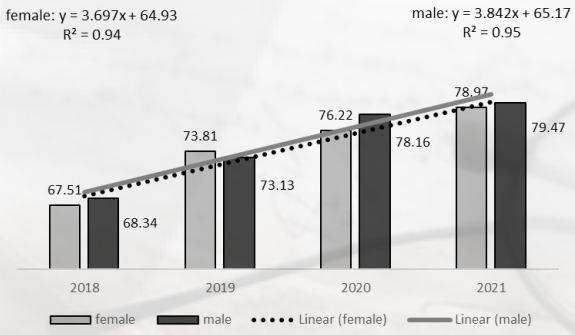


Figure 13. *Trend of Changes in Average Values of the Number of Points Achieved on the Entrance Examination Test*

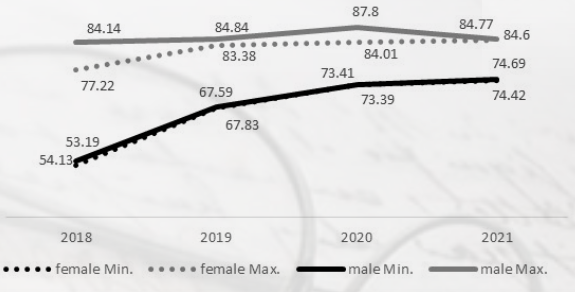


Figure 14. *Min and Max Values of the Number of Points Achieved on the Entrance Examination Test*

DISCUSSION

The main findings of this study relate to statistically significant differences at a general level in performance on the entrance exam across four observed cohorts of enrolled students of both genders (Table 5 and Table 6). It was found that there are statistically significant differences among women in all variables between 2018 and 2021. Specifically, differences were observed in SLT between 2018 and 2019, in HSS and SLT between 2018 and 2020, and in SLT and BPA between 2019 and 2021. Additionally, a difference was found for HSS between 2018 and 2019. The results from 2018 were statistically significantly lower compared to 2020 and 2021 for HSS, SLT, and GKT, while between 2019 and 2020, as well as between 2019 and 2021, better results were achieved for SLT. No differences were found for BPA among men across the observed cohorts. Also, between 2020 and 2021, no statistically significant differences were found in the observed variables among both women and men. These partial results per variables influenced ∑EET, as well as the trend of changes in all observed variables, which were found to be progressing positively. In other words, trends in changes of average values over the observed period indicate that each year, students who are admitted demonstrate higher levels of knowledge and abilities on the UCIPS entrance exam; however, the mentioned improvement has stagnated in the last two observed generations (2020 and 2021).

Analyzing the trends of average values of all tests between 2018 and 2021 for men and women shows significant improvement among enrolled students of both genders. Particularly noteworthy is the improvement in the minimum values of enrolled candidates across all tests (from Figure 5 to Figure 14). The coefficients of determination, ranging from 0.77 to 0.96, indicate a high level of consistency in growth. However, given the high set standards on all segments of the entrance exam and the total number of points, stabilization of average values can be expected in the future period. This is further confirmed by the absence of statistically significant differences between the 2020 and 2021 cohorts. Although maximum values of individual results remain similar across all generations, minimum values show growth, indicating enrollment of increasingly qualified students. One possible reason for this trend could be the increased number of applicants compared to fewer available positions in 2020 and 2021. Specifically, in 2020, 15.6% of male applicants and 15.4% of female applicants enrolled, while in 2021, 12.2% of male applicants and 17.9% of female applicants were admitted (Figure 3).

After the first generation of young women (a total of 20) enrolled in 2002, the abolition of quotas for admission to UCIPS in the academic year 2013/2014 marked another step towards establishing gender equality in educating women for police duties. The harmonization of the selection process and adaptation of selection procedure norms to the requirements of educational programs, as well as the demands of police work and criteria for performing police duties, along with a strategic approach to projecting the number of admissions, have all led to a smaller annual intake at UCIPS, while ensuring that "quality follows quantity". This means that only the best candidates are admitted, a fact confirmed by the results achieved during their studies. This finding can be linked to the improvement in the level of knowledge and skills among enrolled candidates over the four years of study, as well as the assumption that better selection contributes to the better success of students of both genders. Admission to and success during studies at UCIPS are further influenced by the specific motivation of the candidates (Meece & Courtney, 1992; Dimitrijević et al., 2014).

The findings of this study also indicate that equality has been achieved between male and female candidates in the selection process and during studies at UCIPS. Such a gender matrix would imply that students, upon completion of their studies and during employment in the police force, are assigned to appropriate positions based on their individual abilities. Previous research has shown that female candidates achieve better results in HSS and SLT compared to male candidates. This is believed to

be explainable by differences in cognitive-motivational functioning and learning styles (Janković & Koropanovski, 2017; Koropanovski et al., 2022). On the other hand, anatomical and physiological differences contribute to better physical performances among males. On average, males are taller and heavier than females, resulting in higher BMI, lower body fat percentage, and a higher protein/fat index. These differences also affect physical abilities, where males generally show better results in strength, speed, and endurance tests (Dopsaj et al., 2015; Kukić et al., 2020). Although males demonstrate greater physical achievements in absolute terms, the GPA grading system for entrance exams (and during studies at UCIPS) is adjusted by gender, providing equal conditions for students of both sexes (Koropanovski et al., 2022). Taking into account trends in changes, differences in specific segments of the entrance exam, and the percentage of enrolled students, it can be expected that BPA evaluations will also be equalized. During the observed period, a smaller percentage of candidates were eliminated due to insufficient physical preparedness (Figure 4). It can be assumed that candidates of both sexes approach the entrance exam with better developed physical abilities, which may result from greater commitment and thorough preparation for admission to UCIPS. Additionally, the ratio of applicants to enrolled students of both sexes (as mentioned earlier), along with higher levels of preparedness and greater motivation for enrollment, allows for the selection of the highest-quality candidates, thereby neutralizing possible differences between genders in cognitive-motivational functioning and learning styles.

Research shows that there are currently very few female officers in senior positions within the police force – they mostly perform administrative roles (Spasić & Radovanović, 2019). Regarding career development, women systematically focus on stagnant roles because prestigious positions often require work outside regular hours, frequent travel, and long absences from home, which hinders maintaining a balance between family and profession (Spasić et al., 2024). Research on the integration and career advancement of women in the Serbian police (Tomić, 2019) has shown that women are aware of their position but justify it with adopted values of patriarchal culture. On the one hand, they prioritize workplace safety, and on the other lack sufficient resources to change their professional and personal status in society. However, it is essential to consider the fact that there is little doubt of women's ability to perform policing responsibilities as well as men do, and they often excel in handling tense encounters without resorting to force. Female officers tend to be more empathetic toward citizens, possess better communication skills, and demonstrate greater proficiency in conflict resolution than male officers (Rabe-Hemp, 2009).

Additionally, worldwide, women are the most under-represented protected class in law enforcement today. While they make up 51% of the population, they occupy only 15-20% of positions across the nation (Deljkić et al., 2023). This is not to suggest all women would make good officers any more than to say all men would make good officers. Nor should departments lower legitimate hiring standards to attract more women, since this would only discount the value quality candidates bring to the workplace. Generally, female officers possess many unique traits that make them exceptional officers. For instance, female officers overall are more likely to be better educated. In the USA, for example, in 2013 alone, women earned 61% of associate and 57% of bachelor degrees (Perry, 2013). They are less likely to use excessive force, or to be named in a lawsuit than male officers (Lonsway et al., 2003). What is more, they have better oral communication skills and are more empathetic than men. As traditional gender roles continue to evolve, increasing the focus on female candidates could offer an abundant source of highly qualified and capable employees. Failure to do so will adversely impact agencies to reach their recruiting goals and serve their communities in the future.

One way to achieve equality in abilities, duties, and positions at work, as well as equality in general, begins with an adequate selection system and education conducted at UCIPS. Based on the presented

research results, it can be assumed that future police officers of both genders will be able to adequately respond to all professional challenges with appropriate work abilities conditioned by the positions they will work in. This emphasizes the importance of continuous improvement and adaptation of selection systems, as well as educational programs that encourage equal opportunities and promote equal participation of women in all aspects of police work based on their professional performances.

CONCLUSION

The citizen expects police officers to have the wisdom of Solomon, the courage of David, the strength of Samson, the patience of Job, the leadership of Moses, the kindness of the Good Samaritan, the strategical training of Alexander, the faith of Daniel, the diplomacy of Lincoln, the tolerance of the Carpenter of Nazareth, and finally, an intimate knowledge of every branch of the natural, biological, and social sciences. If he had all these, he might be a good policeman! (August Vollmer, 1936)

The findings of this study show a significant improvement in the level of knowledge and abilities of enrolled students of both genders during the observed four years, with a high level of consistency in the growth of average scores and individual minimum values across all segments of the entrance exam. The stabilization of trends in the last two years indicates a possible future parity in performances, driven by adequate selection and achievement of high standards in all parts of the entrance exam. Further enhancement of selection processes and adaptation of educational programs to the needs of police positions, as well as to the criteria for performing police duties, could further promote equal participation and optimal utilization of UCIPS students' achievements.

Future research should include long-term monitoring of the career development of UCIPS students, providing deeper insights into the effectiveness and long-term results of gender-balanced education regarding professional outcomes. Additionally, it would be useful to conduct a detailed analysis of motivational factors influencing candidates to apply to UCIPS, with a specific focus on differences between men and women, in order to better understand how to attract and retain high-quality and motivated candidates (students) for police work. The ultimate goal of this research would be to contribute to the development of more effective selection systems and educational strategies that can positively impact the work efficiency of police officers of both genders.

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THEORETICAL AND METHODOLOGICAL ISSUES REGARDING FEAR OF CRIME

Natasha Peovska, PhD[1]
Faculty of Security – Skopje, University "St. Kliment Ohridski", Bitola, North Macedonia

INTRODUCTION

Fear of crime is a significant sociological, criminological and psychological fact. Considerations about fear of crime both in research and theoretical contexts have been predominant in recent research in contemporary criminology (Bačanović & Jovanova, 2012). The initial research initiatives on the fear of crime began and developed in the 60s of the last century when, in addition to the attention and interest of public policy makers in determining the actual rates of crime, victimology research was also developed (Lewis & Salem, 1986, p. 4).

From the very beginning, theorists and researchers encountered numerous theoretical and methodological problems and difficulties while doing research on the fear of crime. These are perfectly understandable because fear of crime is an extremely complex phenomenon. Fear of crime is difficult to define as it can refer to opinions, emotions and beliefs that relate to the vulnerability of the individual, their loved ones and the wider community (National Crime Council, 2009). This phenomenon cannot be discussed like other material phenomena or other natural phenomena, nor like the crime rate, the death rate, etc. (Bačanović & Jovanova, 2012) That is why certain authors (Lee, 2007) believe that the fear of crime by nature and by definition is subjective (Lee, 2007), which does not mean that if it is subjective, it is also unrealistic!

According to Ferraro & LaGrange, a major problem with the conceptualization of fear of crime (1987) is the generic concept of the term "fear of crime". They suggest that crime refers to different kinds of activities and that the fear of victimization depends on the type of crime that is considered. They state that to obtain valid and reliable indicators of fear of crime, it is best to specify the type of crime to the respondent rather than leave it to his own inference (Williams, McShane, Akers, 2020). In that sense, the most comprehensive definition that reflects the fear of crime contains three aspects, ***an emotional aspect*** (or an affective aspect, if we add the indicators of unspecified fear) which is expressed in a series of emotions arising from the perception of the possibility of victimization (that is, anxiety and the intensity of the impact on the future life caused by the probability of victimization), ***the cognitive aspect*** that includes the perception of the likelihood/risk of becoming a victim as well as the severity of the consequences that could arise from the possible victimization, and ***the behavioural aspect*** that includes security precautions people take to avoid or reduce the probability and consequences of becoming a victim (Fattah and Sacco, 1989 cited in Bačanović & Jovanova, 2012). Gabriel and Greve (2003) argue that all three aspects should exceed the threshold value for a state to be labelled as fear. A person should perceive a situation as threatening and thus feel afraid (affective experience), which results in fearful behaviour (avoidance or self-protection) (Erčulj & Meško, 2022).

1 natasa.peovska@uklo.edu.mk

THEORETICAL EXPLANATIONS FOR FEAR OF CRIME

In various disciplines, numerous theoretical explanations can be found for the fear of crime. These always start with ***the concept of vulnerability.*** *This concept implies that the physical and social characteristics of the individual contribute to the fear of crime.* People who cannot run fast or lack physical strength to defend themselves from attackers, cannot afford to protect their homes, or because it will take them longer than average to recover from property and physical injuries from crime, their fear of crime will be higher (Wattanasin, 2003, pp. 22, 52). Some people perceive themselves as physically vulnerable or unable to defend themselves or their property from attack under certain conditions. Others, who are perceived as socially vulnerable, are afraid of the higher possibility of being exposed to victimization. Social vulnerability implies increased exposure to victimization because of a series of factors (Doležal, 2009, p. 59). Most often, the economic situation in combination with the level of education can influence individual social vulnerability. Thus, some persons who lack funds that would increase their personal and home security may have increased social vulnerability. Most often, social vulnerability relates to who the individual lives with, what his social relations are, how much help he has, as well as his marital status. Additionally, living in a poor neighbourhood with a high crime rate often presents an increased potential for victimization. *Major vulnerable groups identified based on these criteria can be women, the elderly, and the poor*. For example, more serious consequences are expected to occur among women, old people, as well as among people with weak or impaired health (physical factors), among victims without social network assistance (social factors), as well as in areas where assistance is not available (situational factors). When we discuss the fear of crime among elderly people, the concept of vulnerability explains that the fear can be seen as an appropriate response given the fact that they are aware of their vulnerability and resilience. First, the elderly are often not fast enough and suffer from a certain disadvantage that makes it difficult for them to evade an attacker or defend themselves against those who might attack or harass them (Skogan, 1978: 10). According to Skogan, the biggest reason for higher level of fear of crime lies in their lack of resources to deal with victimization and its consequences. O'Bryant explains that the elderly have neither good health nor time to compensate for physical and material damages and have difficulty recovering from broken bones or other serious injuries, so the effects of crime can be significantly more severe for them (Wynne, 2008). This point of view can generally explain the higher level of fear of crime among the elderly, but in any case, it is necessary to consider their social vulnerability also (whether the elderly live alone or in a community with other family members). Researchers examining differences in the level of fear of crime among the elderly have concluded that those who live in areas without social cohesion and those who are socially isolated can contribute to a higher level of fear of crime among this group (Lee et. al, 2020).

When we analyse the fear of crime among women, there is an explanation that their higher level of fear lies in their higher perceptions of personal vulnerability (Boers, 2003). Women are more likely to experience fear due to their greater physical and social vulnerability. Warr, for example, points out that "*women judge that potential victimization is serious,* and from here, despite having the same objective level of risk of victimization as men, they have a higher level of fear". *Perceptions of serious consequences can affect women to have a higher level of fear,* and this may be reinforced if the women assess that they may lose control in situations of threatened victimization such as when they lack effective defences, safeguards or opportunities to escape because they can be physically weaker than the average attacker. Often, they feel they have less control over their personal and public space and are often seen as easy targets for crime (Meško, 2007). According to Pain, women show a greater level of fear in public places than in private places, despite private places being the most common location where they are victimized. Pain also points out that there is a higher level of fear of crime among younger women than among older ones. That is, the more helpless a woman feels, the higher is their fear of crime (Meško, 2007).

As a conclusion, this concept of vulnerability refers to the interaction of the following three factors: probability of victimization, severity of the foreseen consequences, and a feeling of not having control over the first two factors (Tolle, 2001 cited in Doležal, 2009). This theoretical concept is most often considered when examining a socio-demographic model, in which it is assumed that sociodemographic characteristics determine people's fear of crime.

The second concept of fear of crime refers to ***the victimisation concept,*** which considers that fear is caused by high crime rates that lead to a high level of fear of becoming a victim (European Crime Prevention Network, 2004). According to this concept, the fear of crime is seen partly as a product of experience with victimization. Personal experience of victimisation or finding out about another's experience of crime (through family, friends, relatives, acquaintances and from the media) can influence the emergence of fear of crime. The thesis of imagined victimization and the psychology of risk indicates that the fear of victimization exists when individual imagine themselves in such a situation, which can contribute to the emergence of a feeling of personal vulnerability (Ruuskanen, Jokinen, Yordanova, Markov, & Ilcheva, 2009, p. 183). Regarding the connection between personal victimization and the fear of crime, studies show mixed results (Jovanova & Trajanovska, 2013). Some authors in their research found a strong relationship (Scott, 2003; Tseloni & Zarafonitou, 2008, Fox, Nobles & Piquero, 2009; McNeeley & Stutzenberger, 2013 cited in Köseoglu, 2021) while some others found that such a relationship either does not exist or is quite weak (Lee, 1982; Quann and Hung, 2002, Curiel & Bishop, 2018). For indirect (vicarious) victimisation, there are research results that show a strong relationship with the fear of crime (Doležal, 2009). The research conducted in Finland found out that the young residents who had an indirect experience with crime (some of their friends were victimized) have a higher fear of crime, and among the elderly, the fear is higher when they have indirect experience through news and rumours (gossip) (Ruuskanen, et. al., 2009). Clarke and Lewis (1982) have determined that indirect victimization perhaps is not enough to generate fear, however, it is a significant source of information for the crime that affects the perceptions of the individual for the safety in the neighbourhood and these perceptions can affect the individual assessment of the risk from victimization (Wattanasin, 2003).

The third concept is ***social control***, which considers that the fear of crime is caused by the feeling of lack of social control. This concept covers concerns about perceived disorder in the community and increasing social disorder (European Crime Prevention Network, 2004). This concept is based on the fact that the lack of social control is a greater source of fear than the objective risk of victimization. Therefore, neighbourhood disunity and criminality in that area is only a manifestation of the social disorder that can have a disturbing effect on the residents. The present physical signs of disorganisation or disorder (bad facades, neglected parks, scattered garbage) suggest a lack of care and an absence of informal social control that can lead to a bad resident's perception (Doležal, 2009). Lack of social trust and informal social control is considered to greatly worsen feelings of safety and increase perceptions of risk in their environment (Ruuskanen, et. al., 2009).

There is also ***an ecological concept*** that analyses the impact of space on fear of crime by associating irregularities in the space with social problems (Sipahi, 2022). This concept relates fear of crime with the place of residence, arguing that fear of crime is associated more with urban than rural environments and that research data shows that inner-city residents report a higher degree of fear of crime than the residents of the peripheral parts of the city. Some authors connect the city's physical appearance with the level of fear of crime, indicating that the design of the environment in which they live can play a positive role in the perception of citizens. Within the ecological concept framework, certain characteristics of social relations between residents in the environment are stated and connected with the level of fear of crime. Accordingly, it is considered that social integration, social cohesion, satisfaction with

the neighbourhood and the feeling of loneliness may have a direct impact on the level of fear of crime. But in this case, there can be discussion whether the fear of crime would be a dependent or independent variable, whether the fear of crime results from disturbed social cohesion, solidarity, and integration in the neighbourhood or whether the fear of crime is one of the reasons for the appearance of these neighbourhood changes.

All previously elaborated concepts are introduced in the social demographic model for an explanation of fear of crime. But there is another model that introduces a psychological dimension when explaining the fear of crime (Meško, Areh, & Kury, 2004). Warr's study (1982) explains how contextual variables have an indirect influence on the fear of crime through individual perception. In that sense, sometimes research results show that the fear of crime is more correlated with the perception of a high crime rate rather than the official data for crime rate. Van der Wurf and his collaborators are guided by the concept of a defended space as a space in which the situation itself is perceived by possible victims as ideal for criminal activity. This model is also called social psychological, which includes the perception of the individual to what extent 1) he sees himself as ***a target (the attractivity component) 2) the criminal intent of other individuals or certain groups (the evil intent component),*** relates to the wrongdoer's role in the phenomenon and is represented by the extent to which a person attributes criminal intentions to another individual or particular group; 3) the degree of self-assurance and feeling of control that a person has concerning possible threat or assault by another. In principle, it is a question of two related sub-factors: one's own power and the power of the other (**the power component**); and 4) ***criminalized area***, that has to do with the situation in which a crime may take place. The emphasis is on characteristics of place and time and the presence of others. It is a question of the extent to which a situation lends itself to criminal activities in the eyes of a possible victim, i.e. of how much the situation facilitates crime or the attacker/offender (Meško, et. al., 2004). This research is the first one on the fear of crime in the field of psychology that highlights the importance of the way how we perceive ourselves, others and the world in which we live in terms of the emergence of fear of crime.

The trend in further research and explanations should be directed more towards an interactive model of fear of crime explanation (Boers, 2003, p. 16), without looking for a causal effect, given that previous theoretical explanations for fear of crime are not adequate for such complex, interactive relationships whose overall structural and processual context characterizes the phenomenon of fear of crime.

MEASURING FEAR OF CRIME

There is considerable theoretical confusion regarding the meaning and measurement of fear of crime. This confusion has a long history. More broadly, is "fear of crime" simply a measure of fear of crime, or is there perhaps some other attribute in addition to it that might be better characterized as "uncertainty that comes with modern living" "quality of life" "perception of disorganization " or " urban care" (Wattanasin, 2003:41).

There is a history of doubts and dilemmas about the validity and reliability of measuring fear of crime. Even at the beginning of the research on the fear of crime, the operationalization and measuring were faced with certain difficulties, originating primarily from the existing dilemmas regarding the theoretical determination of the fear of crime. Some of the theorists believe that when we measure the fear of crime, the questionnaires used as an instrument, are too direct to effectively determine the public's perceptions of crime (Jackson, 2005, p. 298) and their level of the fear of crime.

Other criticism relies on the fact that the fear of crime was measured through a single indicator, which could not cover all segments of the fear of crime as a complex phenomenon, nor could it be tied to certain criminal acts. Ferraro argues that, in numerous research studies, the fear of crime is measured and analysed through one indicator and most often as a global measure (May et al., 2004). Generally, fear of crime was measured only through the following question: "How safe do you feel walking alone at night in your area/neighbourhood (or around)?" Criticisms of this question point to the fact that the question fails to separate the fear of crime from the risk of victimization and general fears that are not necessarily related to the fear of crime (National Crime Council, 2009:10). Garofalo, among others, points out that none of these global questions mentions crime specifically; for example, the question refers to crime implicitly instead of explicitly (Wattanasin, 2003). This kind of question cannot express the specificity of the fear of crime as a phenomenon, as it can artificially raise the level of its occurrence because through these questions the emotions of anxiety are generalized, and no distinction is made between the emotions arising from different kinds of crime. A respondent's feeling of unsafety walking around alone at night could be a result of the fear of dark, fear of dogs, or simply fear of being alone (Dozier, 2009). Additionally, what exactly "neighbourhood" or "some areas" mean is still open to different interpretations by different people. Third, respondents who are asked about their perception of safety when they are out alone, maybe is an activity that can be rare for many of them. This would be quite relevant, especially for old people (Dozier, 2009, p. 44). It is thought that this way of asking the question may generate higher levels of fear of crime or feeling of unsafety among women and old people than among men and young people. For that reason, in addition to this question, which would in one way measure the general fear of the individual, other standard questions for operationalization can be related to their concern regarding specific crimes, their perception of the likelihood of victimization and possible consequences for them in case they become a victim of a specific crime (Sessar, 2008).

Considering all the above mentioned, the question is whether the questions used are correct and/or whether there are factors other than crime that can activate the fear of crime. Such questions can also be criticized from the point of view that emotions can be present, but they can be at a low level, or they can appear strongly but be transient (Jackson, 2005). These questions do not consider the situations in which fear of crime appears, its frequency and its intensity (Ferraro and Gadd, 2004) or they do not investigate when, where and with whom the fear of crime appears nor how often the respondents reported that they felt fear. Some researchers even have concerns about the respondents' ability to accurately express their fear of crime (National Crime Council, 2009, p. 11). For example, the male respondents can show less fear of crime, in an attempt to be consistent with the social pressure to appear stronger and more self-confident in the society.

According to Ferraro and LaGrange's (1987) perceptions of crime can be separated into three categories: judgments (about the risk of crime), values (concern), and emotions (fear)" (Etopio and Berthelot, 2022 cited in Saker et al, 2023). Measures from the first group examine the cognitive evaluations or perceived possibilities of becoming a victim of crime. The second group of measures requires values or the level of concern about crime/victimization, and the third set examines the emotions that can arise from the possibility of becoming victim. Because the authors defined the fear of crime as "a negative emotional reaction to crime or the symbols associated with crime", they argued that the fear of crime should be limited to the emotional component, maintaining that it is "conceptually distinct" from concern and perceived risk. But, if the fear of crime is conceptually limited to an emotional reaction caused by the signs of crime, many researchers call it the fear of crime, but in fact *they measure judgement* (Krannich, Berry, & Greider, 1989; Rountree & Land, 1996; Wilcox, Quesenberry, & Jones, 2003), *or values* (Lane & Meeker, 2000) *or a mix of both* (Block, 1971; Conklin, 1971; Doob & Macdonald, 1979; Lewis & Maxfield, 1980; McCoy et al., 1996 cited in Van Beek, 2004). This approach of

the authors can jeopardize content validity, in terms of representation of the entire construct (Haynes et al., 1995 cited in Etopio, 2022). In other words, the measure does not represent the entirety of the fear of crime construct (Etopio, 2022).

Fattah and Sacco (1998) try to introduce some clarity regarding the definition through which the fear of crime can be properly operationalized and measured. They first note that fear is both a psychological and an emotional response to a threat, but the researchers exclusively emphasize the emotional aspect of the fear of crime. Second, what they underline is that "the answers to general questions refer more to the assumed or expected than to the real fear". For clarification, they suggest empirical measures that can be grouped into three broad categories, **cognitive**, **affective**, and **behavioural**. Cognitive are those that attempt to measure fear by determining the respondents' beliefs regarding the extent and possibility of criminal victimization. In this category, Fattah and Sacco include not only questions that refer to the level of local crime but also those that require the respondents' assessment of the possibility of becoming a victim of specific crimes (Wattanasin, 2003, pp. 46-47). In this aspect, Warr (1984) developed a 16-item measure that asks participants to indicate their level of fear of different crimes (Etopio, 2022). The authors in the affective aspect of the fear of crime include several global measures, Figgie's unspecified fear, and questions involving concern about the fear of becoming a victim of specific criminal acts, or according to Figgie's terminology "specific fear". Measures that measure the affective aspect of fear have no objective external reality to which they can be compared. Therefore, it is not possible to talk about whether the answers to such questions are irrational or unjustified. Fattah and Sacco introduce measures that measure fear through people's behaviours (a behavioural aspect of the fear of crime). For example, Ollenburger asked a question that refers to the extent of security measures that are needed for the individual to feel protected or as a reaction to previous victimization. These behavioural measures were added to the other two indicators, affective measures of unspecified fear and cognitive measures. However, the authors emphasize that behavioural measures do not tell us how respondents really behave, but how they say they behave. It is still argued that these behaviours may be more consequences than indicators of the fear of crime (Van Beek, 2004). Perhaps this is the most appropriate operationalization of the fear of crime, which despite all certain remarks, can be accepted as the most appropriate when we measure such a complex phenomenon.

In the last two decades, in the questionnaires about the fear of crime, questions related to the media are also introduced, to determine the relationship between them. However, in this part, there are certain dilemmas about the formulation of the questions about the media. For example, it is not only important to gather information on how much the media are consumed, but for what kind of purposes they are mostly used, what information respondents receive and the intensity of daily consumption of crime-related information. Furthermore, the questions related to the type of media and the media credibility should be included to improve the operationalization of the connection between the media and the level of fear of crime (Jovanova & Bacanovic, 2012).

CONCLUSION

Fear of crime is a very complex phenomenon that always causes dilemmas regarding definition, theoretical explanation and measurement. In that sense, there are still discussions as to whether fear of crime is an emotion, opinion or belief about the vulnerability of the individual. Considering that fear of crime is researched in many different disciplines (within criminology, victimology, sociology, psychology, or psychiatry), there are different definitions of fear of crime. One of the most comprehensive definitions (Fattah & Sacco, 1989 cited in Bačanović & Jovanova, 2012) that reflects the complexity

of the fear of crime, contains three aspects, an emotional aspect (or an affective aspect, if we add the indicators of unspecified fear), the cognitive aspect that includes the perception of the likelihood/risk of becoming a victim as well as the severity of the consequences that could arise from the possible victimization, and the behavioural aspect that includes security precautions people take to avoid or reduce the probability and consequences of becoming a victim.

Many theoretical explanations about the fear of crime can be found in the relevant literature, which can contribute to the explanation of such a complex phenomenon. Generally, the fear of crime is explained by the concept of vulnerability, victimisation concept, social control, and ecological concept. These concepts are part of the social demographic model, but recent research has introduced and tested the social psychological model based on the model of Van der Wurff et al. (1989). Further research and theoretical explanation should be directed toward interactive models as more adequate models for the explanation of the fear of crime.

The complexity of the fear of crime also poses numerous methodological challenges in terms of measuring. However, through a critical review of the existing knowledge and research on the fear of crime, some methodological aspects can be improved to obtain more reliable data on the fear of crime as a significant indicator of people's feeling of safety in society.

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ACTIVELY LISTENING TO REISS

Jovan Božović[1]
The Agency for Prevention of Corruption, Belgrade, Serbia

INTRODUCTION

Active listening consists of several stages: we hear, we carefully process information, we think about it, we are interested and, finally, we understand it. All the mentioned stages require patience. Since people today are increasingly dissatisfied, it is logical that they are also more impatient. It is the same with corruption. In both situations, the result is similar. Impatience and dissatisfaction are growing, so that someone else is always to blame for corruption. It is easy, in this way, to find yourself in a vicious circle. For this reason, it would be very useful if we once again actively listen to Reiss's warnings and act together proactively in the prevention of corruption.

There is no state, from ancient times to modern times, that has not faced the phenomenon of corruption. Namely, the evolution of corruption is, as historical facts show, symbiotically connected with the creation and development of the state (Božović, 2022:299). The paper will briefly show the socio-historical context in which Reiss wrote his book, then discuss some of the emerging forms of corruption that he pointed out, and finally, by actively listening to Reiss, give some ideas for the improvement of modern anti-corruption measures within the corruption prevention framework in Serbia.

Serbia was granted state independence in 1878 - at a time when less than one fifth of today's states enjoyed such a status. Four years later, it was declared a kingdom. With the liberation of Kosovo, Metohija, the areas of Novi Pazar and Vardar Macedonia in 1912 and after the annexation of Banat, Bačka, Baranja and the Kingdom of Montenegro, Serbia together with the unrecognized state of Slovenes, Croats and Serbs established the first Yugoslav state - the Kingdom of Serbs, Croats and Slovenes (Kingdom). In 1929, this kingdom was renamed the Kingdom of Yugoslavia (Antić, 2021:12-13). During the existence of the Kingdom, corruption was indeed a significant problem. The newly formed kingdom faced challenges in establishing strong governance structures and combating corruption due to various factors such as regional disparities, ethnic tensions, and a lack of institutional capacity. The nascent institutions of the kingdom struggled to establish effective anti-corruption mechanisms. Lack of transparency further facilitated corrupt activities among officials at various levels.

Dr Archibald Reiss (1875-1929), Swiss forensic scientist, publicist, doctor of chemistry and professor at the University of Lausanne, participated in the creation of that history. Namely, during the First Balkan War in 1912, Reiss was a reporter in Thessaloniki. At the invitation of the Serbian government, Reiss came to Serbia in 1914 to investigate the crimes of the Austro-Hungarian, German and Bulgarian armies against the Serbian civilian population, about which he wrote many reports, papers and books. In this regard, as an expert on war crimes against Serbs in the First World War (WW I), he was a member of the government delegation at the Paris Peace Conference. He crossed Albania and the Thessaloniki front with the Serbian army. In the post WW I era he modernized the forensics of the Ministry of the Interior and was the first director of the Police School in Belgrade.

1 jovan.bozovic@acas.rs

BRIEF OVERVIEW OF REISS'S WARNINGS

Archibald Reiss had a significant role in the Serbian society in the post WW I era. Among many things he did for Serbia and the Serbs, he left his political testimony and moral reflection over conditions in the Serbian society, especially about the political actors, institutions, and political culture and practice (Stanković, 2018:56).

The set of Reiss's insights were exposed in his short book "Listen, Serbs!", posthumously published according to the author's will. The book was written in 1928, and was dated June 1, 1928, a little more than a year before his death. The first edition waited for decades to be published. "Listen, Serbs!" got its first edition in 1997, but in the end, the work in its integral part was published in the Serbian language and distributed free of charge in 2004. The book is divided into five parts: Virtues, Flaws, About Intelligence, About Politicians, and About Youth.

Reiss's analysis is not uttered in the form of a scientific system. It is a set of direct observations and critical judgments. It encompasses description, explanation, and critical assessment of the political events, social processes, and political and social actors. As it was pointed out in sociological literature, Reiss made a concise and fruitful overview of political values, moral orientations, and psychological profiles of all social strata in Serbia in the post WW I era (Šuvaković, 2019:354).

Based on the book itself, we can conclude that Reiss was a conservative, traditionalist, meritocrat and populist - he opposed women's education, parliamentarianism and the abandonment of the countryside; believed that a successful country should develop on agriculture and glorified the Serbian peasant.

Although Reiss conceived the book as a warning, writing about the virtues and faults of Serbs, what interests us in this paper are Reiss's warnings about corruption. His recognition of corrupt actions is close to the modern understanding of corruption, regardless of the fact that, according to the time in which he lived, he does not use modern terminology. This is how he writes about the venality of the "intelligentsia", from the smallest official to the minister (Rajs, 2004:38-39), recognizing actually administrative and political corruption, while also finding mitigating circumstances in the *culture of corruption* inherited from the Ottoman Empire.[2] He recognizes and describes the conflict of interests of Milan Stojadinović, who as the Minister of Finance uses insider information for his own enrichment and the enrichment of persons connected to him. Writing about the enrichment of ministers after coming to public office, he actually points to the lack of mechanisms for reporting the assets and income of public officials and checking their lifestyle. He points to post-war patrimonialism, which enabled the "intelligentsia" to "shamelessly plunder" state property, making it "a hotbed of rot and corruption". Writing about politicians, he points to various forms of political corruption, the basic characteristic of which is "struggle for power". Although formally only two parties bear the name "Corruption"[3], Reiss actually writes a lot about different forms of political corruption, giving them appropriate names at the time, which essentially correspond to the nature of the described corrupt actions - "party connections", "party police", "downfall of parliamentarianism", "abuse of elections". In

2 In this context, we should not forget what Reiss does not state: that in fact the social arrangements of Antiquity can be considered the generators and roots of corruption in Europe. Namely, those social arrangements were based on the cumulation of the functions of rulers and officials, which enables a conflict of interests; competences established in a way that allows for exceptions in application; discriminatory provisions of the regulations depending on the status of the individual and the discretionary basis for decision-making by the ruler and his officials (Božović, 2024).

3 In comparative practice, the definition of the World Bank is most often used, according to which corruption is the "abuse of public authority for the purpose of obtaining private benefit", and at this point we will remind you of the only legal definition of corruption in our law, provided in the Law on Prevention of Corruption, according to which corruption is "a relationship arising from the use of an official or social position or influence in order to obtain an illegal benefit for oneself or another" (Božović, 2024).

the end, he blames Nikola Pašić for all of the above, whom he believes served as an example for those and such politicians. He describes the virtues of the Serbian people, but emphasizes the flaws as well, wanting to warn the Serbs to return to the virtues of which he was convinced during the war. In this context, he ends the book referring to the "spirit of Kosovo, Karađorđe, Kumanovo and Kajmakčalan", which needs to be reawakened (Rajs, 2004).

Did Reiss spare anyone in his merciless criticism of the political establishment of the day? Yes, King Alexander. He does not want to see the simple fact that the regime inaugurated by the Vidovdan constitution in 1921 established such an organization of the competences of central government bodies, which "deformed the constitutional principle of parliamentarianism, and negated the essential features of the parliamentary regime". This is supported by the fact that out of 23 governments, only two were replaced by the will of the National Assembly, and all the others by the ruler. After all, the same remark that Reiss makes to Pašić regarding getting rich could be made to King Alexander. The Swiss is silent about it - probably out of respect for Alexander's war merits (Šuvaković, 2019:342).

At first glance, it seems that Šuvaković is right. However, although Reiss did not explicitly mention King Alexander, he, as an experienced forensic scientist, implicitly "left a trail" that leads to King Alexander by pointing to ministers who became rich after being elected to public office. Namely, according to the available information, on the one hand, it was with some of the mentioned ministers that the king was involved in several corruption scandals, and on the other hand, without cooperation with the ministers of finance, he would not have been able to acquire numerous real estates and real wealth at the expense of the budget. We will mention only three examples.

Every year, the King received certain funds to cover the needs of the royal family and the court. It was called the "civil list", which was even doubled by various machinations to the detriment of the budget, but it was "not discussed". In addition, the king had the privilege of not paying taxes. According to the law, from 1928 onward, the tax was a duty that was not paid by the ruler on his private property. However, the law was so ambiguously formulated that, beyond the purpose for which it was enacted, the king's enterprises operating on a purely commercial basis were also exempted from paying taxes. In this area His Majesty the King's Civil House Act was the culmination of abuses and corruption. The entire court staff was given the position of civil servants, so instead of being from the "civil list" they were financed from the state budget (Bartoš, 1951).

The king became the owner of a large number of real estates, the acquisition (buildings or land), construction and/or furnishing were to a greater or lesser extent fully financed from the budget. The state first bought and furnished the castle of Prince Windischgretz in Bled, and then presented it to the king as a recognition for his wartime merits. The local authorities maintained the property at their own expense. In a similar way and under similar conditions, the estate in Han Pijesk, the castle of Archduke Fridrih of Belje, the castle in Zagreb, Demir gate, Morović and Miločer were presented to the king. Such solutions were made possible through "anonymous" financial laws, which contained a provision that read: "Decisions of the Ministerial Council are accepted and approved." After that, all individual decisions would be listed, with the number and date of adoption, but without any possibility for someone to inspect their content (Bartoš, 1951).

Perhaps the most significant of all corruption scandals, which generated enormous interest in its time and for which it was claimed that Alexander himself was an indirect actor, is The War damage scandal. This whole affair was very well known to Aleksandar, since the public was buzzing about it, but Stojadinović was calm, because he knew how much Aleksandar used the insider information he entrusted to him. The palace administration was one of the buyers of war damage, following "insider information", which according to Bartos was irrefutably established (Bartoš, 1951).

Of Reiss's warnings, we selected a few that we will mention and that will actually serve us to present ideas for improving the valid normative framework in Serbia in the same areas - conflict of interest, control of income and property of public officials, corruption proofing on regulation and anti-corruption education of young people.

Writing about venality as a trait of the "intelligentsia", Reiss states that numerous Serbian ministers have enriched themselves at the expense of the state by abusing their positions, and as the most typical example he cites Stojadinović, the Minister of Finance, who decides on the fate of war damage bonds, whose nominal value of 1,000 dinars fell to 50 and less, because the state did not pay the interest. During that period, he bought huge quantities of these bonds at a negligible price and, when he collected most of them for himself, he announced as a minister that the interest would be paid. At the same time, the bond rose to 250 dinars and more, and Stojadinović becomes a multimillionaire (Rajs, 2004:36-39).

Reiss states that from the war to 1928, he saw at least fifty ministers who became rich, even though they were poor before taking office, and he cites Vukićević, Lazar Marković, Boža Maksimović, Nikola Pašić, Velizar Janković, Momčilo Ninčić, Milan Stojadinović, as typical examples. In doing so, he not only mentions the huge property they acquired during the exercise of their duties, but as an experienced crime investigator he also points to their lifestyle, which far exceeds their legal income - huge monthly expenses, carefree gambling and losing large amounts of money, shopping exclusively in Paris, etc. (Rajs, 2004). In that period, in the Kingdom, as well as in the rest of the world, there were no anti-corruption measures that would enable the control of property and income of public officials. The absence of those measures in the mentioned period, on the one hand, and the enrichment of public officials, on the other hand, perhaps best indicate the necessity of improving the control of property and income in the present time.

Reiss had a very negative opinion of the assembly, claiming that laws are not debated and voted on following state and national interests, but the interests of political parties. As an example, he mentions the occasion when the assembly or the "parliament of slackers" urgently passed a law in 1914 exempting MPs from military duty, which made them unique among all their counterparts from the countries participating in the war (Rajs, 2004:62-63). Bearing in mind the previously mentioned laws that were passed so as to benefit primarily the monarch, and not the state and the budget, it is obvious that there was no mechanism for assessing the risk of corruption in the regulations in the Kingdom. A detailed analysis would probably reveal the existence of corruption risk factors in other regulations from that period as well.

From the way of writing and the character of the sentence, one gets the impression that he conceived his text as an alarm and at the same time as a call for critical reflection and urgent social action. However, for the sake of his scientific dignity and the possible political consequences, Reiss abandoned that intention (Petrović, 2019:321). The consideration of alternative directions in history originates from Greek philosophy, but writing alternative history is not new in the world. Counterfactual speculations in contemporary historiography are becoming more and more popular (Marković & Antić, 2021:13-19). Let us consider counterfactual history, in which Reiss publishes his book in 1928. It seems completely natural and human to wonder if we could have done better, all in order to avoid mistakes in the future. The question arises whether his warning would have been heard and listened to, and whether the publication of the book would have changed anything in the fight against corruption in the Kingdom.

From the moment of unification until 1928, political and inter-ethnic conflicts in the Kingdom intensified to a significant extent conditioned by the difficult economic situation, and were followed by more and more serious incidents in the parliament. In this context, we should not forget that on June 20, 1928, during the session of the National Assembly of the Kingdom, where various accusations of treason and corruption were heard, two MPs from the ranks of the HSS were killed, while the third

died of injuries a little over a month later. In addition, from November 6 to 12, 1928, the Fourth Congress of the Communist Party of Yugoslavia was held in Dresden, where the policy of destroying the Kingdom and creating independent national states was formulated. The collapse of the New York stock market and the economic crisis quickly spread to Europe, leading to a major crisis of democracy and the rise of totalitarian regimes. This further worsened the entire situation in the Kingdom. In such circumstances, the question of the survival of the state comes to the fore. After the murder, there was a major crisis, and on January 6, 1929, King Alexander suspended the Vidovdan Constitution and imposed a personal regime, making any legal political work impossible. Would a book like this change something in the Kingdom in terms of the fight against corruption, considering that in the observed period there was more talk about the civil war and the issue of amputation of part of the state territory? It would very likely serve as an additional justification for the introduction of a dictatorship, but it is hard to believe that it would lead to systemic changes or the prosecution of any of the ministers mentioned in the book. Reiss was certainly aware of the circumstances in which the Kingdom found itself at the time of the completion of his manuscript. We believe that he decided not to add fuel to the fire, knowing that his work would not produce the fundamental changes for which he wrote the book.

ARCHIBALD REISS FOR THE SECOND TIME AMONG THE SERBS

The first edition of Reiss's book that was published in its integral version in the Serbian language and in Serbia and distributed free of charge came only in 2004, many years after Reiss's death. Moreover, it is questionable how much of his writing was understood. Namely, that same year, representatives of the Government, the Ministry of Economy and Privatization and the Privatization Agency rejected the findings of the Anti-Corruption Council on the policy and process of privatization. Mirko Cvetković's government rejected all objections regarding privatization and transferred to the Council "an unacceptably low level of expert knowledge of the matter, numerous material errors and untruths, etc.".[4] Without going into the question of the quality of the Council's report at this point, the attitude of the then government about the inviolability of privatization and those who implemented it is much more significant. We still feel the consequences of such an attitude and such privatization today. It seems that the Government of Mirko Cvetković neither heard nor listened to Reiss's warnings to the Serbs.

What improved this poor start of active listening to Reiss was the ratification of the UNCAC and the adoption of the first National Strategy for the fight against corruption in 2005, as well as the creation of a normative and institutional framework for preventing corruption by passing key laws and establishing independent bodies – the Commissioner for Information of Public Importance, Ombudsman, State Audit Institution, and the Agency for the Fight against Corruption (now the Agency for the Prevention of Corruption – APC), started working on that wave in 2010, as a central institution in the prevention of corruption.

For example, Serbia has a normative framework that regulates the reports on the assets and income of public officials (hereinafter: the Report), prescribed by the Law on Prevention of Corruption, as one of the instruments for the fight against corruption. The obligation to submit the Report generally applies to all public officials, except for those who are explicitly listed as exceptions in Article 70 of the aforementioned law, and who do so only at the request of the Agency. The obligation to submit the Report also applies to persons who have ceased to hold public office, two years after the termination of public office. Article 101 of the aforementioned law prescribes the criminal offense of not declaring assets and income or providing false information about assets and income, which is punishable by a

4 https://www.arhiva.srbija.gov.rs/vesti/2004-01/23/343098.html. Downloaded 29.06.2024.

prison sentence of six months to five years. After the verdict of imprisonment for this criminal offense becomes final, the following legal consequences occur: 1) termination of public office/employment and 2) prohibition of acquiring public office for a period of ten years.

In addition, from the point of view of corruption prevention, the upcoming adoption of the third National Strategy for the fight against corruption is particularly significant. The first National Strategy was adopted in 2005, and the second in 2013. After a period of six years without a National Strategy, in which other strategic documents (action and operational plans) were used, Serbia will receive a new National Strategy for the period 2024-2028. The national strategy is planned to be implemented through the Action Plans 2024–2025 and 2026–2028. The strategic prevention of corruption in Serbia will be conditioned by its implementation, and the last year of the National Strategy's validity will be a good opportunity to once again ask the question whether we actively listened to Reiss, 100 years after the creation of his book.

PROROPOSED IDEAS / THE YEARS AHEAD

The relevance of Reiss's findings at that time is great. By reading the study, one not only gets a credible impression of the decline of society at that time, which is supported by later works in the field of history, as well as by historical sources of the first order, but inevitably notices a parallel with the current state of affairs in Serbian society (Šuvaković, 2019:331).

The 2006 Constitution of the Republic Serbia (CRS) contains several anti-corruption provisions, among which we can distinguish three types: the first refers to the conflict of interest, the second refers to the incompatibility of functions, and the third refers to the audit of public finances. Among the first, the most significant prohibition of conflict of interest in Article 6, was raised to the rank of a constitutional principle, which stipulates that no one can perform a state or public function that is in conflict with his other functions, jobs or private interests, and that the existence of a conflict of interest and responsibility for its resolution are determined by the Constitution and the law. Although the mere existence of such a principle is rare in constitutional practice and extremely important for the prevention of corruption, its deficiency is actually reflected in the stylization. It seems that wording like "it is prohibited" would prevent the relativization of this constitutional principle in legislative practice. (Božović, 2023:86).

The concept of conflict of interest is defined in a slightly different manner in Article 41, Paragraph 1.1. of the Law on Prevention of Corruption (LPC), so that the term means a situation in which a public official has a private interest that influences, can influence, or appears to influence the performance of a public function. In addition, this law does not distinguish between state and public functions, but treats all functions exclusively as public.

The principles of the constitution are the most general and basic political and legal principles on which the state is based, and more broadly, the entire political life in a country. Constitutional principles are the guardian of the constitution and constitutionality because they prevent the ultimate outcome of the implementation of the constitution by state bodies from being a violation of the constitution (Vučković, 2022). The importance of the prohibition of conflicts of interest as one of the instruments that ensures respect for the principle of separation of powers and the rule of law is the reason why the prohibition of conflicts of interest is prescribed in the Constitution as the highest legal act. The prohibition of conflicts of interest is general. It refers to any person who performs state or public functions (Pajvančić, 2009:19). However, the wording of the principle of prohibition of conflicts of interest

in Article 6, paragraph 2 of the CRS is an example of an incomprehensible "and illiterate" provision, and it remains unexplained what the CRS means by "state" and what by "public" function (Markovi ć, 2006:9). During the elaboration of this constitutional principle, the provisions of the Law on the Anti-corruption Agency completely ignored the existence of state functions, from which it follows that there are only public functions, for which there is no constitutional basis. The aforementioned inconsistency was not removed even upon the adoption of the LPC. The *rationale* behind this remains completely unclear.

In accordance with the above, for the sake of consistent application of the constitutional principle on the prohibition of conflicts of interest, the LPC should first define the concept of state function, and then redefine the concept of public function in accordance with that definition. Since 2008, when the Law on the Anti-corruption Agency was adopted, not only was the definition of state functions omitted without a constitutional basis, but the concept of public function was over-sized in populism, which was not correlated with the projected capacities of the APC. In this regard, the LPC in 2020 did not bring anything new either.

In this manner, the current situation would be avoided, in which, first in 2008 and then in 2020, the provisions of the Law on the Anti-Corruption Agency and subsequently the LPC comprise an overly broad definition of the term public official so that at the present moment there are slightly more than 44,000 active public officials in Serbia, because public officials include at the same time a member of the board of directors of the library and the president of the Government of the Republic of Serbia (Božović, 2023:86).

Of course, such changes to the LPC should not be an end in themselves, in order to consistently develop the constitutional principle of prohibiting conflicts of interest. Based on the explicit provision of state functions as a special category, we believe that the goal of the constitution maker was not to apply the same legal regime of supervision and control by the APC to these two groups of functions.

It is logical to assume that the idea of the constitution maker was that state functions refer to state bodies at the republic level (an authority of the Republic of Serbia), as well as to institutions, public enterprise and any other legal person whose founder or member is the Republic of Serbia. Accordingly, public functions would include authority of an autonomous province, local self-government unit and city municipality, as well as institutions, public enterprises and any other legal person whose founders or members they may be. In this sense, the definition of the state function and the demarcation in relation to the public function should be accompanied by a change in the Agency's focus, which would be predominantly directed at state functions. At the same time, this would contribute to the APC exercising its responsibilities in a shorter time frame, more efficiently and effectively, given the smaller number of state officials compared to the existing number of public officials.

Public functions could be further categorized, whereby the primary group would be authority of autonomous province, local self-government unit and city municipality, as well as the bodies of public enterprises and other companies, and the secondary group would be the bodies, institutions etc., all in accordance with the vulnerable areas foreseen in the National Strategy and assessments regarding the risk of corruption.

Both state and public officials would continue to have unchanged obligations regarding conflicts of interest, accumulation of functions and gifts. The criteria for simultaneous performance of functions, i.e. simultaneous performance of functions and performance of work, would remain unchanged, but prior consent of the APC would be necessary for public officials. What would significantly differ between state and public officials is that the first group would still have unchanged obligations to submit

the Report of Assets and Income (Report), while public officials would have the obligation to submit the Report at the request of the APC, in accordance with Article 70 of the LPC, in accordance with the criteria established by the Methodology.

Although there are no major objections to the normative and institutional framework for submitting and verifying the Report, this does not mean that they cannot be improved. In this sense, the key recommendations for more efficient and effective checks of the Report are the improvement of the normative framework and the improvement of the APC capacity.

The improvement of the organizational and personnel capacities of the APC would include the complete digitization of registers and procedures, which would eventually lead to the automation of the verification of the Report by connecting it qualitatively with other public registers. The "principle of one counter" would increase the reliability of data from the Register of Assets and Income of Public Officials, and at the same time facilitate and automate the obligation of public officials. Thus, the data on property and income previously reported by a public official to another competent authority (submitted tax return, registered real estate, etc.) would automatically be downloaded into the said register. In the described way, the limited personnel capacities of the APC, in which the primary verification and verification of the Report is performed by a dozen employees, would be overcome. In the final outcome, it would enable comprehensive checks of the Report in real time and monitoring the Financial Status (lifestyle) of public officials.

A special improvement is also necessary in the very definition of the mentioned criminal act in Article 101 LPC. Namely, it is not easy to prove the intention for the existence of the mentioned criminal act in court proceedings, and there is almost no way to objectively establish that the intention was the one that is criminally sanctioned. On the other hand, the current norm is too strict, because no distinction is made in essentially different and unequally important situations in which the official violated his obligation. For example. the law does not make a distinction whether information is omitted about some property that the official legally inherited and registered in the Real Estate Cadastre, or hidden property whose formal owner is a related party. In addition, the current norm does not include former officials who also have the duty to submit a report after the termination of public office, so there is no reason for them to be amnestied from criminal liability for this act.

Analysing the data published in the APC's Annual Work Reports[5] on criminal charges filed for criminal offenses under Article 72 of the Law on the Anti-Corruption Agency and Article 101 of the Law on Prevention of Corruption, it can be concluded that in the period from 2010 to 2022, the competent public prosecutor's office dismissed 34 criminal charges using the principle of opportunity.

The public prosecutor has the right to decide, based on the principle of opportunity, whether to require the suspect to fulfil one or more obligations. In order to defer criminal prosecution, the public prosecutor will determine the obligations which a suspect must fulfil, and a time limit during which the suspect must fulfil the obligations undertaken, with the provision that the time limit may not exceed one year. Terms of an agreement cannot be deferred. If the suspect fails to fulfil the obligation(s) undertaken, the public prosecutor will continue with the criminal prosecution in order to decide on the criminal complaint/allegation and whether to bring an indictment against the suspect.

However, the question arises of the adequacy of the application of the principle of opportunity, primarily because after the conclusion of the agreement, assets and income still remain unreported. For this reason, it is necessary to amend the criminal regulations, whereby the application of the principle of opportunity will necessarily include the submission of the Report, along with the performance of other obligations.

5 https://www.acas.rs/cyr/pages/godi%C5%A1nji_izve%C5%A1taj. Downloaded 29.06.2024.

Reiss had a negative opinion of parliamentarianism as a way of organizing government. One of the reasons was that, in his opinion, people's deputies did not pass laws in the interest of the state, but in the interest of the political parties they belonged to and in their own interest. In Reiss's time, nowhere in the world, not even in Serbia, was a mechanism developed to corruption proofing on legislation (CPL), which would have prevented the adoption of such laws. Today in Serbia, the situation is different - after the adoption of the LPC, state administration bodies have an explicit obligation to submit draft laws to the APC for the purpose of assessing the risk factor of corruption. The practice of the APC has shown that improvements are necessary in that process, which is why the APC submitted an initiative for amendments to the LPC. However, what is crucial in this segment is that the National Assembly represents the last barrier to prevent the domino effect and the spillover of corruption risk factors from laws into individual legal acts - decisions, judgments, etc. Therefore, for key improvements in this area, amendments to the law are not necessary, as amendments to the Rules of Procedure of the National Assembly are sufficient. With those changes, the parliamentary discussion, or at least the discussion of the departmental committee, would necessarily include a discussion of the risk factors of corruption in the draft law. Of course, as the founder of the Agency, the National Assembly could, according to its best understanding, always use all the Agency's capacities in this area. In this way, the mechanism of CPL would turn from a pillar into a foundation of corruption prevention.

And finally, but perhaps most importantly, prevention of corruption as a process will inevitably be more successful if it is focused on the target group that will biologically participate in the process for the longest time - the young. The best tool in that process is anti-corruption youth education. This is a critical component in the fight against corruption. It involves raising awareness about the negative impacts of corruption on society and promoting ethical values, integrity, transparency, and accountability. This type of education aims to empower individuals to resist and report corrupt practices, as well as to promote good governance and the rule of law. Anti-corruption education targeted at youth is particularly important as it helps instil ethical values and integrity from a young age. By educating young people about the negative impacts of corruption and empowering them to make ethical decisions, we can create a generation that is more resistant to engaging in or tolerating corrupt practices. This type of education must take place in schools through anti-corruption curricula, extracurricular activities promoting integrity and transparency, and workshops focusing on ethical leadership. Engaging youth in discussions about corruption, encouraging them to ask questions and think critically about the world around them, and providing them with the tools to challenge corruption can help shape them into responsible and ethical persons. When children and youth are building character and an understanding of societal norms at the primary and secondary education levels, it is critical to instil a well-rounded understanding of respect, ethics and integrity. The goal is very simple - to build a culture of integrity. The APC recognized the importance of anti-corruption education of young people and initiated some processes at the faculties. However, it must be the concern of the whole society - immediately and in the entire educational system.

CONCLUSION

The existence of corruption is closely related to the existence of the state. Every country in the world has experienced it to some extent. A brief analysis of Reiss's book indicates that a political system per se may be a generator of corruption, and this probably applies more or less to every political system in the world. Active listening to Reiss's warnings today seems to us more important than ever. Actively listening to Reiss does not mean political bickering and accusing the other side of corruption. Active listening to Reiss means daily proactive action and prevention of corruption and its suppression,

whenever necessary. Actively listening to Reiss means eliminating corruption and building a Serbian society based on a culture of integrity. Actively listen to Reiss, Serbs!

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II

CONTEMPORARY CHALLENGES IN DETECTING AND PROVING CRIME

THE APPLICABILITY OF THE RULES ON INTERNATIONAL CRIMES IN OUTER SPACE

Pablo Antonio Fernández Sánchez, PhD[1]
Visiting Professor at the University of Salerno, Italy
Full Professor of Public International Law at the University of Seville, Spain

INTRODUCTION

Human activities in outer space are relatively recent, which explains why international law has not historically been interested in regulating the general scope of the obligations of subjects of international law in this space.

Therefore, we can see that regulation has been gradual[2], depending on the activities carried out or the real possibilities of carrying them out[3]. For this reason, specific agreements of a conventional nature[4] have been established and legal principles have been established to govern the activities of States in the exploration and use of outer space[5].

With regard to international crimes, whether attributed to States or imputable to human beings, what interests us in this reflection is that, regardless of the legal status of outer space, there are jurisdictional frameworks for subjects of international law in this space, regardless of their legal qualification.

The rules that can generate state responsibility or individual criminal responsibility have their origin in both general international law and conventional international law.

I will pay special attention to the context of armed conflicts, where most of the rules of international criminal law are located. Therefore, despite the general prohibition of *ius ad bellum*, such as the principles of peaceful purposes of all space activities, the reality is that international illicit acts can occur in this area (the prohibition of the use of force, aggression, etc.) as well as the need to apply the rules of *ius in bello*, to sanction the violation of its rules, whether within the state or personal framework.

I will place special emphasis on the framework of individual criminal responsibility.

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1 pafernandez@us.es

2 For a Research Guides, see Thomas J, Meskill Law Library, "Research Guides – Outer Space Law", in https://libguides.law.uconn.edu/c.php?g=1047257&p=8099421.

3 For a general view, see Heck A. (ed.), "Organizations and Strategies" in *Astronomy*, 6, 2006: 191–204.

4 I only mention their titles, leaving their specific identification for later: Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies; Agreement on the Rescue and Return of Astronauts and the Return of Objects Launched into Outer Space; Convention on International Liability for Damage Caused by Space Objects; Convention on Registration of Objects Launched into Outer Space; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.

5 I only mention their titles, leaving their specific identification for later: Declaration of legal principles governing the activities of States in the exploration and use of outer space; Principles governing the use by States of artificial satellites of the Earth for international direct television broadcasting; Principles relating to remote sensing of the Earth from space; Principles relevant to the use of nuclear power sources in outer space; Declaration on international cooperation in the exploration and use of outer space for the benefit and in the interests of all States, taking into account especially the needs of developing countries.

This will lead me to use a systemic methodology where all the rules are integrated, wherever they come from, given that the applicable law must be holistic. Therefore, the set of rules of public international law, whether general, conventional, specific, particular, universal or regional, as well as rules from national legal systems, will have to be present.

Primary and secondary sources are difficult to understand because the subject matter is new and because of the lack of state practice. However, the justification for the existence of the rules, as well as the justification for the opinions, will have as many references as possible, within the framework of the direct and indirect rules, as well as in specialized and updated bibliography.

THE GENERAL SCOPE OF INTERNATIONAL LAW OBLIGATIONS IN OUTER SPACE

The Scope of Application Ratione Loci or Ratione Geographiae

The scope of application *ratione loci* refers to the territorial scope of the rules of international law. In principle, international law arises as a consequence of regulating legal relations between States, so, uniquely, it is an interstate law to regulate the common interests of States[6]. The key to the international order that was generated in Westphalia had to do with territorial aspects because three major principles were established: respect for territorial limits, territorial and not personal jurisdiction, and the sovereign equality of States.

These spatial concepts, born in 17th century Europe, would spread to the rest of the world when the geographical horizons were broadened without altering the system of territorial States. In this way, medieval European entities became territorial States with a national base, such as Russia, Austria or Turkey, and non-European societies accepted the hegemony of the prevailing political system. In this way, in the East, Western political practices displace ancient customs and cultures. This is what justifies why Japan, in the 19th century, took only 20 years to dismantle its traditional feudal system and assimilate the techniques of Western diplomacy, international negotiation and forms of territorial defense.

The evolution of the spatial scope of application of International Law towards common spaces without a State territorial base, such as seas and oceans, Antarctica, the airspace overlying these common spaces, non-autonomous territories, etc. and the obligatory framework of States beyond their own territories, in matters that affect global public goods, such as the environment, food security, communication networks, etc.[7]

At this point, we are interested in reflecting on the legal nature of outer space as a global public good and, if so, its dimension of non-appropriable, but affected by the general or particular regulations of international law.

All the rules of International Law are established to generate an obligatory framework in the territory of each State where jurisdiction is exercised, in the international sense, that is, where the State exercises territorial, material, personal and temporal competences. The territory of the State is, therefore, the physical framework where the rules of International Law are executed. The responsibility for their

6 In relationship with outer space, see Craven, M., "Other Spaces": "*Constructing the Legal Architecture of a Cold War Commons and the Scientific-Technical Imaginary of Outer Space*", in *European Journal of International Law*, Volume 30, Issue 2, May 2019: 547–572, https://doi.org/10.1093/ejil/chz024

7 Pic, P., Evoy, Ph. & Morin, J.F., "Outer Space as a Global Commons: An Empirical Study of Space Arrangements" in *International Journal of the Commons* 17(1), September 2023: 288-301, DOI:10.5334/ijc.1271

application is, therefore, the responsibility of the State (regardless of whether their non-application corresponds to another subject of international law or to the nationals of a State in question).

Regardless of the lack of definition of the territorial limits, well defined by the recognized borders, by the obligations imposed by international treaties or by the application of general rules of international law, it is peaceful to consider that the territorial State competences end at the point where the Earth's atmosphere disappears, with the States having competences in the space overlying their territory, in the atmospheric space until outer space begins.

The Outer Space Treaty[8] does not establish a specific limit, so very diverse opinions and criteria coexist. NASA considers that the limit begins at 80 km above sea level, or the International Aeronautical Federation, which places the beginning of outer space at the Kármán line (100 km)[9]. Other scientific measurements establish the limit at 118 km and even below 80 km.[10]

However, regardless of the exact measurement, the reality is that in outer space, States, as primary subjects of the international order, no longer have territorial competence to apply their own norms and international law.

In this way, there is no scope of application *ratione loci* within the framework of outer space, beyond the fiction of space objects as spaces of the "flag" States, as already exists within the framework of the Law of the Sea.

There is a part of the doctrine that qualifies this *ratione loci* referring to outer space as *ratione geographiae*[11]. However, this denomination, which could be useful when we speak of outer space in general, as a stellar mass, is not useful when we speak of space objects where most of the current legal controversies arise. For this reason, I will continue to use the Latin denomination of this competence as *ratione loci*. This will be relevant in the analysis of the commission of international crimes, whether attributed to States or imputed to individuals, whether within the framework of the *ius ad bellum* or in the framework of the *ius in bello*.

There has been little practice in elucidating the existence of legal principles or rules, general or conventional, to determine the jurisdiction of a State over crimes committed in outer space. There is a relatively recent case that was brought to light by the New York Times. It was the case of astronaut Anne McClain, who while physically on the International Space Station, between December 2018 and June 2019, allegedly committed a federal crime, classified in the US criminal code, by accessing her ex-partner's bank account, without his consent, for which she is accused of identity theft and irregular access to financial records[12].

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies[13], expressly states in its article 8:

8 Signed by 133 States.

9 Hungarian physicist Theodore Von Kármán who determined it at the beginning of the 20th century. See Gorn, M. H., *The Universal Man: Theodore von Kármán's Life in Aeronautics*, Smithsonian Institution Press, Washington, 1992.

10 https://www.larazon.es/tecnologia/20220506/6bnjo4wq45hvbl7uhbs4docbw4.html#:~:text=Otro%20criterio%20distinto%20es%20el,a%20comienzos%20del%20siglo%20XX.

11 Dunk, F. G. von der, *International Space Law*, University of Nebraska-Lincoln, US. 2018: 29, 62–63 (and literature cited there).

12 See the facts and comments by Biker, M., at https://www.nytimes.com/es/2019/08/27/espanol/mundo/nasa-espacio-delito.html, August 27, 2019.

13 General Assembly Resolution 2222 (XXI), annex, adopted 19 December 1966, opened for signature 27 January 1967, entered into force 10 October 1967.

> "An object launched into outer space shall retain jurisdiction and control over such object, as well as over all personnel on such object, while in outer space or on a celestial body"

In the specific context of the International Space Station, where the events reported against astronaut Anne McClain occurred, there is an "Agreement between the Government of Canada, the Governments of the Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation and the Government of the United States of America on cooperation on the International Civil Space Station of 1998"[14], whose article 22 on criminal jurisdiction expressly states that:

> "Taking into account the unique and unprecedented nature of this specific form of international cooperation in space.
>
> 1. Canada, the European associated States, Japan, Russia and the United States may exercise criminal jurisdiction over personnel within or on any flight element that is a national of the respective country."

The legal nature of this Agreement is that of any international treaty (an agreement of wills, subject to International Law, made between subjects of International Law), so McClain is removed from the American criminal jurisdiction, due to the nationality of the astronaut (competence *ratione personae*, as we will see later)[15].

This means that, for the moment, the norm and practice are directed towards considering that the types and penalties usual in criminal law are also applicable in outer space. This fiction, coming from the Law of the Sea, is beginning to take root in International Law and we will soon have the opportunity to study more practice in this regard[16].

Beyond crimes of a "national" dimension, the spatial jurisdictional framework to which international crimes are subject is governed by the rules of International Law, as we will see later, and is therefore subject to international treaties and international obligations.

The Scope of Application Ratione Materiae

It would be a different matter to establish a scope of application based on the specific subject matter involved, for example, the framework of liability, objective or subjective, for space activities carried out by States or other subjects subject to the powers conferred by States within the framework of international organisations or to the specific jurisdiction of a State.

It is clear that the rules relating to outer space are specifically designed to be applied by States within the framework of activities carried out in space. In this sense, the rules contemplated in the treaties already mentioned such as the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies[17]; the Agreement on the

14 In English: https://www.state.gov/wp-content/uploads/2019/02/12927-Multilateral-Space-Space-Station-1.29.1998.pdf; In Spanish: https://www.boe.es/boe/dias/1999/01/06/pdfs/A00375-00386.pdf

15 For a general view of the relationship between International Space Law and US law, see Mirmina, S., & Schenewerk, C. International Space Law and Space Laws of the United States. Cheltenham, UK: Edward Elgar Publishing, 2022. Retrieved Sep 15, 2024, from https://doi.org/10.4337/9781788117890

16 Moro, R., "El Derecho Penal Espacial", in *Cuadernos de Criminología*, nº 21, 2013: 30-39 (https://revistaqdc.es/el-derecho-penal-espacial/).

17 General Assembly Resolution 2222 (XXI), annex, adopted 19 December 1966, opened for signature 27 January 1967, entered into force 10 October 1967.

Rescue and Return of Astronauts and the Return of Objects Launched into Outer Space[18]; the Convention on International Liability for Damage Caused by Space Objects[19]; the Convention on Registration of Objects Launched into Outer Space[20]; and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies[21], as well as norms recognized as legal principles by the organized international community, such as the legal principles governing the activities of States in the exploration and use of outer space[22]; the principles governing the use by States of artificial Earth satellites for international direct television broadcasting[23]; the principles relating to remote sensing of the Earth from space[24]; the principles relevant to the use of nuclear power sources in outer space[25]; the principles concerning international cooperation in the exploration and use of outer space for the benefit and in the interests of all States, taking into account especially the needs of developing countries[26].

This is without forgetting the application of certain aspects relating to the use of the geostationary orbit (General Assembly Resolution 55/122 of 8 December 2000), the concept of the "launching State" (General Assembly Resolution 59/115 of 10 December 2004), or the Recommendations for improving the practice of States and international intergovernmental organisations in registering space objects (Resolution 62/101 of 17 December 2007).

However, competence *ratione materiae* goes far beyond space rules. In principle, any rule of international law can extend its scope to be applied in outer space, which does not mean that this principle applies to rules of an internal nature. When an activity resulting from the exploration or use of outer space gives rise to state or individual responsibilities, States are competent *ratione materiae* to apply its legal effects, when the consequences may give rise to responsibilities. It is true that, in the case of state responsibility, the instrument to settle the dispute will have to be determined, and in the case of individual responsibility, the best applicable jurisdiction.

However, this does not mean that it can be extrapolated, *ratione materiae*, that all internal rules can be replicated in outer space because other jurisdictional aspects would have to be determined or the singularities of each specific case would have to be seen.

In fact, the Permanent Court of Arbitration, on December 6, 2011, aware of the complexity of this situation in outer space, adopted the Optional Rules for Arbitration of Disputes Relating to Outer Space Activities[27], based on the 2010 UNCITRAL RULES[28].

We are not dealing with any international treaty or mandatory rules. It is simply a matter of offering solutions to the numerous legal conflicts that may arise in outer space. Therefore, they are only mechanisms for interested parties (generally private entities) to resolve their legal disputes, including a list of experts.

18 General Assembly Resolution 2345 (XXII), annex, adopted 19 December 1967, opened for signature 22 April 1968, entered into force 3 December 1968.

19 General Assembly Resolution 2777 (XXVI), annex, adopted 29 November 1971, opened for signature 29 March 1972, entered into force 11 September 1972.

20 General Assembly Resolution 3235, annex, approved 12 November 1974, opened for signature 14 January 1975, entered into force 15 September 1976.

21 General Assembly resolution 34/68, annex, approved on 5 December 1979, opened for signature on 18 December 1979, entered into force on 11 July 1984.

22 General Assembly Resolution 1962 (XVII) of 13 December 1963.

23 General Assembly Resolution 37/92 of 10 December 1982.

24 General Assembly Resolution 41/65 of 3 December 1986.

25 General Assembly Resolution 47/68 of 14 December 1992.

26 General Assembly Resolution 51/122 of 13 December 1996.

27 https://docs.pca-cpa.org/2016/01/Permanent-Court-of-Arbitration-Optional-Rules-for-Arbitration-of-Disputes-Relating-to-Outer-Space-Activities.pdf

28 https://docs.pca-cpa.org/2016/01/UNCITRAL-2010-English.pdf

Within the framework of application *ratione materiae*, these rules can resolve:

- space treaty arbitration, amongst States;
- investment arbitration, among States and private entities (i.e. investors);
- commercial arbitration, among private entities and States acting *jure privatorum*[29].

In this regard, Resolution 68/74 of the United Nations General Assembly, of December 11, 2013, recommends referring to the state regulations of the States responsible for the launch and/or activities carried out in outer space, the following:

> "The State, taking into account its obligations as a launching State and as a State responsible for national activities in outer space under the United Nations treaties on outer space, should ascertain national jurisdiction over space activities carried out from territory under its jurisdiction and/or control; Likewise, it should issue authorizations for and ensure supervision over space activities carried out elsewhere by its citizens and/or legal persons established, registered or seated in territory under its jurisdiction and/or control, provided, however, that if another State is exercising jurisdiction with respect to such activities, the State should consider for-bearing from duplicative requirements and avoid unnecessary burdens"[30].

As Von der Dunk reminds us,

> "a number of States has (at least so far) limited the scope of their national space law *ratione materiae* to specific space sectors.
>
> Most importantly, in five cases States have national legislation in place essentially advising private involvement in launch activities only. This concerns following Norway in 1969 as referenced above, in 1998 Australia, in 2001 Brazil, in 2005 South Korea, and in 2017 New Zealand. In two cases—as of 2005 Canada and as of 2007 Germany—national law on private sector space activities so far only addresses private involvement in satellite remote sensing activities. In one case - as of 2017 Luxembourg - current national law exclusively focuses on prospective interests by private parties in space resource exploitation"[31].

All this means that state and international practice is directed towards the application of the Law in outer space in accordance with the competence *ratione materiae*, which will derive jurisdiction, either to the international sphere, or through an agreement judicial, arbitral or other means of peaceful dispute resolution, either at the national level, when there is a connection *ratione personae* present.

The Scope of Application Ratione Personae

In principle, all States have the freedom to explore and use outer space, and each has, in turn, the inherent responsibility for the legal consequences. Obviously, the limitations for all this are imposed by the specific applicable law. This allows us to speak in international treaties, as we have already seen, of possible exploration and use activities. For example, article VI of the Treaty on Principles Governing

29 Vincenzo, C., "Resolving disputes in outer space: the role of international arbitration", *DLA PIPER*, 6 April 2023 (https://www.dlapiper.com/en/insights/publications/2023/04/resolving-disputes-in-outer-space-the-role-of-international-arbitration).

30 UNGA Resolution on "Recommendations on national legislation relevant to the peaceful exploration and use of outer space," UNGA Res. 68/74 of 11 December 2013. See also the Report of the Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, UN Doc. A/AC.105/C.2/101, 3 April 2012. Emphasis added.

31 Dunk, F. G. von der, "Scoping National Space Law: The True Meaning of "National Activities in Outer Space" of Article VI of the Outer Space Treaty", in *Space, Cyber, and Telecommunications Law Program Faculty Publications*, University of Nebraska – Lincoln, 2020, (https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1116&context=spacelaw)

the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (hereafter Outer Space Treaty), London/Moscow/Washington, done 27 January 1967[32].

It also seems that nothing prevents a national, company or individual from exploring space[33]. The exploitation of resources would be different because it could come into conflict with general or conventional norms. Indeed, the US Commercial Space Launch Competitiveness Act of 25 November 2015 (known as the Space Act)[34] or the US Executive Order on Encouraging International Support for the Recovery and Use of Space Resources of 6 April 2020[35], which states that "Americans should have the right to engage in commercial exploration, recovery and use of resources in outer space, pursuant to the Space Act' and that 'outer space is a legally and physically unique domain of human activity, and the United States does not view it as a global commons", are good examples of these issues[36].

Luxembourg has also adopted the Law of 20 July 2017 on the exploration and use of space resources[37], by which any company that registers can make use of the exploitation of space resources, opening a Pandora's box that is difficult to reject in view of the enormous strategic and economic interests in the exploitation of space assets. This opens the scope of application *ratione personae*, which goes far beyond the States themselves, including legal entities and natural persons.

This raises a very important question. Can and should States exercise jurisdiction over the activities carried out by their companies registered and domiciled in their state territory and by individuals considered individually, nationals or residents in their territory?

The answer is obvious, although this evidence will be substantiated throughout the following chapters.

Obviously, we must distinguish, as I will do later, between state companies, companies with a high level of participation by the State and those that receive subsidies or are covered by some type of state aid or distinction (for example, companies that are subject to the privilege of the MARCA ESPAÑA).

As for people, obviously, we must also distinguish between public officials, civilians or military personnel and individuals. Everything will depend on the objective or subjective consequences of the actions that can be attributed or imputed to a State or an individual.

In any case, it will always be the State that has the obligation to pursue the crime and to prosecute it, if appropriate. I will deal with this in the following chapters.

The Scope of Application Ratione Temporis

The jurisdiction *ratione temporis* determines the effectiveness of the provisions of international law over time, that is, determining the temporal effects of the application of the rules[38]. Difficulties often

32 See the analysis of Dunk, F. G. von der, "Scoping National Space Law…" *op. cit.*

33 See Vermeylen, S., "Global legal pluralism and outer space law: The Association of Autonomous Astronauts as a socio-legal community", in Cockell, Ch. S. (ed.), *The Institutions of Extraterrestrial Liberty* , Oxford University Press, 2022; online edn, Oxford Academic, 19 Jan. 2023), https://doi.org/10.1093/oso/9780192897985.003.0026, accessed 15 Sept. 2024.

34 https://www.congress.gov/114/plaws/publ90/PLAW-114publ90.pdf

35 https://trumpwhitehouse.archives.gov/presidential-actions/executive-order-encouraging-international-support-recovery-use-space-resources/

36 For the defense of the outer space as a global common, see Bittencourt Neto, O. de "Chapter 1: Outer space as a global commons and the role of space law", in *A Research Agenda for Space Policy*. Cheltenham, UK: Edward Elgar Publishing, 2021. Retrieved Sep 15, 2024, from https://doi.org/10.4337/9781800374744.00009

37 https://legilux.public.lu/eli/etat/leg/loi/2017/07/20/a674/jo

38 Armand, T., "Jurisdiction Ratione Temporis", 10 September 2024, inhttps://jusmundi.com/en/document/publication/en-jurisdiction-ratione-temporis.

arise within the framework of general international law, due to the very imprecision of the moment in which it produces its initial effects and, even, in the cessation of its effects. However, within the conventional framework, there are general rules that, in the absence of establishing the validity of a treaty, the general rules apply[39].

In this sense, the temporal duration of treaties is usually determined in their own provisions, which indicate the clause of their entry into force and, eventually, their temporary termination. Therefore, it is the States Parties that determine the conditions and the date of their entry into force. For example, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, of 19 December 1966, entered into force on 10 October 1967, since Article XIV-3 states that "This Treaty shall enter into force upon the deposit of instruments of ratification by five Governments, including those designated as Depositary Governments under this Treaty." Thus, it clearly establishes, like almost all treaties, the conditions and the exact date of its entry into force.

In accordance with Article XVI, the particular termination date is also indicated for when a State wishes to withdraw from it: "Any State Party may communicate its withdrawal from this Treaty one year after its entry into force by written notification to the Depositary Governments. Such withdrawal shall take effect one year after the date of receipt of such notification."

When the entry into force of an international treaty is not specifically specified, Article 24 of the Vienna Convention on the Law of Treaties of 23 May 1969[40] shall apply:

> "Entry into force. 1. A treaty enters into force in such manner and upon such date as it may provide or as the negotiating States may agree.
>
> 2. Failing any such provision or agreement, a treaty enters into force as soon as consent to be bound by the treaty has been established for all the negotiating States.
>
> 3. When the consent of a State to be bound by a treaty is established on a date after the treaty has come into force, the treaty enters into force for that State on that date, unless the treaty otherwise provides".

In addition to these applicable rules, there are generally recognized principles in international law such as the non-retroactivity of treaties, which means that its rules cannot be enforced before their entry into force for the parties. In fact, Article 4 of the Vienna Convention on the Law of Treaties states the following:

> "4. Without prejudice to the application of any rules set forth in the present Convention to which treaties would be subject under international law independently of the Convention, the Convention applies only to treaties which are concluded by States after the entry into force of the present Convention with regard to such States".

In turn, Article 28 of the aforementioned Vienna Convention on the Law of Treaties also indicates the scope of application *ratione temporis* of treaties. In this sense, it expressly states:

> "Non-retroactivity of treaties. Unless a different intention appears from the treaty or is otherwise established, its provisions do not bind a party in relation to any act or fact which took place

39 International arbitration law has produced an interesting purview in this regard. See Rubins, N. & Love, B., "The Scope of Application of International Investments Agreements: Ratione Temporis", in Bungenberg, M., Griebel, J., Hobe, S. & Reinisch, A. (eds.), *International Investment Law: A Handbook*, Nomos, 2015: 481-494.

40 https://legal.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf

or any situation which ceased to exist before the date of the entry into force of the treaty with respect to that party."

This intention could well be the existence of an agreement of provisional application, that is, the "Partial or total implementation of an international treaty before its entry into force, by provision of the treaty itself or by the will of its negotiators, which ends generally with the entry into force of the treaty and in particular by notification by a State or an international organization of its intention not to become a party to it".[41]

Another possible variable would be the application of a treaty before its entry into force when, exceptionally, a continuing or multi-offensive crime occurs, such as, for example, the disappearance of persons or other crimes under international law[42]. The jurisprudence of international courts has been constant and peaceful[43].

In general, conventional practice is not to indicate a specific period of termination of the effects, although there are also examples of this, such as, for example, the Treaty on the European Coal and Steel Community, whose article 97 indicated that the treaty was concluded for a duration of 50 years, so that on July 23, 2002 it ceased to apply[44] or the Kyoto Protocol that would end in January 2013, although its validity was extended by the so-called DOHA Amendment until December 2020, although obviously some States decided not to extend said validity[45].

A specific problem of outer space, within the framework of the *ratione temporis* competence, would be that of the measurement of time itself. If we accept that the concept of time is the rotation of the earth on its axis, in outer space, time does not exist, as we interpret it on earth, which, at most, is organized in different time zones.

Outside our planetary environment, significant differences could occur. This was already described by Einstein in 1907 when he spoke of the gravitational dilation of time as a consequence of the General Theory of Relativity[46]. This could mean that the commission of a crime could result in different consequences depending on whether it is measured at the place of its commission or within the framework of terrestrial accounting.

This could mean a problem when determining international liability that should be resolved by the courts, when determining their own jurisdiction.

I am inclined to think that when these circumstances occur, terrestrial courts will advocate for the time zones of their location, but we will have to be aware of the variability of the circumstances, when we can find reliable practices.

41 Pan-Hispanic Dictionary of Legal Spanish (https://dpej.rae.es/lema/aplicación-provisional).

42 Judgment of the IACHR, July 29, 1988, (Velásquez Rodríguez Case), Series C No. 4, para. 155-157. See also, Judgment of the IACHR, January 20, 1989, (Godinez Cruz Case), Series C No. 5, para. 163 and Judgment of the IACHR, January 24, 1998, (Blake Case), Series C No. 36, para. 65.

43 Arteaga Padilla, E. & Guzmán González, P., "La desaparición forzada: Excepción a la competencia Ratione Temporis en el Derecho Internacional de los Derechos Humanos", *Revista Justicia*, No. 17 - pp. 23-31 - Universidad Simón Bolívar - Barranquilla, Colombia, junio 2010: 28.

44 https://europa.eu/ecsc/publications/actes.pdf

45 https://unfccc.int/files/kyoto_protocol/application/pdf/kp_doha_amendment_english.pdf

46 A rigorous dissemination of this theory can be seen in Blanco Laserna, D., *The Theory of Relativity, EISNTEIN (Space is a question of time), National Geographic*, Rodesa, Villatuerta, Navarra (Spain), 2015 (https://grupocc-lab.com.mx/wp-content/uploads/2023/04/01-Einstein.pdf).

SPECIFIC LEGAL PRINCIPLES OF INTERNATIONAL CRIMINAL LAW APPLICABLE IN OUTER SPACE

Principle of Extraterritoriality

First of all, I would like to point out the difficulties of extraterritorial application in general and of International Criminal Law in particular. Even more so when there are punishable actions by States, their officials or representatives (astronauts are), companies and individuals, since it generates too many variables to take each one into account.

The concept of territorial jurisdiction is relatively modern. It emerged in the world of International Law with the Peace of Westphalia[47]. Until then, the basis of jurisdiction was personal[48]. In fact, this type of jurisdiction was raised again in relation to space and cyberspace activities[49].

In this perspective, when territorial jurisdiction comes into play, it is when extraterritoriality is raised, that is, the capacity of the State to exercise legal control over people or facts beyond its own territory[50].

This legal technique of extraterritoriality[51] breaks with the principle of territoriality[52], a principle that, as the ICJ recognized, is not an absolute principle[53].

Various techniques or doctrines have been used to explain extraterritorial jurisdiction. Theories such as "effective control"[54] or "personal control"[55] or "authority and control"[56] have emerged. Now, all these theories, perfectly valid, relate to acts of the State, of agents or officials or persons who exercise State powers. Of course, it could extend to State companies and even to private companies with a high level of State participation and it could equally extend to those that are given financial or diplomatic support or with the endorsement of the State (for example, as I have already said, the *Marca España*, which can offer investment guarantees, State insurance, export credits, etc.).

Even in these clear cases of State intervention, within the framework of the jurisdiction of international courts, there have been legal controversies in the application of these various doctrines or unequal

47 Patton, St., "The Peace of Westphalia and it Effects on International Relations, Diplomacy and Foreign Policy," in *The Histories*, Vol. 10: Iss. 1, Article 5, 2019. Available at: https://digitalcommons.lasalle.edu/the_histories/vol10/iss1/5

48 Scott, D., "Personal Jurisdiction in Comparative Context", *The American Journal of Comparative Law*, Volume 68, Issue 4, December 2020, Pages 701–721, https://doi.org/10.1093/ajcl/avaa020

49 Zekos, G. I., "State Cyberspace Jurisdiction and Personal Cyberspace Jurisdiction", *International Journal of Law and Information Technology*, Volume 15, Issue 1, Spring 2007: 1–37.

50 Menno, K., "Extraterritoriality", in *The Max Planck Encyclopedia of Public International Law*, Oxford University Press, 2020. (https://cris.maastrichtuniversity.nl/ws/portalfiles/portal/93221900/Kamminga_2020_Extraterritorality.pdf).

51 Palombo, D., "Extraterritorial, Universal, or Transnational Human Rights Law?", in *Israel Law Review*, vol 56(1), 2023: 92-119 (DOI: 10.1017/S0021223722000139.

52 Sender and Wood have analyzed the extraterritoriality from point of view of the customary law. See Sender, O., & Wood, M., "Chapter 2: Extraterritorial jurisdiction and the limits of customary international law", in *Research Handbook on Extraterritoriality in International Law*. Cheltenham, UK: Edward Elgar Publishing. Retrieved Sep 15, 2024, from https://doi.org/10.4337/9781800885592.00009.

53 *The case of the SS. Lotus (France/Turkey)*, PCIJ Series A, No. 10 (1927), 20.

54 Montejo, B., "32. The Notion of 'Effective Control' under the Articles on the Responsibility of International Organizations", in Ragazzi, Maurizio (Ed.), *Responsibility of International Organizations. Essays in Memory of Sir Ian Brownlie*, Brill Nijhoff, 2013: 387-404.

55 Çali, B., "Has 'Control over rights doctrine' for extra-territorial jurisdiction come of age? Karlsruhe, too, has spoken, now it's Strasbourg's turn", in *EJIL: Talk!*, July 21, 2020. Available at: (https://www.ejiltalk.org/has-control-over-rights-doctrine-for-extra-territorial-jurisdiction-come-of-age-karlsruhe-too-has-spoken-now-its-strasbourgs-turn/).

56 Wrange P., "Does Who Matter? Legal Authority and the Use of Military Violence", in *Ethics & International Affairs*, 2017;31(2): 191-212. (doi:10.1017/S0892679417000077).

approaches. Territoriality is not the majority doctrine, even in international human rights courts, from whose analysis we can learn for International Criminal Law. Within the framework of the ECHR, the ECHR has pointed out that

> "Acts of the Contracting Parties that have been exercised outside their territory, or that have produced effects there, may entail the consideration of an exercise of their jurisdiction in terms of Art. 1"[57].

The jurisprudence of the ECHR has been variable. From the initial obligations of States beyond their territory, by the application of the doctrine of authority and control to the Bankovic doctrine where the ECHR pointed out that "the Convention was not designed to be applied by everyone, even with respect to the acts of the Contracting Parties". Therefore, the ECHR declared the claim inadmissible due to the lack of jurisdictional links between victims and respondent States[58]. It defended, therefore, a doctrine that we could call of "legal space", rather than territorial.

In the inter-American system, the theory of "authority and control"[59] is generally affirmed. In this sense, the Spanish National Plan regarding public sector companies points out the obligation to respect human rights, "both within and outside the territory" (Guiding Principle 4-3).

However, in these cases we are always talking about state acts, in one way or another. We are talking about the responsibility of the State, which as we know in the international criminal field is very limited.

Another thing would be the same responsibility, but for acts of non-state agents, such as companies that may be operating in state activities, and which goes beyond mere individual criminal responsibility. Therefore, the difficulty of the legal approach is that here we are talking about non-state entities.

Could a company or an individual person invoke the violation of a rule of International Criminal Law (or of internal criminal rules, based on jurisdiction or the principle of extraterritoriality) that has been violated by a transnational company, against the State where the company is based or has been established? We could certainly resort to the doctrine of "lack of due diligence" (which appears for the first time in the framework of the Inter-American Court of Human Rights)[60].

The theory of "effective control" or the principle of "cause and effect", or even of "authority and control" is not applicable, today, in the case of companies. This is the sign of international jurisprudence, including that of the Human Rights Committee[61].

The framework of the Law of the Sea would be a good example to transfer some of its principles, in this sense that is analyzed here, to the spatial framework. For example, we also have rules that regulate the rights and obligations of Flag States (which regulate the responsibilities of ships) while the jurisdiction of the Port or Coastal State regulates issues related to the safety of maritime traffic or issues of an environmental nature[62].

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57 *Issa v Turquía*, App.31821/96, Judgment ECHR, 16 November 2004. Para.68 y 71.

58 *Bankovic y otros c Bélgica*, App no.52207/99, Judgment ECHR, 12 December 2001, para. 80-82.

59 *Coard v United States*. IACHR. Case Nº10.951, 29 September 1999.

60 *Velásquez Rodríguez c Honduras*. Judgment IACHR, 29 July 1988, para.172

61 HRC, General Comment No.31 *Nature of the General Legal Obligation Imposed on States Parties to the Covenant* (26 June 2004) U.N.Doc. CCPR/C/21/Rev.1/Add.13

62 As an example, see Directive 2009/21/EC of the European Parliament and of the Council of 23 April 2009 on compliance with flag State requirements (OJEU L-31/32, 28 May 2009). Its transposition in Spain was done through the *Real Decreto 799/2011, de 10 de junio, por el que se establecen las obligaciones que incumben al Ministerio de Fomento en materia de seguridad marítima y prevención de la contaminación marina sobre buques españoles* (BOE nº 139, de 11 de junio de 2011).

We could therefore use this legal figure of the Flag State, shifting the same burden to transnational companies and requiring them to comply with the relevant regulations to justify concurrent or subsidiary jurisdiction with that of the territorial sovereign.

In the space field, we could use the aforementioned Spanish National Action Plan on Business and Human Rights, dated September 1, 2017, as a reference, in accordance with the Guiding Principles on Business and Human Rights of June 16, 2011 (A/HRC/17/31) and the 2030 Agenda for Sustainable Development (Resolution 70/1 of the United Nations General Assembly, dated September 25, 2015) and the Spanish Strategy for Corporate Social Responsibility, dated October 24, 2014, as sufficient grounds to invoke the enforceability of human rights by companies and the obligation of the State in this matter, including those engaged in space activities. At the very least, there is an express and implicit recognition of jurisdiction, in the international sense, which could even be considered, at the very least, as a unilateral act of the State, invocable at the international level.

Principle of Territorial Extension of the Norm or "Contingent Unilateralism"

This doctrine of "contingent unilateralism" means that a territorial extension of the application of the norms occurs when the protected legal right cannot be guaranteed by the territorial sovereign[63].

Here the theory of "territorial extension" or the "doctrine of effects" comes into play. To do so, of course, it is necessary that the internal regulations determine the nature of the violation of the norm and its location. International Law would have customary[64] and even conventional norms, such as territoriality, nationality, protection, universality, which would allow finding legal support.

For example, Guiding Principle 2 of the Spanish National Plan on Business and Human Rights requires Spanish companies based abroad to exercise "due diligence" in the area of human rights, recognising the State's obligation to protect human rights, including from abuses that may result from business activity.

Likewise, in environmental matters, the CJEU, in its 2011 ruling on the Aviation Directive, found links of recognition for this doctrine. The element, therefore, was not the extraterritorial application of the norm, which would then regulate norms beyond its borders, but rather that the link would be established by take-off or landing at a national airport, that is, a "territorial connection". The State, in this case, is obliged to take into account the consequences, even if the geographical space where these circumstances are located is not that of its sovereignty.

"Territorial extension" is an EU practice to give a global scope to European regulations, which could well be used in the practice of outer space. It is radically different from "extraterritoriality" because it is not a direct instrument for achieving legal effects of European regulations outside the territory of the Union. The aim of this theory devised or put into practice, as I say, by the CJEU, is to achieve a universal effect for the defense of general interests. We must not forget that human rights belong to the category of general interests and, consequently, their serious violation, wherever it may be, must be grounds for prosecution and sanction, where appropriate.

In principle, this extended right could not be applied to conduct produced in third States or against citizens of third States because it would violate sovereign equality, territorial integrity and the princi-

63 Scott, J., & Rajamani, L., "EU Climate Change Unilateralism", in *European Journal of International Law*, Volume 23, Issue 2, May 2012: 469–494, https://doi.org/10.1093/ejil/chs020

64 See Scharf M.P., "Outer Space Law", in *Customary International Law in Times of Fundamental Change: Recognizing Grotian Moments*. Cambridge University Press, 2013:123-138.

ple of non-intervention that each and every State has. If for pure and simple extraterritorial application, the cooperation of third States is required, in the case of "territorial extension", it is not required because the application is directed to the institutions, member states and citizens dependent on the jurisdiction of the EU or its States. In the case of outer space, there are also rules aimed at institutions, States and individuals operating in outer space.

When the EU regulates the verification of carbon emissions from maritime or air transport, for example, verifiable data on the said emissions must be incorporated, for the purposes of applying emissions trading, regardless of where the ship or aircraft is located, as long as it has a connection point with the EU territory, that is, the said ship or aircraft touches a European port or airport, on the way there or on the way back or in both directions. As regards international criminal law, in its application in outer space, in accordance with the areas of application already analyzed, similarities or analogies can be found for the approach to the application of this theory of "territorial extension".

The CJEU has ruled on several occasions in favor of the territorial extension of European standards, in very specific circumstances, which can serve as an example and reference for us, in the context of the application of International Criminal Law, in outer space. For example, in the *ICI v. European Commission* case[65], as early as 1972, the question arose as to whether a subsidiary of a European company, whose decisions are taken within the company based in the EU, should be subject to European standards.

In the *Air Transportation of America* case, it considers that the application of European standards outside its territory, in this case, has a legitimate purpose[66].

Could this idea be applied to human rights and the framework of International Criminal Law? From the perspective of international judicial bodies (ECHR or IACHR), what is being applied is only the concept of extraterritoriality, among other things because it requires the cooperation of third States, as we have seen, or because there is a direct relationship with the "effective control" of the State in question. However, in relation to the application of International Criminal Law there should be no objection, since cooperation would not be required and the sovereignty of third States would be safeguarded.

Principle of Universal Jurisdiction

Universal jurisdiction is a legal institution that has entered fully into all areas of social life in recent times. Public debates on it have not been limited only to the field of law or the academic field, but have transcended journalism, NGOs and national and international institutions. This indicates the high degree of interest in it.

However, for internationalists it was not, as a legal institution, so new[67]. It had already been invoked with some regularity, especially in the context of war crimes and other international crimes and it appeared in multiple international treaties, formulated directly, through the obligation *aut dedere aut judicare* or allowing any possible jurisdiction[68].

65 Judgment of the Court of Justice of July 14, 1972. Imperial Chemical Industries Ltd. v Commission of the European Communities. Case 48-69.

66 "Examination of Directive 2008/101 has disclosed no factor of such a kind as to affect its validity.". Decision, paragraph. 2, Case C-366/10.

67 Hovell, D., "The Authority of Universal Jurisdiction", in *European Journal of International Law*, Volume 29, Issue 2, May 2018: 427–456, https://doi.org/10.1093/ejil/chy037.

68 Fernández Sánchez, P. A., "Universal Jurisdiction and Terrorism", in *Groningen Journal of International Law*, vol 6(1) 2018: 24-48. ISSN: 2352-2674.

However, despite the extensive bibliography, the legal nature of the institution had not been directly addressed and much less in relation to its possible application in outer space. All academics have obviously used conventional practice and norms, but in a confused way and without paying attention to the analysis of their nature, without specifying the core of their foundation. Therefore, we must approach the study of this institution from this perspective and taking into account its application in outer space, which is the object of our concern.

It is true that this legal institution is closely related to war crimes, which has been its natural field for a long time[69].

I do not intend to go into the conceptual levels of competence and jurisdiction, among other things because there is a wide legal literature on both. But I will take into account the particularities of these concepts in International Law, because as Professor Sánchez Legido states in his magnificent work on universal jurisdiction, these notions are polysemic, therefore, as he himself says "it is convenient to specify that, in the context of the so-called universal jurisdiction, the notion of jurisdiction refers to a core of problems related to the projection of state powers in space"[70].

Furthermore, the emergence of internal law in this legal institution has led to talk of universal criminal and civil jurisdiction, as a corollary of said emergence, taking into account that for International Law this dichotomy was not necessary. In International Law, reparation or satisfaction was always spoken of. Now we are talking about criminal sanctions or civil compensation, as if it were internal law. Does this mean a permeabilization of one over the other? Of which over which? Will this permeability be exercised in the practice of space activities?

Like any other international legal norm, the competence attributed to the State for the exercise of universal jurisdiction can have a plurality of origins, and can even have a multiple nature. Perhaps we find Jean-Michael Simon's statement exaggerated when he states that

"possibly one of the first general references to the competence to extend the exercise of sovereign power beyond its territorial limits over unlawful acts is found in the study of the Dutch jurist Hugo Grotius (1583-1645), who, faced with the predominance of the *ius naturale* in the Middle Ages, formulated in 1625 that "It must also be recognized that kings, and any other with rights similar to these, can demand that a punishment be imposed not only for the evils perpetrated against them or against their affairs, but also against all evils that are not specifically directed against them, but that violate in an extreme way any person, natural law or the law of nations"[71].

It is not that Groccio was thinking at that time about what we now call "universal jurisdiction", because in fact, at that time, the conception was that the sovereign was immune and unassailable because *par in parem non habet imperium* (among equals, none has more power). However, I do believe that he also had in mind that a *ius gentium* could not be constructed without considering a criminal law that would allow its violations to be punished within the framework of domestic courts.

Now, as Luis Peraza Parga says, "the principle of universal jurisdiction is easy to explain but complicated to interpret and execute[72]. Therefore, since the rule exists, which cannot be ignored, it is necessary

69 To explore the practice, see Rosen, N., "Evaluating the Practice of Universal Jurisdiction Through the Concept of Legitimacy", in *Journal of International Criminal Justice*, Volume 19, Issue 5, November 2021,: 1067–1097, https://doi.org/10.1093/jicj/mqab073

70 Sánchez Legido, Á., Jurisdicción universal penal y Derecho Internacional, Ed. Tirant Lo Blanch, Valencia, 2003: 21.

71 Simon, J. M., *Jurisdicción universal. La perspectiva del derecho internacional público*, in *Revista Electrónica de Estudios Internacionales*, vol. 4, 2002: 26. The same reference in Peraza Parga, L., *Jurisdicción universal: De Argentina a Guatemala, pasando por México*, in *La Insignia*, México, December 2004, http://www.lainsignia.org/2004/diciembre/der_024.htm

72 Peraza Parga, L. La Jurisdicción universal y el ejemplo del Tribunal Constitucional español, in La Insignia, México,

to specify what its origin is or what nature it has, to determine whether it is extensible to the extraterrestrial spatial area.

Practice shows, as will be seen a little later, that the invocation, rather than a conventional rule, is the legal principle or the customary rule, which is invoked. This, even in the field of International Criminal Law, is generally accepted by doctrine, including criminal doctrine[73].

A legal principle is the origin, the core, the reason, the condition, the cause of a norm where ideas, values, concepts are collected, that is, which indicate subjective truths because they belong to the world of what should be[74]. Therefore, we are faced with fundamental legal norms that conform to the legal values or to the *opinio iuris* of universal scope that are contained in positive legal norms.

In this sense, there is a general principle of law, which is key to our analysis, the principle *delicta puniri reipublicae interest* (The punishment of crimes is in the public interest)[75]. Obviously, this general principle of law is transferable to the international legal system applicable to outer space, because it recognizes a fundamental value that informs a legal system, in the whole of it or in a sector of it[76].

From this perspective, universal jurisdiction would not be, prima facie, a general principle of International Law but it would be, as a consequence of *delicta puniri reipubliace interest*, in the sector of International Criminal Law. We are therefore faced with a legal principle of International Criminal Law deduced from a general principle of law, but also induced by the recognition of said principle.

In this context of outer space, then, the principle of universal jurisdiction is a specific principle of International Criminal Law. We are therefore faced with an abstract proposition that provides a basis for the fact that if a rule of International Criminal Law is violated, those interested in its restoration must be all the subjects of the law. It is the very basis by which States are obliged not to recognize unlawful situations.

If we add to this idea that we could be in the presence of serious violations of human rights, which are based on well-established values, such as human dignity, freedom, justice or equality, stated as principles in most of the world's constitutions, we could affirm the existence of a legal principle that attributes competence to the State for the exercise of universal jurisdiction in the necessary case of space activities.

In short, as Yoram Dinstein said a few years ago, "individual responsibility means subjection to penal sanctions. When a human being individually contravenes an international duty, he directly commits it and, therefore, he commits his life, liberty and property. Thus, international obligations are intricately linked to the development of international criminal law"[77].

However, I do not believe that the existence of the principle of universal jurisdiction is sufficient for the exercise itself or for the attribution of competence to a judge to hear the matters involved in it. In addition, an internal legal act would be needed that attributes competence or, at least, a minimum practice that could be invoked as a basis for the existence of the principle in those legal systems that allow it.

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octubre de 2005, http://www.lainsignia.org/2005/octubre/int_006.htm.

73 Fernández Sánchez, P. A., "El derecho aplicable por la Corte Penal Internacional", in Carrillo Salcedo, Juan Antonio (Ed.): *La Criminalización de la Barbarie: La Corte Penal Internacional*, Ed. Consejo General del Poder Judicial, Madrid, 200.: 245-266.ISBN 9788489230248).

74 Díez-Picaso, L. *Los principios generales del derecho en el pensamiento de Federico de Castro*, in *Anuario de Derecho Civil*, t. 36, nº IV, 1983: 1267-1268.

75 This principle is mentioned by Mans Puigarnau, J. M., *Los Principios Generales del Derecho – Repertorio de Reglas, Máximas y Aforismos Jurídicos con la Jurisprudencia del Tribunal Supremo de Justicia*, Bosch, Casa Editorial, Barcelona, 1957: 131.

76 Schawarzemberger, G., *The Fundamental Principles of International Law*, in RCADI, vol. 87, 1955-I, p. 201.

77 Dinstein, Y., *International Criminal Law*, in *Israel Yearbook on Human Rights*, nº 5, 1975: 55.

Would we then be talking about a subsidiary principle? This would seem to be the case if we spoke of it as a corollary of the principle *aut dedere aut judicare*. Now, the obligation *aut dedere aut judicare* is of an exclusively conventional nature, so that, in this conventional context, this obligation aut dedere aut judicare is a corollary of the principle of universal jurisdiction, which, in the context of the general rules of International Law, it is not.

Perhaps, as we will see later, we could call this obligation *aut dedere aut judicare*, as Jaume Ferrer does, territorial universal jurisdiction[78], or conditional, which could explain so much confusion.

It might seem, therefore, that the invocation of this principle of universal jurisdiction could be what some have called a delegated principle. However, in this sense I fully share the idea of Jean-Michael Simon, when he says that it is not a question of "delegating a competence" but of a unique legal interest of the affected States, it is not, therefore, a question of "delegating a competence" but of this interest constituting per se a sufficiently relevant contact in legal terms[79].

It is true that when universal jurisdiction is analyzed as a corollary of the principle *aut dedere aut judicare*, the obligation for the State is resolved with the obligation of the State in the right of option. On the contrary, when the source of the principle of universal jurisdiction has a nature of general norm, no obligation of the State is generated, but, in any case, a right of the State.

In this sense, Professor Sánchez Legido develops this idea, relying not only on the doctrine, individually treated, but on international jurisprudence, on the position of the International Law Commission of the United Nations and, even, on the position of some cases of internal law[80].

Luis Benavides considers that the principle of universal jurisdiction is an exceptional jurisdiction and an auxiliary principle, although he does not believe that the jurisdiction of the territorial State should be preferred[81].

Therefore, it cannot be only the corollary of the principle *aut dedere aut judicare* because this supposes, as I have already said, an obligation of option, within the framework of the conventional. As Professor Benavides points out, universal jurisdiction is the result of a right of the State to exercise this jurisdiction for the commission of certain international crimes, but without obligation. On the contrary, the principle *aut dedere aut judicare* implies an obligation of option or alternative within the conventional framework that establishes it. In fact, Professor Benavides presents an interesting table where he establishes the differences between both legal institutions. Among these differences, in addition to the one already mentioned, he points out the following: universal jurisdiction is a principle based on customary international law, which is applied to a limited number of crimes, exceptionally by all States, while the principle of *aut dedere aut judicare* is a clause of conventional law, which today covers more than twenty conventions with very diverse crimes, which can only be invoked by the States parties[82].

One may or may not share this opinion, but one cannot deny its correct foundation. However, one must bear in mind that, today, the majority of crimes to which both principles can be applied coincide. For example, the legal basis of war crimes is not exclusively conventional, nor is that of genocide (a Convention which, by the way, does not contemplate the principle of *aut dedere aut judicare*), nor

78 Ferrer Lloret, J., *Impunidad versus inmunidad de jurisdicción: la sentencia del Tribunal Internacional de Justicia de 14 de febrero de 2002 (República Democrática del Congo contra Bélgica)*, in *Anuario de Derecho Internacional*, vol. XVIII, 2002: 315.

79 Simon, J. M. *Jurisdicción universal... op. cit.*,: 34-35.

80 Sánchez Legido, Á., *Op. cit.*,: 254 a 258.

81 Benavides, L., *The Universal Jurisdiction Principle: Nature and Scope*, in *Anuario Mexicano de Derecho Internacional*, Vol. 1, 2001: 32.

82 *Ibidem*, p. 36.

that of torture nor that of many others, for this reason, among other considerations, the principle of reciprocity does not operate.

I do not, therefore, fully share the opinion of those who consider, like Eric David[83], that genocide (as with any other crime under international law susceptible to the application of universal jurisdiction, as the International Tribunal for the former Yugoslavia itself does with respect to war crimes[84]) can be subject to the principle of *aut dedere aut judicare*, even though it is not expressly recognized in the 1948 Convention.

I do believe, on the contrary, that the principle of universal jurisdiction can be applied, and this is because the basis and legal foundation is the violation of a norm of *ius cogens*, of a customary and not exclusively conventional nature.

This difference between the principle of universal jurisdiction and the principle of *aut dedere aut judicare* is so important that it is what determines that a large part of the doctrine, including important Judges of the International Court of Justice, have not yet been able to differentiate the two principles. This has led a large part of the doctrine to consider that for the application of the principle of universal jurisdiction, the physical presence of the accused in the territory of the State where it is being exercised is necessary, as if it were the principle *aut dedere aut judicare*, for which this singularity or condition of physical presence is required[85].

I do not believe that the constitution of the principle of universal jurisdiction, in the framework of crimes under International Law, as a legal principle of International Criminal Law applicable to space activities can be doubted, because if not, the impunity of a crime under International Law would be privileged.

The principle of universal jurisdiction should not be confused with the legal institution of the vicarious administration of justice, which is a German and Austrian practice[86] by which German courts have jurisdiction to prosecute foreigners who have committed crimes abroad and who, being in German territory, do not have extradition because it cannot be requested or is not granted or for any other reason it is not executed or applied[87].

As Höpfer & Angermainer would say, the principle of universal jurisdiction only establishes the law without conferring jurisdiction on the custodian state, while the legal institution of the Vicarious Administration of Justice assumes jurisdiction[88].

This has allowed Austrian courts to hear crimes of genocide in view of the absence of an explicit obligation of the Genocide Convention on universal jurisdiction, which has allowed the Vicarious Administration of Justice to award jurisdiction to Austria over the crime of genocide[89].

Now, as Prof. Reinoso Barbero[90] says, this principle of universal jurisdiction cannot contradict other norms, it must be susceptible of application in the absence of them and it must be considered as such, in the case of International Law, by the States, or above all, if it has been recognized by jurisprudence.

83 David, E., *Principes de droits des conflicts armés*, Ed. Bruylant, Bruselas, 3ª ed., 2002: 668.

84 *Case Blaskic (IT-95-14), Judgments of 29 october 1997*, par. 29.

85 On these questions, see Sánchez Legido, Á., *Op. Cit.*: 268-293.

86 See section 7 (2) (2) of the German Penal Code and section 65 (1) (2) of the Austrian Penal Code.

87 Meyer, J., *The Vicarious Administration of Justice: An overlooked Basis of Jurisdiction*, in *Harvard International Law Journal*, vol. 31, nº 1, 1990: 115-116.

88 Höpfer, F. & Angermainer, Cl., *Adjudicating International Crimes*, in REICHEL, Philip: (Ed): *Handbook of Transnational Crime and Justice*, University of Northern Colorado, Greeley, Colorado, 2005, note 70: 336-337.

89 *Ibidem*, note 72: 337.

90 Reinoso Barbero, F., *Los principios generales del Derecho en la jurisprudencia del Tribunal Supremo*, Editorial Dykinson,

Resolution 3074 (XXVII) of 3 December 1973 of the United Nations General Assembly already indicated in its first principle that "crimes against humanity, wherever and whenever committed, shall be the subject of investigation, and persons against whom there is evidence of guilt in the commission of such crimes shall be sought, arrested, prosecuted and, if found guilty, punished."

More recently, on 16 December 2005, the United Nations General Assembly approved the Basic Principles and Guidelines on the Right of Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law to a Remedy and Reparation, among which it states the following:

> "To that end, where so provided in an applicable treaty or *under other international law obligations*, States shall incorporate or otherwise implement within their domestic law appropriate provisions for *universal jurisdiction*. Moreover, where it is so provided for in an applicable treaty or other international legal obligations, States should facilitate extradition or surrender offenders to other States and to appropriate international judicial bodies and provide judicial assistance and other forms of cooperation in the pursuit of international justice, including assistance to, and protection of, victims and witnesses, consistent with international human rights legal standards and subject to international legal requirements such as those relating to the prohibition of torture and other forms of cruel, inhuman or degrading treatment or punishment." (emphasis added)[91].

As can be seen, the General Assembly indirectly recognises the non-exclusively conventional nature of universal jurisdiction. And it undoubtedly represents, by its composition, the *opinio iuris* of States.

The United Nations Commission on Human Rights, in its Report on the issue of impunity for perpetrators of human rights violations (civil and political), in its principle 20, when it speaks of the jurisdiction of foreign courts, it is true that it says that "the jurisdiction of foreign courts is exercised within the framework of a universal jurisdiction clause provided for in treaties in force, or of a provision of domestic law establishing a rule of extraterritorial jurisdiction for serious crimes under international law"[92].

Therefore, it only speaks of a conventional provision or an internal rule but does not say what the basis of the internal rule is, which could not be other than a general rule of Public International Law. The general rule would be universal jurisdiction that would underpin the internal law that establishes the jurisdiction of domestic courts.

In fact, in principle 22, the cited document states that "in the absence of ratification that allows such a universal jurisdiction clause to be applied to a country where the violation has been committed, States may take measures in their domestic legislation to establish their extraterritorial jurisdiction over serious crimes under international law committed outside their territory and which, by reason of their nature, affect not only domestic criminal law, but also the international repressive order to which the notion of borders is foreign."

Within the framework of regional governmental international organizations, for example, the Organization of American States has noted that:

> "The IACHR has already stated that the normative evolution of public international law has consolidated universal jurisdiction, by virtue of which, when the organs of national criminal jurisdiction do not want or cannot fulfill the function of investigating and

S. L., Madrid, 1987: 114-115.

91 https://www.ohchr.org/en/instruments-mechanisms/instruments/basic-principles-and-guidelines-right-remedy-and-reparation

92 Doc. *Distr. General E/CN. 4/Sub. 2/1997/20/Rev.1 2 octuber 1997.*

> punishing such international crimes, any State has the authority to "pursue, prosecute and punish those who appear to be responsible for such international crimes, even those committed outside its territorial jurisdiction or that are not related to the nationality of the accused or the victims, since such crimes affect all of humanity and violate the public order of the world community"[93].

For its part, the European Council of the European Union itself, in its Decision 2003/335/JHA of 8 May 2003[94], without making express mention of universal jurisdiction, does declare that "Member States shall cooperate in the investigation and prosecution of the crimes referred to in Article 1, in accordance with national law and relevant international agreements."

Therefore, it is accepting that there are international treaties that admit universal jurisdiction and that there are national laws that allow it, within the framework of customary international law[95]. What it also seems to say is that s that a national legal basis is required for this.

On the other hand, most of the most qualified doctrine has also established the nature of universal jurisdiction as a general rule of a customary nature, although it is true that others, more interested and with less foundation[96], or not, deny it. For example, Professor FLETCHER denies this character, in his capacity as a criminal lawyer, because he does not understand that customary law serves as a basis for criminal justice and also because, in his opinion, the principle non bis in idem is often at stake. His great concern is the rights of the accused[97].

I can understand these arguments, but I do not share them because in International Law, custom is a very important source of law and, therefore, also of International Criminal Law. In fact, the Statute of the International Criminal Court accepts the customary norm as applicable law[98]. As regards the principle of non bis in idem, it has its particularities in International Criminal Law, because, for example, a person may have been tried and granted an amnesty or a law of final point or a law of due obedience applied, which would entail, at the very least, the violation of the victims' right of access to justice to which they are entitled. In other cases, this legal principle should be guaranteed as the maximum expression of the fundamental content of the right to a fair and equitable trial.

In this sense, the Statute of the Tribunal for the former Yugoslavia determines that a trial before the Tribunal itself, even after the trial in the national court, would be appropriate under the principle of *non bis in idem* if "the national court acts in a partial or non-independent manner, [or] the proceedings were designed to protect the accused from international criminal responsibility..."[99].

We would be talking, now again, about George Scelle's famous theory known as functional splitting, through which he affirms that the executive, legislative and jurisdictional functions of the interna-

93 See *Asilo y Crímenes Internacionales*, of 20 October, 2000, in el the *Informe Anual de la Comisión Interamericana de Derechos Humanos*, OEA/Ser./L/V/II.111 doc. 20 rev., 16 April 2001, http://www.cidh.oas.org/asilo.htm

94 Council Decision 2003/335/JHA of 8 May 2003 on the investigation and prosecution of genocide, crimes against humanity and war crimes, OJ L 118, 14.5.2003: 12/14.

95 Among others, see Rodley, N., *The Treatment of Prisoners under International Law*, Clarendon Press, Oxford, 2nd ed. 1999: 130 y 133. Bodansky, D., *Human Rights and Universal Jurisdiction,* in Gibney, Mark (Ed), *World Justice: U.S. Courts and International Human Rights,* Westview Press, Boulder/San Francisco/Oxford, 1991; Gilbert, G. *Crimes* Sans Frontières*: Jurisdictional Problems in English Law*, in *British Yearbook of International Law*, nº 61, 1992: 63, 415,423, 424; or, in the French doctrine, Huet, A. & Koering-Joulin, R., *Droit pénal international*, Presses Universitaires de France, Paris, 1994: 191.

96 Universal jurisdiction has been contested by Henry Kissinger, who has even gone so far as to call it "judicial tyranny." See Kissinger, H., The Pitfalls of Universal Jurisdiction: Risking Judicial Tyranny, in Foreign Affairs, July/August 2001. This view was challenged by Roth, K., The Case for Universal Jurisdiction, in *Foreign Affairs*, September/October 2001.

97 Fletcher, G. *Against Universal Jurisdiction*, in *Journal of International Criminal Justice*, vol. 1 (2003), pp. 580-584.

98 Fernández Sánchez, P. A., *El derecho aplicable por la Corte Penal Internacional*, *op. cit.*: 245-265.

99 *The Prosecutor v. Dusko Tadic, a/k/a "Dule"*, Case No. IT-94-1-AR72 (13 Feb. 1995).

tional community are performed by the same internal organs of the national legal systems that act as international organs. In short, when International Law is applied, an internal court is acting as an international one[100].

To be honest, Scelle was not thinking that an internal agent, for example, a judge, has a double role, one internal and one international simultaneously, but, as Antonio CASSESE explains very well, that he operates as a Mr. Jackel and Mr. Hyde, exhibiting a double personality, in other words, they are national organs that can function as national or international agents[101].

In fact, when Antonio Cassese asks himself whether this doctrine can be valid today, he comes to the conclusion that, in an international society that remains strongly inter-state, where many internal judges, in the exercise of universal jurisdiction, act on behalf of the international community as a whole, safeguarding the international legal order, it is where Scelle's doctrine of functional splitting is perceived to be fully in force. And, obviously, I agree with the Florentine master. Carlos Villán Durán thinks the same[102].

In this sense, as Delmas-Marty says, "criminal law can be applied, by virtue of the principle of universal jurisdiction, by national judges who are thus "globalized." As international norms are integrated into internal law, national judges become in effect, through a sort of "functional splitting," the guardians of international law (regional or global), in the sense premonitory imagined by Georges Scelle in the 1930s. The conditions vary depending on whether or not the system admits direct applicability, but it is sufficient that the matter falls within its ordinary jurisdiction (territorial or personal). More surprising is that the "globalization of judges" leads to an extension of their jurisdiction to facts that have no connection with the State (facts committed abroad by foreigners, on foreign victims). This universal jurisdiction should logically be based on the protection of universal values"[103]

Regarding doctrine, for example, the Resolution of the *Institut de Droit International* on Universal Criminal Jurisdiction regarding the crime of genocide, crimes against humanity and war crimes, adopted on August 26, 2005, recognizes that "universal jurisdiction is based primarily on customary international law."

At the conventional level, International Treaties have been signed that not only sanction criminal conduct against humanity but also establish as a general principle in all of them that of a possible universal jurisdiction, by establishing the obligation to judge or extradite and not exclude any other criminal jurisdiction. Therefore, the corollary of this obligation *aut dedere aut judicare* and of not excluding any other criminal jurisdiction is the conventional possibility of using universal jurisdiction. The range is very varied.

For example, in the context of armed conflicts, the four Geneva Conventions on International Humanitarian Law of 12 August 1949 and its Additional Protocol I, the Hague Convention on the Protection of Cultural Property in the Event of Armed Conflict of 14 May 1954 and its Second Additional

100 Among others references, see Scelle, G., *Droit International Public: Manuel Élémentaire*, Paris, Domat-Montchrestien, 1944: 21-22; also, Scelle, G., *Théorie du gouvernment international*, en *Annuaire de l'Institut de droit public*, 1935: 54-57; or Scelle, G., *Théorie et pratique de la fonction exécutive en droit international*, in *Recueil des Cours de l'Académie de La Haye* vol. 5, 1936: 91-106.

101 Cassese, A., *Remarks on Scelle's Theory of 'Role Splitting' (dédoublement fonctionnel) in International Law*, en *European Journal of International Law*, 1990, vol. 1, note 6. To follow the entire plot line, see pp.210-34.

102 Villán Durán, C., *La protección internacional de los derechos humanos en el Sistema de las Naciones Unidas y de sus organismos especializados*, in *Memorias del Seminario los Instrumentos de Protección Regional e Internacional de los Derechos Humanos*, Secretaría de Relaciones Exteriores, México, 2004, 71.

103 Delmas-Marty, M., *Estudios jurídicos comparados e internacionalización del derecho*, in http://www.college-de-france.fr/media/int_dro/UPL24919_rescoursespdm0203.pdf, p. 20.

Protocol of 26 March 1999 or the International Convention against the Recruitment, Use, Financing and Training of Mercenaries of 4 December 1989, even with its enormous limitations[104], establish the universal jurisdiction that we have had occasion to point out.

This principle of universal jurisdiction is included in the 4 Geneva Conventions on International Humanitarian Law. It is in this body of law where this principle is explicitly reflected. Thus, Article 49 of the First Convention, for example, states the following:

> "...Each Contracting Party shall be obliged to seek out persons accused of having committed or ordered the commission of any of the grave breaches and shall bring them before its own courts, whatever their nationality. It may also, if it so prefers, and in accordance with the provisions of its own legislation, hand them over to be tried by another interested Contracting Party, if the latter has formulated sufficient charges..."[105].

As can be seen, the scope of this obligation is not limited to the principle of *aut dedere aut judicare* but goes beyond that and contemplates full universal jurisdiction.

In addition to this issue, it should not be forgotten that on November 26, 1968, the Convention on the Non-Applicability of Statutory Limitations to War Crimes and Crimes against Humanity was signed, which, although it has not been widely ratified, practice shows that it is considered customary law. This is evidenced by the constant trials that are still taking place against war crimes or crimes against humanity during the Second World War or in subsequent situations, against which the exception of incompetence *ratione temporis* and the exception *rationae personae* or *ratione loci* are never applicable.

In this sense, the French Court of Cassation that judged the Klaus Barbi case, in its judgment of December 20, 1985[106], considered crimes against humanity to be imprescriptible, and therefore considered itself competent to judge the acts committed during the Second World War[107]. The same thing happened when an American television channel discovered Erick Priebke on May 9, 1994, living in Bariloche, Argentina. Italy requested his extradition, accusing him of the reprisal carried out on March 24, 1944 when, together with Karl Hass, 335 people were arrested and shot on the Via Ardeatina in Rome. Priebke and Hass were sentenced to life imprisonment by the Military Tribunal of Rome on March 7, 1998.

For its part, the Additional Protocol I to the four Geneva Conventions states in its article 86 that

> "The High Contracting Parties and the Parties to the conflict shall repress grave breaches, and take measures necessary to suppress all other breaches, of the Conventions or of this Protocol which result from a failure to act when under a duty to do so".

Therefore, it speaks of an obligation of the High Contracting Parties, beyond the fact that they are Parties to the conflict, that is, the obligation to suppress and take such measures as may be necessary to put an end to all other breaches… resulting from failure to comply with a duty to act by any State Party.

Article 88 of the same Protocol obliges the High Contracting Parties to provide "the greatest measure of assistance in connection with criminal proceedings brought in respect of grave breaches of the

104 Fernández Sánchez, P. A. (Ed.) *The Limitations of the Law of Armed Conflicts: New Means and Methods of Warfare*, Brill/Nihjoff, Leyden (The Netherlands), Boston (USA), 2022 (ISBN: 978-90-04-46885-6).

105 This provision is also included in Article 50 of the Second Convention, Article 129 of the Third Convention and Article 146 of the Fourth Convention.

106 *Journal de Droit International*, 1986, pp. 129-142.

107 For a more detailed study of the circumstances taken into account by the Court, see the study of Wexler, L.S., *The interpretation of the Nüremberg Principles by the French Court of Cassation: From Touvier to Barbi and back again*, in *Columbia Journal of International Law*, vol. 32, 1994.

Conventions or of this Protocol" and, "The law of the High Contracting Party requested shall apply in all cases. The provisions of the preceding paragraphs shall not, however, affect the obligations arising from the provisions of any other treaty of a bilateral or multilateral nature which governs or will govern the whole or part of the subject of mutual assistance in criminal matters".

In the context of serious infringements of cultural heritage in periods of armed conflict, Article 16-2 of the Second Additional Protocol of 26 March 1999 to the Hague Convention on the Protection of Cultural Property in the Event of Armed Conflict of 14 May 1954 states the following:

> "With respect to the exercise of jurisdiction and without prejudice to Article 28 of the Convention: (4 this Protocol does not preclude the incurring of individual criminal responsibility or the exercise of jurisdiction under national and international law that may be applicable or affect the exercise of jurisdiction under customary international law".

If we look closely, it speaks of the exercise of jurisdiction under applicable international law or customary international law, which cannot be other than universal jurisdiction.

Finally, article 9 of the International Convention against the Recruitment, Use, Financing and Training of Mercenaries of December 4, 1989, clearly states that "The present Convention does not exclude any criminal jurisdiction exercised in accordance with national law". Therefore, it is admitting universal jurisdiction as long as it is admitted in domestic law.

In another criminal framework, and without meaning to be exhaustive, we can find the Tokyo Convention on Offences or Other Acts Committed on Board Aircraft of 14 September 1963, in its article 3.3, "this Convention does not exclude any criminal jurisdiction exercised in accordance with national laws", as well as article 4-3 of the Hague Convention for the Suppression of Unlawful Seizure of Aircraft of 16 December 1970 or article 5-3 of the Montreal Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation of 23 September 1971 or article 3-3 of the New York Convention on the Prevention and Punishment of Crimes against Internationally Protected Persons, including Diplomatic Agents of 14 December 1973 or art. 5-3 of the New York Convention on the Taking of Hostages of 17 December 1973 or art. 6-5 of the Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation of 10 March 1988 or Article 5-3 of the Convention against Torture and Other Cruel, Inhuman and Degrading Treatment or Punishment of 10 December 1984 or Article 6-2 of the European Convention for the Suppression of Terrorism of 27 January 1977.

It is true that none of these international conventions make express mention of the principle of universal jurisdiction, but from their respective texts we can deduce the imposition of the principle *aut dedere aut judicare*, the preference of jurisdictions in relation to the place where the crime was committed, the nationality of the offender or the place of detention, and the reference to any other criminal jurisdiction. Therefore, in my opinion we are talking about universal jurisdiction, that is, the possibility that a person can be tried by any State for crimes under international law committed abroad, against nationals or even against foreigners[108]. This is also a majority opinion in both Spanish and foreign doctrine[109].

108 The Convention for the Suppression of the Traffic in Persons and of the Exploitation of the Prostitution of Others of 21 March 1950 establishes for the first time in a clearer manner the principle of universal jurisdiction.

109 Among them, see Abellán Honrubia, V., *La responsabilité internationale de l'individu*, in *Recueil des Cours de l'Academie de Droit International*, vol. 280, 1999, p. 373; Remiro Brotons, A., *El caso Pinochet. Los límites de la impunidad*, Biblioteca Nueva, Madrid, 1999, p. 56. Among Foreign doctrine, it is enough to look at the separate opinions of the Judges Buergenthal, Kooijmans & Higgins, in the *Case concerning the Belgian arrest warrant against the Congolese Minister for Foreign Affairs*, judgment of 14 February 2001.

Moreover, there have been cases in which what is being analysed is not the State's right to universal jurisdiction, but the obligation *aut dedere aut judicare*, even if it is not formally included in a treaty. Let me explain, the German Constitutional Court, in a case where it was a matter of interpreting article 7 of the Convention against genocide, which establishes that "For the purposes of extradition, genocide and the other acts listed in article III shall not be considered political crimes. The contracting parties undertake, in such a case, to grant extradition in accordance with their legislation and the treaties in force", and referring to this article, stated the absolute obligation of Germany to extradite or prosecute. In this way it said that the "Federal Republic of Germany would be obliged to comply with an extradition request from Bosnia-Herzegovina"[110].

CONCLUSIONS

Outer space is an unregulated world because, until now, some conventional rules have been defined but they have been very precarious, either due to the number of States parties or the limited scope of their purpose.

On the other hand, there has been very little practice in space activities, not only because of the technical difficulties and costs of operations but also because of the lack of scientific knowledge to be able to calculate the benefits that these space activities could bring.

However, in recent years there has been an enormous multiplication of activities, which go beyond those of the States, which involve companies, people, diverse themes and so on.

We jurists must provide solutions to the enormous legal challenges that will necessarily arise.

And the fact that there is a *corpus iuris specialis*, as I have said, is not enough. We need to arbitrate solutions for the issues that will arise.

Within the framework of strict International Criminal Law, which is the subject of my reflection, questions may arise arising from the commission of international crimes, which may be committed by States, by private companies, operators or owners, and by individuals who participate, directly or indirectly, in space activities. These crimes include, among others, aggression, genocide, crimes against humanity and war crimes, which must be accompanied by a procedure for prosecution, an accusation if appropriate and, where appropriate, a criminal sanction.

Can outer space be considered to operate as a legal space, projected by the earth? Even if this were the case, International Law (including, therefore, International Criminal Law) is eminently interstate and, in any case, even recognizing the existence of international spaces where the legal norms of International Law operate and the existence of global goods[111], which require obligations *erga omnes*, the application of the norms cannot be extended to the parceled framework of a territory, as is done on Earth.

Therefore, we have to resort to analogous processes of interpretation, taking into account general criteria, principles and legal instruments that allow us to establish State competence to determine jurisdiction.

110 Bundesverfassungsgericht (2000), „BVerfG, 2 BvR 1290/99 von 12.12.2000", 82. (http://www.bverfg.de/entscheidungen/frames /2000/12/12).

111 The emergence of this new concept has been conceptualized since the very birth of International Law (then called totus orbis) but has been revitalized and recognized recently. See Fernández Sánchez, P.A., "¿De verdad Francisco de Vitoria fue el padre del derecho internacional?", in *Anuario Mexicano de Derecho Internacional*, vol. XXII, 2022, pp. 151-193 (ISSN 1870-4654).

In this sense, I have dealt with two issues that seem essential to me in the framework of International Criminal Law: State competences and the application of reconcilable and practicable principles in this sector of Law.

Within the framework of competence *ratione loci* or *ratione geographiae*, there is not even a legal delimitation of when the airspace of a State ends or when outer space begins. This means that States can be considered to cease to have territorial jurisdiction outside the limits of the atmosphere, regardless of where that limit is located.

However, current space activities are carried out within the spatial framework of artefacts or objects that are either state-owned or registered and subject to a specific State. There is even an international treaty that regulates the state jurisdiction of the States present on the International Space Station, where legal issues of a criminal nature have already arisen, with jurisdiction being attributed in accordance with that treaty.

Another competence to be taken into account is the competence *ratione materiae*. This framework of competence can determine the attribution of responsibility, whether objective or subjective. It is clear that the rules contemplated in the *corpus iuris spatialis*, by reason of their own subject matter, are designed for legal operators who carry out space activities.

When an activity resulting from the exploration or use of outer space gives rise to state or individual responsibilities, States are competent *ratione materiae* to apply its legal effects, when responsibilities may arise from the consequences. This is especially relevant in the context of International Criminal Law.

Perhaps the most important jurisdictional framework is the jurisdiction *ratione personae*, because it is where the State's jurisdiction in a space not assigned to another State is best based. Therefore, this type of jurisdiction draws heavily on the law of the sea, which also draws on air law.

In fact, many States have regulated this type of jurisdiction to attribute jurisdiction in the State in question.

As for the jurisdiction *ratione temporis*, it is much more complex. The presumption, until now, is that the measurement of time in outer space is the same as on Earth, which is not true. Not even on Earth is time measured the same in all meridians, which leads to different timetables being established, even in the States that have jurisdiction with several meridians.

For the purposes of applying international treaties, there are rules contained in the Vienna Convention on the Law of Treaties, so, in any case, if there were treaties, it would be necessary to abide by what is determined in them. This is particularly relevant in the framework of International Criminal Law because it can determine international criminal responsibility based on the time of the commission of the crime, or even the continuity of the crime. Let us think about the disappearance of a person or another international crime.

As for the specific legal principles of International Criminal Law, which may be applied to space activities, I have collected three of them: the principle of extraterritoriality, the principle of territorial extension of the norm or "contingent unilateralism" and the principle of universal jurisdiction.

The State, in principle, has exclusive and excluding jurisdiction over its own territory. This complicates the exercise of its own jurisdiction in outer space, because the State does not have territory in said space.

However, territorial jurisdiction is not an absolute right. There are doctrines that operate as effective control, personal control or authority and control, which serve to be able to exercise, where appro-

priate, the principle of extraterritoriality. For its exercise, the cooperation of other States is required. Therefore, in the case of the commission of an international crime, imputable to a person, legal or physical, the cooperation of another State can be requested so that it makes the potential accused available to national judges.

The Law of the Sea has given us some experiences that can be transferred to outer space, such as the flag of the ship, even the responsibility of the commander, etc., which can be perfectly transferred to outer space.

However, there are times when another legal principle can also be invoked, which does not even require international cooperation, I am referring to the principle of territorial extension of the norm or "contingent unilateralism". It is true that this principle is relatively new and that it has little practice but that it can be very attractive, as it has been in the framework of the fight against climate change.

This doctrine would allow to give global scope to the regulations of International Criminal Law. This could be so because the rules are directed at the States themselves, their bodies, their officials, their nationals, whether companies, NGOs or private citizens, dependent on the jurisdiction of a particular State, who are operating in outer space.

Finally, the principle of universal jurisdiction, which is especially practiced in the commission of international crimes. Its legal nature, as has been demonstrated, is that of a general principle of International Law, a customary norm and of a conventional nature, in those treaties that include it as an obligation derived from the conventional corollary of the principle *aut dedere aut judicare*.

There is no situation in which this principle cannot be applied in space activities, because it supposes a generalized and consolidated *opinio iuris*, as long as its express regulation is included in the internal regulations of the States and their courts can exercise jurisdiction, in accordance with their own laws.

It is true that the States have been regulating the exercise of this principle, taking into account cases of territoriality or active nationality.

Obviously, when we are faced with international conventional rules that expressly include the principle of the exercise of universal jurisdiction, national law must give way to international criminal law because otherwise international liability could arise. There are many international treaties that include this obligation, especially in the area of major international crimes, including crimes against humanity and war crimes.

Seville, September 14, 2024

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PREPARING HUNGARIAN POLICE CADETS TO DEAL WITH UNEXPECTED SITUATIONS AND LEAD OPERATIONS

Gábor Kovács, PhD[1]
Ludovika University of Public Service, Budapest, Hungary

INTRODUCTION

The main target group of the Ludovika – University of Public Service (UPS) is the community of young people who are choosing a professional career in the Hungarian civil service. The development of the University is guided by the three interdependent University Institutional Development Plan, developed in the spirit of Article X. of the Fundamental Law of Hungary. The University is an institution of freedom of scientific research, learning and teaching. A specific feature of the university is that the organization also includes the armed forces (defense and law enforcement). The "uniformed" courses have specific requirements, but they must comply all the general requirements of the Hungarian higher education system.

The University's management and the teaching community are highly committed and consider education and research as a form the police service.

The university currently has four faculties: the Faculty of Law Enforcement, the Faculty of Military Science and Officer Training, the Faculty of Public Governance and International Studies and the Faculty of Water Sciences. All four faculties work very closely together, with students studying common subjects together. From 1 August 2024, the four faculties will be joined by a fifth, the Faculty of Teacher Education.

The Ludovika – the University of Public Service has declared this in its Institutional Development Plan.

"The medium-term vision of the Institutional Development Plan is to become the University of Public Service:

- The University of Public Service should be the best and most attractive university in Hungary,
- A stable educational and research base for the development of the Hungarian civil, military and law enforcement services;
- A committed supporter of Hungarian-language higher education in Hungary and abroad;
- Active participant in international higher education and academic relations in alliance with the leading universities of Europe and the world". (National University of Public Service Institutional Development Plan 2015-2020; 2021-2025)

Our common goal is that our University will be one of the best and most attractive universities in Hungary in 2025, a stable educational and research base for the development of the Hungarian civil service, a stable career in the civil service, and a committed supporter of Hungarian-language higher education in Hungary and abroad.

1 kovacs.gabor@uni-nke.hu

The efforts to unify the universities have also brought about a significant transformation of the educational structure. Already in the academic year 2013-2024, the teaching of the Common University Module started in the new subject structure (Ludoviceum), which complemented the range of knowledge already taught.

The aim of the common subjects, introduced in September, was to:

- to provide undergraduate students in the co-disciplines with a basic knowledge of the whole spectrum of the state and the civil service,
- the common core of the civil service to promote an understanding of the roles and functioning of other civil service professions,
- support the convergence of careers in the public service,
- provide for inter-peer learning and transfer between UPS peers,
- provide a shared learning experience for students from the peer groups.

The subjects of the Common University Module have been designed to train students in the full functioning of the state. The subject structure covered all areas of the public sector: civil administration, international affairs, law enforcement, defence, disaster management and national security.

The Hungarian law enforcement officer candidates acquire modern knowledge, have a solid moral foundation and like their country. The young officers are excellent in their first assignments in the various law enforcement organizations. The university's expectation that University of Public Service will provide a supply of professionals capable of meeting the challenges of the 21st century is being met.

PREPARATION OF POLICE OFFICER CANDIDATES FOR LEADERSHIP TASKS

The law enforcement officer's candidates are prepared during their training period to have an impeccable professional knowledge. From the first day of basic law enforcement training, they are prepared to perform leadership tasks. The cadets will acquire the practical leadership competences that will be necessary for the performance of their future leadership work. In the subject of "Leadership and Management Theory", the cadets learn the basics of management theory, which provide a solid theoretical foundation for leadership and management. The practical leadership exercises, practical sessions, internships and coaching all contribute to the development of cadets' leadership and management skills.

LEADERSHIP TRAINING AND MANAGEMENT IN EMERGENCIES

According to the (1) § 1 of *the Hungarian Police Act, "Police of the Republic of Hungary is responsible for public safety, public protection and guarding of the state border, control the border traffic and maintaining order in the state border."*

During the emergency the leadership methods are different. For the cadets, the theoretical and practical preparation in the frame of the "Common Public Service Exercise" course provides theoretical knowledge. The theoretical and practical knowledge is acquired in order to be able to carry out tasks

in operational teams. The course concludes with an exercise, which solves a current and up to date law enforcement problem.

According to the provisions of the Fundamental Law, the Police Act, the Defence Act, the Disaster Management Act, the tasks to be carried out require the creation of temporary organisational elements for each organisation. For the effective implementation of these tasks, it is necessary to establish temporary, leading and controlling organisational elements (operational staffs) within the organisations. A risk situation is defined as a situation that is "out of the ordinary" as a result of some event requiring law enforcement intervention.

The organisations involved the management in order to solve the risky situations, and carry out their tasks in cooperation with other partner organisations. In general, each organisation carries out the activities that fall within its own remit, thus increasing efficiency. Proof that the one of the principle of cooperation is synergy can also be found work here.[2]

Such extraordinary situations may include for example: acts that threaten the security of the country's borders; acts that threaten public order or public security; management of extreme weather conditions, damage repair and mitigation (snow, floods, heat, etc.); management of epidemics and mass outbreaks of disease; management of illegal migration on a massive scale; securing and managing other mass movements; other extreme events (the range of which can be very wide).

WORK AND DIVISION OF TASKS BETWEEN THE COMMANDER, THE STAFF AND SUBORDINATES

One of the most essential prerequisites for the successful operation of a command and control system is the establishment of a relationship between the commander and subordinate organization, and the creation of conditions for coordinated work. The commander is responsible for the activities of the organization at their level, in accordance with the principle of one-man command, and is largely supported in their work by the staff. The staff of the superior staffs shall not interfere directly in the work of the subordinate staffs.

There are three channels of communication in the operational control system: command; inter branch; and technical.

1. Command communication is the direct link through which orders and instructions reach subordinate commanders. This channel is established between commanders.

2. Inter-branch communication is the link between the staff officers assigned to the staff.

3. Technical communication is the means of transmitting information through which other data is exchanged (e.g., live video feed from the scene, meter readings, etc.)

One of the most important tasks of the staff is to plan and coordinate the cooperation. The aim of cooperation is to ensure that those involved in the operation are working towards common goals.

One of the most important tasks of the staff is to plan and coordinate the cooperation.

2 The word "synergy" is of Greek origin, literally meaning "cooperation". This term refers to the fact that, compared with the result of the separate operation of the available means of force, the effect of their simultaneous and coordinated application results in a quantitative and/or qualitative surplus.

The aim of cooperation is to ensure the success of the organization's activities. Ensuring that the participants in the operation comply with the law and the internal standards of the agencies, by asserting their powers and responsibilities, by defining the tasks precisely, by carefully selecting the location of deployment, by identifying the forces and means of cooperation, by coordinating their activities, and by specifying deadlines, responsibilities and requirements.

General characteristics of the cooperation:

- cooperation is organized on the basis of competence and jurisdiction between bodies, organizations and individuals of the same level and with similar interests, without being subordinate to each other,
- closely regulated at the highest level /orders, commands, measures, agreements, contracts/,
- organized from the top down,
- organized on the basis of reciprocity,
- planned and organized at international, national, central, regional and local levels,
- the cooperation results in an increase in the proportion of forces and assets that can be mobilized and, consequently, in the effectiveness of the organization (e.g. additional information from the National Security Agency). Kovacs, G (2020).

General requirements for cooperation: recognition of the cooperation situation and bodies; existence of common interest (organizational, national, international); proactive action; targeting in the selection, involvement and use of bodies; common rules of application, planning, organizing; common knowledge; continuity, etc.

The organization and maintenance of cooperation should be treated as an essential part of management and staff work and a permanent feature of management activity at all levels of management.

The leaders coordinate the joint activities of their organisations, the use of forces. The commanders and commanding officers shall pass on their tasks to the executive officers in good time, in accordance with changes in the situation, and shall together clarify or reorganize the previously established arrangements for cooperation.

In general, the cooperation can be organized on a traditional or digital map, in the field or on a field table. In special cases, it can also be organized in other ways, e.g. on a model. Instructions on the order of cooperation may be recorded in written orders, an accepted and established form is the recording in an action plan.

The success factors for cooperation are as follows:

- precise knowledge and practice of one's own tasks,
- knowledge of the rules and requirements for the use of own and cooperating bodies,
- knowledge of the tasks and rules of application of the cooperating bodies,
- coordination of the activities of the participants,
- regular and timely mutual information,
- organizing and maintaining reliable liaison,
- the definition of uniform cooperation signals and signs,
- practicing cooperation tasks,
- respecting each other's powers and competences,
- continuity of provision.

DECISION-MAKING TECHNIQUES IN EMERGENCY SITUATIONS

If we look at the functions of management, we can see that information gathering and processing, analysis, pre-decision planning and decision-making, organising, managing, control and evaluation of the complex system. Czuprak-Kovacs (2014a: 121).

The decision-making is one of the most important elements. The management theory literature uses different techniques to describe the methods of decision-making. Czuprak-Kovacs (2014b: 145). The first is the *planned decision*: the essence of this method is that the decision-maker breaks down the process into separate parts, with the advantage that it allows a partial and comprehensive analysis. This planned decision is possible when the time is not an urgent factor.

The situation is different when the activity has already started, or a situation has developed that is different from the one planned, or the original decision has to be modified and a new decision has to be taken. This requires a *dynamic decision-making process*. In this case, the operational staff only carries out an analysis of the most important moments and the decision/decision is taken based on the results.

Nowadays, it is becoming increasingly important for the operational command and control system to be able *to take rapid decisions* beyond the dynamic decision. In making a quick decision, the operational staff also effectively supports the leader. A particularity is that the time available in this case is even less than the time available in the dynamic decision.

Immediate reaction is the most useful and important leadership method today, since in the vast majority of cases there is not enough time for the commander and his staff to plan the whole leadership process.

In many situations, the method of *immediate reaction* must be used. The commander uses the command methods he has acquired up to that point, applies his existing experience and analyses the data provided by the staff. Based on this, he reaches a decision. Subordinate organisations are usually led/directed by the leader in the form of verbal orders. This may include, for example, immediate response to real-time events through immediate counteraction on the part of the organization. A very important factor in the method of immediate response is that the activities of the commander, the staff and the executives are well rehearsed and the professionalism of the colleagues is excellent.

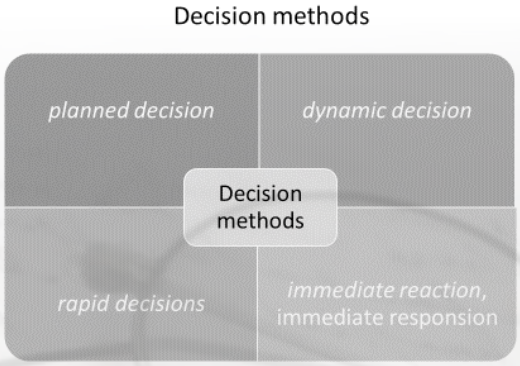


Figure 1. *The Decision Methods*

It is important that all leaders and organisational elements know and practice all management/governance systems. The varied application of these methods will ensure that the operational core will provide a credible response to the evolving situation and that the commander/leader will lead and

direct the activities of the organisations in a way that will ensure effective law enforcement in dealing with the evolving situation. Kovacs-Horvath, (2014).

In considering the specifics of emergency management, it should be noted that the time available for planning is minimal, when using the immediate response method. The number of operational staff that can be involved in planning is also minimal. The briefing of the members of the team itself takes time, the processing of the data, takes time and therefore the need for managerial flexibility is greatest when using this method of working.

It is not necessary to involve a large number of staff in the immediate response-driven activity. The staff involved in the planning and implementation of tasks must have a high level of professional and managerial competence. In this case, the use of a small but highly prepared operational team may be appropriate.

It should be noted that in the case of an *immediate response*, there are usually no pre-defined courses of action. It is up to the expertise and experience of the leader to decide when and how the organisation should react. An important factor is that the manager's working method is characterised by real-time and rapid communication, rapid instructions and immediate execution of orders. Compliance with and fulfilment of instructions and orders is the first responsibility of subordinates.

In applying this method, the manager's excellent professionalism plays a significant role. The awareness and development of these skills is a key focus of university education.

The increased emphasis on the specificities of emergency management during the bachelor and master courses ensuring that all students are familiar with the various leadership/management methods and are able to implement the leadership/management of the organisations. The cadets have the confidence, skills and competence to do so.

The majority of risk situations may also require a redeployment of forces and assets. However, these actions and needs can often be localised and well defined in time. They cannot, however, do without a coordinated, multi-stakeholder and personally accountable, well-founded decision-making process, a series of decisions and coordination of the implementation of actions.

THE COMMON PUBLIC SERVICE EXERCISE

The Ludovika - University of Public Service has created the "Ludoviceum" subject group, which includes the subject "Common Public Service Exercise". The aim of the subject and the practice is to train students in the theory and practice of certain elements of management functions, and to carry out certain activities in practice.

Since 2003 every year, "Common Public Service Exercise " (hereafter "the Exercise") has been conducted, with a wide variety of topics. They have included the management of a flood emergency, the management of a conflict situation at a state border, the management of an emergency caused by extreme winter weather conditions, the management of a cyber-attack, the management of the consequences of a virus situation that could spread to humans, the management of a mass illegal migration along a state border reinforced by a temporary security barrier, the war in the neighbouring countries.

In all cases, the leaders of the exercise consider the motivation and interest of the students to be of paramount importance. The Department of Law Enforcement Management aims to achieve the following didactic process in all its exercises. In the opening lecture of the course, the teachers provide the background material to help the students recognise that such situations can arise at any time. They recog-

nise that, once they have completed their schooling, they will have to deal with these situations in accordance with their professional rules. This motivational part is followed by the transfer of knowledge and skills. Kovacs, G (2020) The instructors of each profession will present the management system of their respective operational staff, the work they do there and the opportunities for cooperation.

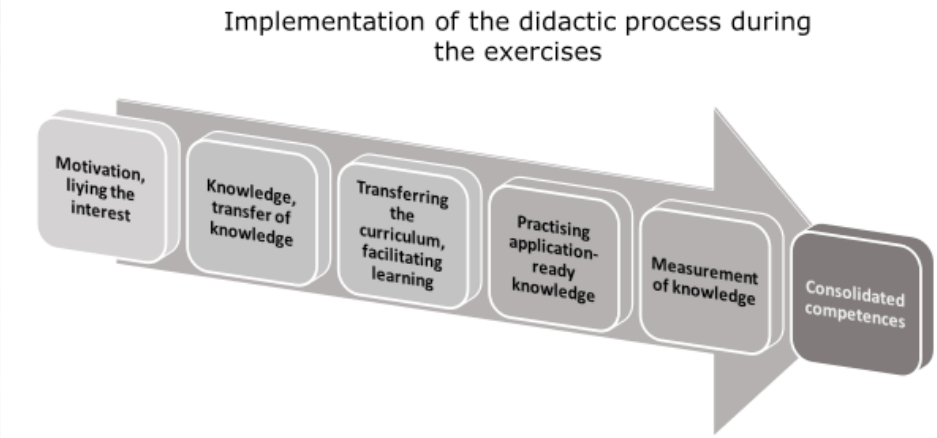


Figure 2. *The Didactic Process During the Exercises*

The curriculum is handed over to the students. In the textbook "Public Service Operations Management Systems" (Kovács G, 2017: 95), all the tasks to be carried out in the operational staff of the profession are elaborated, supported by excellent practical examples. These algorithms provide excellent help to students in the implementation of each activity.

These sessions, which include the specificities of the profession are followed by the practice of adaptive knowledge, which consists of preparatory sessions. This involves preparing the students to carry out tasks in the various operational units according to their specific assignments. This module includes two full days of exercise, where the knowledge acquired is put into practice. All student activities will be monitored by an observer (by referee) who will evaluate the students' activities. At the end of the exercise, the implementers must obtain a practical mark.

During the exercise the aim to solve complex problems. Each profession carries out its own professional task in cooperation with the other professions. The leaders of the exercise emphasise that some of the activities carried out in practice, e.g. guarding the state border, object protection, operating checkpoints and other practical tasks.

Where the activities are not directly related to the subject of the exercise, those professional elements will carry out tasks related to their narrowly defined profession. For example, criminal investigators investigate various crimes in the tactical house, based on the set situation, and traffic police officers investigate road accidents. The organisers aim for each cadet to carry out his or her own professional tasks during the exercise, but also to put their knowledge into practice.

The timing of the exercise ensures that students can apply the management theory they have acquired, complementing their existing professional knowledge, combining the two. The expectation is that the student will be able to make appropriate professional decisions based on his/her professional knowledge, to manage subordinate organisations accordingly and to involve the subordinates with which is required to cooperate in the implementation of tasks.

The main elements of all the exercises carried out are as follows:

– Phase 0: Low-intensity operations, the normal duty of the county police headquarters is to prepare for reinforced service, to receive reinforcements.
– Phase I: Management of low-intensity incidents. Preparation of reinforcement of the county police headquarters.
– Phase II: Organising and implementation of the reinforced service of the county police headquarters.
– Phase III: Preparation of tasks related to the declaration of a state of emergency. Activities of the county police and management of the emergency.
– Phase IV: Withdrawal of the reinforcement forces, return to the basic service. Kovacs, G (2020).

During the processing of these tasks, participants will have the opportunity to study the actual situation, and the necessary background material for the exercise is available.

Each operational staff have a separate workspace, but common interfaces also be created where students can exchange information in real time. The digital interface also allows for the sharing of different documents. The operational staff also must have excellent know-how of these tools in the implementation of the exercise, so that they can work from common databases, background material and share the materials.

The students assigned to each staff easily use the different communication channels (Microsoft Teams, email, etc). In addition, an e-mail correspondence system set up where each participant and each organisation have an individual e-mail account. During the preparation process, communications and information uploaded to the digital mailing system and automatically sent to each element of the different management levels. These two systems are complemented by the Moodle system, where the students staff can find all the support material what they need to carry out their tasks.

The exercise is facilitated by a logical communication system. Each communication is an approximation of the reality, the peculiarity is that the leading bodies do not receive all of them, but the executors receive different information.

The prepared Instructor's Deduction Plan details the date of the communication, who, to whom, when, how, and what content was sent. In addition, the trainer's plan also includes what the trainees are expected to do.

The referees have been given access rights to monitor the activities of the students in virtual and real space, and they are actively involved in following the progress of the exercise through the use of various digital interfaces. According to the discretion of the exercise leaders, the exercise is "free-flowing" and therefore the exercise leaders have no say in the execution of the tasks. The students also have the possibility of making mistakes, the consequences of which must be borne by the organisations they lead, just as they would be in a real situation. If a mistake is discovered, the student can correct it.

By monitoring and analysing the activities of students on a person-by-person basis, the decision-makers are able to gain a continuous picture of the different activities. Kovacs, G (2021, 56.). In the course of the exercise, the organisers place great emphasis on monitoring the system of information flow, and the number of e-mails received and sent, their breakdown by workplace, and the effectiveness of the activities of a particular department, working group or management level.

CONCLUSION

Understanding the different management systems is very important for all police officer candidates. This theoretical knowledge must not only be known, but also practised in order to ensure the self-confidence of future leaders.

The development of any leadership exercise is time-consuming and requires very meticulous and conscientious work on the part of those who develop it. The background material must be prepared in such detail and in such a way that the exercise can be carried out without problems. In addition to thorough preparation, it is very important that students be highly motivated and able to assimilate all the background information so that they can perform the various management tasks in accordance with the real situation and their level of management and position in the exercise.

Summary findings:

- Leadership training is important for police officer candidates. They need to be familiar with all elements of the leadership process, especially decision-making methods.
- All participating students must be highly motivated.
- Preparing for and participating in the exercise is a major contribution to the students' general and professional leadership preparation.
- Everyone should identify with the practitioner's role and be prepared to carry out his or her tasks from both a managerial and a professional level.
- All participants make effective use of computer tools to ensure a multilevel and dynamic flow of information.
- The planning, organising and delivery of the exercises was very successful.
- All of the participants and decision-makers agreed that the exercise was useful.

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CORRUPTION AND MONEY LAUNDERING IN THE REPUBLIC OF NORTH MACEDONIA

Svetlana Nikoloska, PhD[1]
Faculty of Security – Skopje, University "St. Kliment Ohridski", Bitola
North Macedonia

INTRODUCTION

Two negative social phenomena of corruption and money laundering are occurring in parallel in the United States. Namely, money originating from organized crime, to be unrecorded by the appropriate services, criminals to enjoy criminal money, but also to become more competitive on the market, created money laundering schemes and techniques. These two criminal phenomena manifest in parallel and intertwine in such a way that money from crime is placed in the legal financial system through corrupt activities, with the presentation of "fictitious income" of legal companies. For this purpose, companies where it is "difficult" to control income were used, and laundromats were selected, which is where the term "money laundering" came from. The crime of money laundering is the act of processing a large amount of illegal money resulting from criminal activities into funds that appear clean or legal according to the law, using sophisticated, creative, and complex methods. It is a process or an act that aims to hide or conceal the origin of money or funds, obtained from the proceeds of a crime, which are then transformed into funds that appear to originate from legitimate activities (Anggun, 2022).

Corruption and money laundering are also an economic category that is often the cause of an imbalance between supply and demand. Influence trading is driven by business interests, and there could not be a comprehensive reform step that can be taken without the support of the political and economic elite (Lažetić, 2021).

Corruption and money laundering in North Macedonia have a significant impact on general functioning with negative effects on economic development, the political situation, the rule of law, effective access to justice, and public institutions. Following the recommendations of international conventions, but also the reports of international institutions and bodies since the beginning of the new millennium, systemic measures and activities have been undertaken to improve national legislation and establish special institutions in the direction of harmonization of national legislation. It is widespread and deeply penetrated in all sectors and pores of society, so it is always among the first five biggest problems for citizens. More than 80 % of citizens point to the inefficiency of the judicial system in the fight against corruption, the desire for quick personal enrichment of those who come to power, and the lack of strict administrative control over corruption. The inefficiency and corruption of the judicial system are also noted in the so-called Priebe report from 2017(https://vistinomer.mk/izveshtajot-na-pribe-tezhi-od-argumenti), where a group of high-ranking experts refers to the "captivity" of the judiciary by a small number of judges in influential positions who abuse the judicial system to gain power and advance personal interests and the interests of the ruling elite (Trpkovski, 2020).

Corruption and money laundering are white collar crimes and also a major organized crime. Historically, the term money laundering originates from the mafia buying laundromats as a place to invest

1 svetlana.nikoloska@uklo.edu.mk

the proceeds of crime. The crime of money laundering is generally carried out through several stages, namely placement, layering, and integration.

Without money laundering, there would still be corruption, but bribes would have to be paid (and held) in cash or readily movable valuables such as gold, diamonds and art. Not all bribes received have to be laundered: some cash can be redistributed as 'grease' payments or simply spent. Corrupt public and corporate officials, as well as other criminals, often use laundering agents, relying on them to show discretion in handling funds – and to be uncooperative in any criminal investigations that might arise (Levi, 2001).

In order for most corrupt proceeds to be reused they must undergo the money laundering process. It is during this process that corruption and money laundering in most cases interact at some point and form what could be described as a family-like relationship. However, for the money laundering process to be completed, corruption is highly noticeable as a facilitative ingredient. It has been observed that in almost all cases involving significant corrupt practices across very large spectrum, the proceeds do usually undergo the money laundering process. Corruption instruments contain provisions on the link or interaction between corruption and money laundering. The relationship between corruption and money laundering tends to be very clear. Corrupt money is often laundered in order to be legitimised. The World Bank noted this close link and observed: "Corruption and money laundering are a related and self-reinforcing phenomenon. Corruption proceeds are disguised and laundered by corrupt officials to be able to spend or invest such proceeds (Ekwueme & Bagheri, 2013).

In the Moneyval Report from 2013, it was noted that all cases in North Macedonia the perpetrators of laundering money and the proceeds of crime were prosecuted for abuse of official position and authority or tax evasion. (Report, april, 2014)

According to the Transparency International Report for 2021 "high corruption" is becoming a common term in North Macedonia, but it is rarely defined in a way that clarifies the necessary judicial and legislative reforms. It has been noted that the international organizations of the Group of States against Corruption (GRECO) and the European Commission (EC), although anti-corruption legislation was passed that meets international standards, the country did not continue with the implementation and enforcement of the legislation, thus eroding the public trust in the rule of law, where powerful politicians enjoy impunity, laws tailored to private interests and interference in the judicial system (Report, 2021).

The research for the period 2014-2022 is conducted based on the data from the Report of Transparency International and from the annual report of the Public Prosecutor's Office since it is the prosecuting authority for these criminal acts that are prosecuted in the course of official duty, and those reports include the data from filed criminal reports from all state authorities that have police powers, by the Law on Criminal Procedure (Official Gazette of the RM, No. 150/10), but also the reports from other sources - inspection services, anti-corruption commission, etc. In the same way, the data for the cases that are handled by the parties to the Basic Public Prosecutor's Office for the prosecution of organized crime and corruption are also taken into consideration. Nine years were covered during which the data were collected, synthesized, and analyzed, according to which the data for the reported, accused, and convicted perpetrators for all criminal acts pursued in the course of official duty are presented, and the research is only related to corrupt criminal acts from groups of criminal acts against official duty and laundered money and other proceeds from a criminal offense.

A special criminal offense with elements of illegal enrichment of public officials is also incriminated, thus enabling the authorities to conduct financial investigations and provide evidence for illegally acquired property and its confiscation, which as a measure is introduced with the purpose of confis-

cation of criminal proceeds and property subject to money laundering, i.e. legalization of criminal proceeds. The list of corrupt crimes based on the status characteristics of the perpetrators and the area of enforcement has increased since 2007 when the Republic of Macedonia became a member of the United Nations Convention against Corruption (UNCAC) (https://www.stat.gov.mk/Dokumenti/MK.pdf). However, in 2023, in a non-transparent and quick procedure, amendments were made to the criminal offense "Abuse of official position and authority" (Official Gazette of the RSM, no.188/23).

CRIMINAL-LEGAL ASPECTS OF CORRUPTION AND MONEY LAUNDERING IN THE REPUBLIC OF NORTH MACEDONIA

Regarding corruption, since the adoption of the first Criminal Code in the Macedonian criminal legislation in 1996 (Official Gazette of the RM, No. 37/96), more corrupt crimes have been criminalized, which are mainly systematized in Chapter 30 of Crimes against official duty, and for the first time, a criminal offense with elements of money laundering was incriminated – "Laundering of money and other proceeds of crime", which includes criminal acts of legalization of criminal money originating from the illegal drug trade. With the goal of harmonization of national criminal legislation and acceptance of recommendations from international conventions and reports of international bodies, the list of corrupt criminal offenses is expanded to criminal offenses systematized in the other chapters of the Criminal Code. Several amendments and additions were made to the Criminal Code to define the status characteristics of the perpetrators, redefine criminal acts, introduce criminal liability for legal entities, and predict measures for confiscation of property (Official Gazette of the RM, No., 37/96, 19/04, 80/09, 114/09, 248/18).

A special criminal offense with elements of illegal enrichment of public officials is also incriminated, thus enabling the authorities to conduct financial investigations and provide evidence for illegally acquired property and its confiscation, which as a measure is introduced with the purpose of confiscation of criminal proceeds and property subject to money laundering, i.e. legalization of criminal proceeds. The list of corrupt crimes based on the status characteristics of the perpetrators and the area of enforcement has increased since 2007 when the Republic of Macedonia became a member of the United Nations Convention against Corruption (UNCAC) (*https://www.stat.gov.mk/Dokumenti/MK.pdf*). However, in 2023, in a non-transparent and quick procedure, amendments were made to the criminal offense "Abuse of official position or authority" (Official Gazette of the RNM no. 188/23).

Regarding the criminal offense of "Laundering of money and other proceeds of crime", according to the recommendations of the FATF, the Rapporteurs of GRECO and Manival have been brought to criminal responsibility for officials and responsible persons in financial institutions and for disrespecting official authorizations by failing to comply with the provisions of the Law on Prevention of Money Laundering and Terrorism Financing, with failure to take measures and actions to prevent the placement of suspicious money or suspicious transactions or giving away an official secret for a financial investigation prepared by the client, this also constitutes a crime within the group of corrupt crimes.

In September 2023, the Parliament of North Macedonia significantly undermined the judiciary by amending the criminal offense of "Abuse of official position and authority" (Official Gazette of the RM, No. 188/23). In a non-transparent, quick procedure, the responsibility of officials, responsible persons, and persons who perform work in the public interest will be abolished for acts that were carried out by using official positions, exceeding official powers, or failing to perform official duties when carrying out public procurement or damage to the budget, from public funds or other resources of the state. Because of this, the scientific and professional public emphasizes the dangers of the "le-

galization" of "high corruption", and in its report for 2023, Transparency International notes that the statute of limitations will be enabled on 200 alleged cases of corruption involving former high-level officials (Annual Report, 2023).

The research for the period 2014-2022 is carried out based on the data from the Report of Transparency International and from the annual report of the Public Prosecutor's Office, since it is the prosecuting authority for the criminal acts that are prosecuted in the course of official duty, and those reports include the data from filed criminal reports from all state authorities that have police powers, by the Law on Criminal Procedure (Official Gazette of the RM, no. 150/10), but also reports from other sources - inspection services, anti-corruption commission, etc. In the same way, the data for the cases that are handled by the parties to the Basic Public Prosecutor's Office for the prosecution of organized crime and corruption are also taken into consideration. Nine years were covered during which the data were collected, synthesized and analyzed, according to which the data for the reported, accused, and convicted perpetrators for all criminal acts pursued in the course of official duty are presented, and the research is only related to corrupt criminal acts from groups of criminal acts against official duty and laundering money and other proceeds from a criminal offense.

SITUATION OF CORRUPTION IN THE REPUBLIC OF NORTH MACEDONIA

Since 2001, the Republic of North Macedonia has been on the list of countries ranked according to the Corruption Perceptions Index. A total of 180 countries are on the list. The following table shows the data extracted from all annual reports of Transparency International Macedonia for the period 2014-2022 year. Our country had the best perception index with a ranking at the 64th place in 2014, and the worst ranking was in 2020 when it was ranked 111th with 35 points, in 2021 it improved and was ranked 87th with 39 points, and in 2022 it was at the 85th place with 40 points out of a total of 100. In 2023, it will be at the76th place with 42 points, which indicates a "slight" improvement of the situation, but according to the methodology of Transparency International, any score below 50 points is considered a failure in the fight against corruption, that is, that there is a high level of corruption in the country (Annual Report, 2023).

Table 1. *Corruption Perception Index for the North Macedonia 2014–2022*

Year	Ranking	Points	Research	BF (BTI)	EIU	FH	GI	VDP	WEF	WJP
2014	64	45	6	49	66	46	21	42	47	
2015	66	42	6	40	61	41	21	42	47	
2016	90	37	7	40	54	42	19	34	49	21
2017	107	35	6	41	20	47	35	24		43
2018	93	37	7	41	20	47	35	39	33	43
2019	106	35	7	41	20	47	35	28	32	42
2020	111	35	7	41	20	47	35	28	32	40
2021	87	39	7	45	37	47	35	30	35	41
2022	85	40	7	45	37	47	47	27	36	40

Source: Transparency International Macedonia

According to the ranking and points for North Macedonia, the lack of integrity and respect for the legal as well as the decline in democratic processes is shown, the year 2022 was marked by huge corruption scandals in the judiciary, especially because the candidates passed the judicial exam without fulfilling all the legally stipulated conditions required for applying for it and fulfilling all the criteria, even though the procedures for the dismissal of the previous and the election of the new head of the Public Prosecutor's Office for the prosecution of organized crime and corruption, as well as the resignation of the President of the Judicial Council, leave doubts about the consistent application of the newly adopted laws by the parties at the two institutions whose aim is to take care of the integrity of judicial bodies, which additionally reduced the trust of citizens in the judiciary to only 4 %.(Taseva, 2022).

Table 2. *Volume, Structure and Dynamics of Reported, Accused and Convicted Perpetrators Involved in Corrupt Criminal Offenses for the Period 2014–2022*

Year	Art 353			Art 357			Art 361			Other			Total		
	RP	AP	CP	RP	AP	CP	RP	AP	CP	RP	AP	CP	RP	AP	CP
2014	1378	256	210	14	12	15	44	18	12	/	/	/	1436	286	237
2015	1635	215	328	14	6	10	32	13	8	/	/	/	1681	234	346
2016	1584	154	172	19	11	11	38	11	14	/	/	/	1641	176	197
2017	1528	125	120	10	1	6	22	1	13	/	/	/	1560	127	139
2018	1094	160	122	17	7	13	28	4	21	/	/	/	1139	171	156
2019	1674	271	80	12	7	7	29	2	4	/	/	/	1715	280	91
2020	1298	140	144	4	5	6	25	5	2	/	/	/	1327	150	152
2021	1391	200	133	17	5	6	27	11	3	295	50	66	1730	266	208
2022	1221	151	95	23	9	2	27	11	9	286	46	49	1557	217	155
Total	12803	1672	1404	130	63	76	272	76	86	581	96	115	13786	1907	1681

In the research period from 2014 to 2022, a total of 13,786 offenders were reported for corrupt criminal offenses, of which 92.9 % or 12,803 offenders were charged with the criminal offense of "Abuse of official position and authority" – Art. 353. For "Receiving a bribe"– Art. 357, 130 offenses were committed or 0.9 %, 2 % or 272 were committed for "Falsifying an official document" under Art. 361 and 4.2 % or 581 offenses were committed for other corrupt criminal acts. Of the total number of offenders reported, 13.8 % were charged, and 88.1 % of them were convicted. Of the total number of applicants, only 12.2 % were convicted persons. This is a fairly low conviction rate for corrupt criminal offenses, and especially for "Abuse of official position and authority" under Art. 353, where the conviction rate is 11 %.

According to the dynamics of corrupt crimes, the largest number was reported in 2021, a total of 1730, of which 266 were accused and 208 were convicted. In 2018, the lowest number of total reported offenders was 1139, of which 15.01 % were charged, and of the total reported 13.7% were convicted. This is a higher conviction rate than the average for the researched period.

According to the structure and dynamics in the researched period, most of them are for the crime "Abuse of official position and authority" under Article 353, and the largest number of 1674 perpetrators were reported in 2019, and the smallest number was in 2018 with 1094 perpetrators.

Table 3. *Volume, Structure and Dynamics of Reported, Accused and Convicted Perpetrators of Corrupt Criminal Offenses for the Period 2021–2022*

Criminal Offences – Art.	2021			2022			Total		
	RP	AP	CP	RP	AP	CP	RP	AP	CP
Abuse of official position and authority - 353	1391	200	133	1221	151	95	2612	351	228
Negligent performance of duty - 353-v	186	20	20	199	21	16	385	41	36
Embezzlement in the duty - 354	9	2	3	24	6	10	33	8	13
Fraud in the duty - 355	4	/	/	7	1	/	11	1	/
Helping oneself in the duty - 356	3	1	3	1	1	2	4	2	5
Receiving a bribe - 357	17	5	6	23	9	2	36	14	8
Giving a bribe - 358	10	1	1	5	5	6	15	6	7
Giving a reward for unlawful influence - 358-a	/	/	/	1	/	/	1	/	/
Receiving a reward for unlawfully influence – 359	20	2	/	3	/	/	23	2	/
Unlawful acquisition and concealment of property - 359-a	2	3	2	5	/	3	7	3	5
Falsifying an officia document - 361	27	11	3	27	11	9	54	22	12
Others	61	21	32	41	12	12	102	33	44
Total	1730	266	203	1557	217	155	3287	483	358

The table shows the data on the corrupt crimes for which the Public Prosecutor's Office started conducting proceedings and on other crimes from Chapter 30 of Crimes against Official Duty. For most of them there were no proceedings in previous years, but again the most committed crime is "Abuse of official position and authority". It is to be welcomed that the public prosecutors "dared" to classify other crimes as well, especially those with elements of illegal remuneration and illegal acquisition of property. And in these two years, the degree of conviction is low and amounts to 11.7 %. That is quite a low percentage, but it is due to "corruption in the judiciary", or "secondary corruption", which is a long-standing problem.

An indicator of the low level of indictment, and especially the conviction of perpetrators for corrupt crimes, is the absence of responsibility of public prosecutors. Prosecutors are rarely held accountable for misconduct, even when their actions are proven to have contributed to wrongful convictions. There is public distrust in prosecutors working to prosecute organized crime and corruption, as well as widespread perceptions that the prosecution lacks integrity and is not immune to influence from politicians and business elites (*https://www.ihr.org.mk/storage/app/media/Publications/zaslepena-pravda-za-web.pdf*).

As indicators of "influence trading" on public prosecutors and contribution to their negligent work are the data that in the past years the Parlament of North Macedonia dismissed four state public prosecutors, and the special public prosecutor was also convicted of corruption. Regarding the degree of conviction of the officials for corrupt crimes through statistical analyses, only 19.1% of the criminally

reported officials were also convicted, which is emphasized in the reports of the European Commission on the progress of our country in the implementation of reforms, as well as the reports of Reinhard Pribe (Blinded justice: to a captured state in North Macedonia – judiciary, public prosecution and police, *https:// www.ihr.org.mk/storage/app/media/Publications/zaslepena-pravda-za-web.pdf*).

THE MONEY LAUNDERING SITUATION IN THE REPUBLIC OF NORTH MACEDONIA

For the first time, "Laundering of money and other illegal property gains" is provided as a criminal offense in Article 273 of the Criminal Code of 1996 (Official Gazette of the RM, No. 37/96), and in 2004 the title was changed to "Laundering of money and other proceeds of crime", (Official Gazette of the RM, No. 19/04), and certain additions were also made in 2009 (Official Gazette of the RM, No. 114/09) so that the specified criminal offense includes several criminal behaviours, including corruption in the process of money laundering by bank officials, which is also incriminated. It is about criminalizing criminal behaviour in the process of money laundering by officials, responsible persons, or persons performing work of public interest in entities that will enable or allow a transaction or business relationship, or will act contrary to their legal duty into a ban imposed by a competent authority or a temporary measure determined by a court or will not report the laundering of money, property or property benefit, which they learned about in the performance of their function or duty. Likewise, the same applies when they unauthorizedly disclose to a client or an uninvited person the data related to the procedure of examining suspicious transactions or the application of other measures and actions to prevent money laundering (Criminal Code, Official Gazette of the RM, No. 114/09).

The money laundering situation is continuously monitored and evaluated by the MONEYVAL Committee, so because of a two-year multi-stage evaluation process, the report on the RNM was considered and adopted at the 65th plenary session held in May 2023. The report presents a comprehensive assessment of the country's level of compliance with the international standards of the Financial Action Task Force (FATF), stating that, after the RNM strengthened its legal framework since the last evaluation and laid the foundations for a sound system to deal with laundering money and terrorist financing, there are still several areas where the state needs to improve its enforcement. This relates to the results of money laundering investigations and prosecutions, law enforcement and prosecutors should systematically conduct parallel financial investigations and target more complex cases of money laundering involving organized crime, especially drug trafficking, human trafficking as well as tax evasion and corruption. MONEYVAL also calls on the authorities to systematically apply the "follow the money" principle to improve confiscation levels (Moneyval, May 2023).

The criminal offense "Laundering money and other proceeds of crime" in criminal cases occurs as a secondary criminal offense for which it is expanded by opening an investigation by the public prosecutor's office, and the most common predicative is the corrupt criminal offense and that is "Abuse of official position and authority". In the Financial Intelligence Agency's 2020 Money Laundering and Terrorist Financing Risk Assessment Report, the crime listed is the first on the list of high-risk money laundering-related crimes (*https://ufr.gov.mk/wp-content/uploads/2020/05/NRA-Izvestaj-za-web-19-05.pdf*).

The research by collecting, synthesizing, and analyzing the data from the Annual Reports of the Public Prosecutor's Office of the NM for the period 2014-2022 is a little more complicated than the corrupt crimes for objective reasons. Namely, no separate criminal charges have been filed against the perpetrators for the specified crime, the "grounds of suspicion" are included in the predicate crimes, or, later during the investigation, an extension was made to money laundering, depending on the results of the

measures and actions taken or the monitoring on the "money flow" of predictive crime suspects. However, by applying the content analysis method, data on money laundering cases have been extracted and presented individually for each of the researched years. For the last two years of the investigated period, in the annual reports of the public prosecutor's office, the data on reported, accused, and convicted perpetrators for the crime of "Laundering money and other proceeds of crime" have been systematized and presented in a table.

For the crime of "Money laundering and other proceeds of crime" under Art. 273 according to the annual reports of the Public Prosecutor's Office (Annual reports from 2014-2020), the situation is as follows:

- In 2014, one criminal charge was received against one person, an investigation was opened for the same, and from the previous years, proceedings were conducted against 42 people or 43 in total, for all of them convictions were brought and confirmed by a second-instance court.
- In 2015, criminal charges were received against 21 people, of which 3 were rejected, 2 were not resolved, 4 were subject to additional investigations, 12 were investigated, of which an indictment was filed against 5, and 7 are in process.
- In 2016, 10 criminal charges were received, and 16 have been in process since 2015. Proceedings are in process against 26 people, of which 2 have been charged, there is a first instance judgment, after which the public prosecutor filed an appeal to a Court of Second Instance, three have been decided in some other manner, while for 21 people they are still in process.
- In 2017, the Basic Public Prosecutor's Office for Prosecution of Organized Crime and Corruption, after the completed investigation, filed an indictment against 6 persons, who are also being prosecuted for "Laundering money and other proceeds of crime" - Art. 273 and "Tax evasion" - Art. 279, as a predicative act, damages were calculated in the total amount of 24,212,222.00 denars, with which the Budget of the Republic of Macedonia was damaged.
- For the year 2018, no data have been recorded.
- In 2019, there are data on the confiscation from three persons for 223,225,015.00 denars and other items, for "Laundering money and other proceeds of crime", and the money and items originate from the illegal operation of gambling establishments.
- For the year 2020, in the Basic Public Prosecutor's Office for the Prosecution of Organized Crime and Corruption, a confiscation measure has been imposed against a total of three persons for crimes with elements of money laundering, and as predicates are the illegal drug trade and smuggling of migrants.
- For 2021 and 2022, a total of 69 persons have been registered, of which 17 are accused and 14 convicted, the percentage of the accused is 24.6%, and of the convicted it is 82.4%. The conviction rate concerning registration is 20.3%. The perpetrators are mostly suspected of predicative corruption crimes, but also of other crimes committed by organized criminal groups.

Table 4. *Volume, Structure and Dynamics of Reported, Accused and Convicted Perpetrators of "Laundering Money and Other Proceeds of Crime" – Art. 273 - for the Period 2021–2022*

Criminal Acts	2021			2022			Total		
	RP	AP	CP	RP	AP	CP	RP	AP	CP
Art. 273	29	13	3	40	4	11	69	17	14

In the research period 2014-2022, according to the method of analysis of reports, the data on confiscation of property originating from corruption and money laundering were collected and analyzed. Since the number of imposed measures, confiscation of property, is small from the reports of the Public Prosecutor's Office, the data have been extracted by year, type of crime and amount.

- In 2014, with the verdict on "Abuse of official position and authority" - Art. 353 p. 5 from the Criminal Code, 245,380.00 denars were confiscated from one person.
- In 2015, with the verdict on "Abuse of official position and authority" - Art. 353 p. 5 of the Criminal Code, 1,200,000.00 denars were confiscated from one person.
- In 2017, 39,627.50 euros were confiscated from one person in money laundering, and an indictment was initiated against six persons for three criminal acts: "Laundering money and other proceeds of crime", "Abuse of official position and authority" and "Tax evasion", while 24,212,222.00 denars were calculated and blocked, which damaged the Budget of the Republic of Macedonia.
- In 2018, with the verdict "Abuse of official position and authority under" Art. 353 of the Criminal Code, property worth 4,906,475.00 denars was confiscated from one person.
- In 2019, 223,225,015.00 denars were confiscated from three persons for the crime of "Laundering money and other proceeds of crime", originating from gambling crime.
- In 2020, a measure of confiscation was imposed against three persons for the crimes of "Laundering money and other proceeds of crime" originating from the predicate crimes of illicit drug trafficking and migrant smuggling, the amount is not specified.
- In 2021, a confiscation measure was imposed against four persons for laundering money and other proceeds of crime, narcotic drugs - marijuana and land worth 1,794,141.00 denars, on predicate crimes of illegal drug trade and migrant smuggling. Also, for the crime of "Laundering money and other proceeds of crime" from 97 persons a total was confiscated of 817,580.00 denars, 33,955.00 euros, dollars, Swiss francs, 47 motor vehicles, 11 trucks, two motorcycles, 120 mobile phones, two watches, computer equipment, 11 laptops, guns, GPS device, 279,413 gr of marijuana, and 2 kg of cocaine, as predicate crimes with elements of participation in a foreign military, human and minor trafficking, and migrant smuggling, committed by organized criminal groups.
- In 2022, with the verdict for "Abuse of official position and authority", the property benefit in the total amount of MKD 10,247,141.00 was confiscated for the benefit of the state. Also, the Basic Public Prosecutor's Office for Prosecution of Organized Crime and Corruption submitted six requests to the Basic Criminal Court Skopje for the determination of a temporary measure prohibiting the alienation and disposal of immovable property due to reasonable suspicion that the property originates from a criminal offense and that at the end of the criminal procedure its confiscation will be particularly difficult or impossible for two persons suspected of crimes of "Laundering money and other proceeds of a crime" and four person as perpetrators of the crime of "Abuse of official position and authority", whereby shares of legal and natural persons and securities are frozen. The three cases have been registered that refer to the request for temporary measures, the temporary freezing of financial assets for three persons and one legal entity due to the existence of grounds for suspicion of committed criminal acts of "Laundering money and other proceeds of a crime" and "Fraud", the property has a total value of 39,952,281 euros and refers to cash, construction land, apartments, business premises, hotel, securities, and shares.

According to the Transparency International Report published in 2024 for the period from 2016 to 2023, a total of 6 million euros were seized in 2016, in 2017 – half a million euros, in 2018 one and a

half million euros, in 2019 – 8 million euros, in 2020 year - 2 million euros, in 2021 - a million euros, in 2022 - 22 million euros and 2023 - 2 million euros (Report, 2023).

CONCLUSIONS

- "High corruption" is a serious problem, and the most commonly committed crime is "Abuse of official position and authority", where the perpetrators are persons with official duties and powers, and they act criminally for the acquisition of illegal property benefits to the detriment of the State Budget.
- In the first seven years of the research, three corrupt crimes were most often committed, while the list of prosecuted cases in the last two years (2021 and 2022) is increasing, but the problem of weak convictions is evident in all corrupt crimes.
- The low number of convictions points to the problem of corruption in the judiciary, which is a very serious problem that Priebe points out in his report, but also other researches indicate that the citizens' trust in the judiciary is quite low and that low trust is due to the "suspicion" of their corruption and conducting proceedings according to the principle of "selective justice".
- The connection between corruption and money laundering is also indicated by the data from the confiscation, where it is emphasized that the predicate crime of "Laundering money and other proceeds of crime" is "Abuse of official position and authority".
- About 200 procedures for "Abuse of official position and authority" in public procurement that are being conducted before the courts will be stopped due to the "quick", non-transparent amendment, due to which more suspected and accused officials and other officials and responsible persons will be "released" from responsibility in the procedures that have been started and were in progress against them.

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FINANCIAL INVESTIGATION OF ENVIRONMENTAL CRIMES IN NORTH MACEDONIA

Marina Malish Sazdovska, PhD[1]
Faculty of Security Skopje, University St. Kliment Ohridski – Bitola, North Macedonia

Marina Mitrevska, PhD
Institute for Security, Defence and Peace, Faculty of Philosophy
Ss. Cyril and Methodius University in Skopje, North Macedonia

PURPOSE

Environmental crime consists of punishable behaviors that endanger the environment and nature, and it consists of numerous incriminations provided in the Criminal Laws of the states. In the Republic of North Macedonia, environmental crime is provided in Chapter XXII of the Criminal Code. Numerous environmental crimes have been moved here, starting from the basic crime of Pollution of the environment and nature, where threats to all ecosystems are foreseen, up to illegal hunting, illegal fishing, devastation of forests, torture of animals, and many others. With the latest amendments to the Criminal Code, the crime of Ecocide is prescribed, which stipulates that "anyone who, contrary to the law, to cause damage to the environment, shall take an action or shall fail to take an action that will cause serious, widespread or long-term damage environment, will be punished with a prison sentence of at least ten years or with life imprisonment" (Criminal Code, Official Gazette of RSM, 2023)

To suppress environmental crime, it is necessary to apply a large number of measures and activities from the police toolkit to effectively detect, prove, and clarify criminal acts. These include operational-tactical measures and investigative actions within the criminal investigation. But also, in parallel with the criminal investigation, measures, and activities are applied within the framework of the financial investigation for this type of crime. The purpose of the paper is to analyze the criminal, especially the financial investigation, which is applied to effectively suppress this type of crime. (Malish Sazdovska, 2013)

Financial investigations are an important part of the criminal investigation, because very often, in addition to committing the basic nature of the crime, other criminal acts are also committed. Thus, for example, the crimes of abuse of official position, money laundering, falsification of documents, giving and receiving bribes, etc. are often committed in deforestation. Corruption represents a significant difficulty in discovering, proving, and clarifying environmental crimes because it is represented, among employees of institutions: the Ministry of Environment and Physical Planning, State Inspectorate for Environment, Forest Police, etc. (Malish Sazdovska, 2023)

To fully reveal the flow of money and benefits in the form of illegal material enrichment, an efficient financial investigation should be carried out. (Nikoloska, 2008)

1 marina.msazdovska@uklo.edu.mk

DESIGN/METHODS/APPROACH

Content analysis methods were applied during the preparation of this paper. The authors have analyzed a large number of documents, such as Annual Reports from the Financial Police Administration, Statistics from the Ministry of Internal Affairs, the Assessment of threats from organized and serious crime, and others. Also, a certain number of legal acts, laws, conventions, etc. have been analyzed, and the answers to requests for access to public information are an integral part of the paper. At the same time, it must be emphasized that the Ministry of Internal Affairs fully deals with access requests, while other institutions have a partial reply that does not contain the requested data.

FORENSIC INVESTIGATIONS OF ENVIRONMENTAL CRIMES

In the Republic of North Macedonia, there are several competent authorities for the combating environmental crimes. These are the Ministry of Interior, the Customs Administration, the Inspectorates, the Financial Intelligence Authority, the Financial Police Authority, etc. Within their competencies and powers, they apply measures and activities within the framework of the methodology of combating environmental crime in the country. The methodology consists of several parts, namely: ways to find out about committed crimes; criminal and financial investigation; situational and other types of expertise during the inspection of the scene; determining the identity of the perpetrators; providing material evidence; filing criminal reports, etc. (Malish Sazdovska, 2013)

Investigations at the international level involve the government officials of various countries and provide measures and activities according to the national legislation of individual countries, but it is understood that in cases of transnational organized crime, actions are also taken at the international level. The role of international organizations that have defined the policy of environmental protection in their goals is particularly significant, as is the case with Interpol. Through the exchange of data and information within the framework of the investigation of a case, it is possible to gather important knowledge about certain criminal behavior and with the action of competent authorized officials from several countries to realize the case with an effective conclusion of arrest and conviction of the persons involved in the case of environmental crime. (Malish Sazdovska, 2014)

FINANCIAL INVESTIGATIONS INTO ENVIRONMENTAL CRIMES

Within the framework of criminal investigations, it is necessary to conduct financial investigations to discover, prove, and clarify all types of crimes, including environmental crimes.

On the international level, there are recommendations for conducting financial investigations into environmental crimes. Thus, The Financial Action Task Force (FATF) – the global anti-money laundering watchdog – estimates that environmental crime is one of the most profitable criminal enterprises, generating around USD 110 to 281 billion in criminal gains each year; however, its latest suggests that less than 1 percent of the profits are recovered. Recommendations for improving this condition include:

- countries need to bring financial crime and anti-money laundering expertise into public - policy dialogue on environmental protection and climate change,

- develop and developing countries to address long-standing gaps in their AML frameworks and ensure that AMP experts' partner with a wider range of public and private sector partners to detect anomalies,
- the public has an important role to play in helping to ensure environmental crimes are treated seriously and that criminals are sanctioned. (Pereira Gonzalez & Hart, 2024)

In the Republic of North Macedonia, the criminal police in the Ministry of Internal Affairs is responsible ex officio for all criminal investigations for the criminal acts provided for in the Criminal Code. However, in the area of financial investigations, other competent authorities such as the Financial Police Authority and the Financial Intelligence Authority may be involved. Operational-tactical measures and activities and investigative actions are available to these institutions, with the application of which criminal and financial investigations can be carried out. A special focus in this paper is placed on environmental crimes, as a subject of interest of these state institutions in charge of crime suppression in the country.

THE MINISTRY OF INTERNAL AFFAIRS IN COMBATING ENVIRONMENTAL CRIMES

The Ministry of Internal Affairs, according to the positive legal regulations in the Republic of North Macedonia, is in charge of combating all types of crimes, including environmental crimes. Namely, within the ministry there are a large number of organizational units that deal with the suppression of a specific group of crimes, such as, for example, organized crime, blood and sexual offenses, juvenile delinquency, property offenses, etc., but there is no separate organizational unit within the ministry, which deals exclusively with environmental crimes. This represents a serious obstacle to the successful and efficient detection, proof, and clarification of environmental crimes in the Republic of North Macedonia. For a long period, the academic and expert public advocated for the establishment of such a department, to prevent the perpetrators from committing acts against the environment and nature.

However, within the organizational units for general and organized crime, some inspectors also carry out criminal investigations for environmental crimes. According to the records of the Ministry of Interior for the period 2020-2022, the following crimes were registered:

Table 1. *Registered Crimes and Perpetrators of Crimes Against the Environment and Nature*
(Source: Reply to A Request from the Ministry of Interior)

	Registered crimes and perpetrators of crimes against the environment and nature	2020		2021		2022	
		crimes	perpetrator	crimes	perpetrator	crimes	perpetrator
Article 218	Pollution of the environment and nature	3	1	3	6	1	1
Article 222	Transmission of infectious diseases in animal and plant life					1	1
Article 223	Contamination of feed or water						

Article 224	Destruction of plantations using harmful substances			3			
Article 225	Usurpation of real estate	39	42	72	87	82	100
Article 225-a	Illegal exploitation of mineral resources			7	8	2	8
Article 226	Devastation of forest	30	25	27	28	22	49
Article 227	Causing a forest fire	1	1	2	3		
Article 228	Illegal hunting	16	21	13	18	8	12
Article 228-a	Unauthorized hunting, keeping, and expropriation of wild animals and birds			2	2	2	6
Article 229	Illegal fishing	9	21	10	12	8	12
Article 230	Endangering the environment and nature with waste	7	7	10	8	37	53
Article 233	Animal torture	22	16	34	18	33	26
Total		127	134	183	190	196	268

Based on the statistical data from the Ministry of Interior, we can conclude that for a period of three years 2020-2022, there was a certain number of detected environmental crimes and filed criminal reports. For this period, there were a total of 506 criminal acts from Chapter XXII and 592 perpetrators. From the table it can be concluded that the most represented crime was a usurpation of real estate, then the devastation of forests, illegal hunting, illegal fishing, and torture of animals, other crimes are either little represented or no other crimes were detected.

About the ratio of the number of crimes to the number of perpetrators, it can be concluded that there is a smaller number of crimes, and a greater number of perpetrators, which points to a group classification of crimes. This conclusion applies to almost all environmental crimes under Chapter XXII, except for the crime of Animal Torture, which may indicate perpetrators who are multiple offenders.

The Ministry of Interior issues an annual report on its operations under the title Serious and Organized Crime Threat Assessment 2022, which includes the results related to illicit drug trafficking, smuggling of migrants, computer crime, illicit trafficking in arms, smuggling of excise goods, property crime, and cultural heritage, and from 2021, results regarding environmental crime will also be published. But the results published in the Assessment are not at a satisfactory level, because it is stated that:

- crime against the environment is a threat, with serious consequences in the medium and long term for the health and life of the citizens, as well as for the sustainable economic development of the country.

- criminal groups involved in illegal forest cutting have been identified, which in certain cases also use violence against officials.
- corruption has a strong connection with the execution of environmental and economic crime.
- there is a particularly low rate of detection of criminal acts, the competent authorities hardly recognize the criminal acts, and the authorized persons are legally limited or insufficiently materially technically and professionally trained. (Assessment, 2022)

These conclusions indicate that there are serious obstacles in carrying out criminal investigations for the combating environmental crimes in the country, which in the next period should be a priority for the competent authorities, to change the way of operation and increase the efficiency of investigations.

According to the Organized and Serious Crime Threat Assessment - Mid-Term Review 2023, it is stated that:

- Environmental crime is a current threat that is realized through the illegal use of natural resources, as well as the increasing threat to the environment and nature with waste. It can also be concluded that environmental crime is tightly intertwined with the legal business sector, with criminal structures abusing legal loopholes and legislative changes and using them for new criminal activity.
- In the Republic of North Macedonia, environmental crimes refer to the entire territory, but crimes most often occur by usurpation of real estate, endangering the environment with waste, etc.
- The detection function is assessed as low, which is due to the inefficiency of criminal investigations because there are still committed crimes that have not been prosecuted.
- In the reporting period, organized criminal groups were not discovered, but the possibility of organized action and cooperation with groups operating in the field of corruption and economic crime is assumed. (Assessment, 2023)

This periodic report presents data that indicate the presence of environmental crime in the country, its characteristics, scope, and dynamics, as well as the difficulties in its effective suppression.

THE FINANCIAL POLICE OFFICE

The purpose of the work of the Financial Police Office (hereinafter referred to as the Financial Police) is to protect the financial interests of the Republic of North Macedonia through the detection and criminal investigation of the crimes of money laundering and other proceeds of crime, illicit trade, smuggling, tax evasion, as well as other crimes involving unlawful property gain of considerable value. In that way, the protection of the financial interests of the European Union is ensured through the detection and criminal investigation of crimes related to the use of funds from the programs of the European Union, which the Republic of North Macedonia receives from the budget of the European Union.

During its operations, the Financial Police should respect the following principles: legality, proportionality, efficiency, and impartiality.

When conducting investigations, the Financial Police has the authority to:

- detect and conduct a criminal investigation of crimes that are prosecuted ex officio such as money laundering and other proceeds, illicit trade, smuggling, tax evasion, and other crimes with illegal property benefits of significant value, as well as to capture and report their perpetrators, provide evidence, other measures and activities that they can use for the smooth conduct of the criminal

proceedings ex officio or by order of the public prosecutor through the execution of the powers of the judicial police by the law;
- collect and analyze data on cash transactions, undertake pre-investigation and other measures when there are grounds for suspicion of committed criminal acts, follow the trail of money to detect criminal acts established by law, conduct inspection and review of accounting data and record in computer systems in the presence of a responsible person or a person authorized by them and perform other tasks by the law;
- perform forensic computer analysis of temporarily confiscated computer systems and other electronic devices;
- submit criminal reports to the competent public prosecutor for crimes within its jurisdiction, which are prosecuted ex officio;
- submit an initiative to initiate a tax and other procedure for the determination and collection of public duties before the competent authority;
- perform other tasks established by law.

Employees of the Financial Police have at their disposal certain powers that refer to: checking the identity of persons; summoning citizens and collecting information; apprehension; deprivation of liberty; retention; diverting, directing, or restricting the movement of people and means of transport in a certain space for the necessary time; temporary confiscation of objects; inspection and review of business books and other documentation; covert police action; braking, inspection of persons, baggage and means of transport; collection, processing, analysis, use, evaluation, transmission, storage and deletion of data; providing handwriting and signature samples; use of technical equipment and application of special investigative measures and hidden sources of data by the Law on Criminal Procedure. Financial police officers are authorized to carry weapons and other means of coercion and can also apply special investigative measures and covert sources of data by the Law on Criminal Procedure.

After the successful completion of the investigation, the Financial Police submits a criminal report to the competent public prosecutor in which it states the evidence. Documentation, items, sketches, photographs, obtained reports, minutes, official notes, statements, and other evidence are submitted to the criminal reports.

To analyze the work of the Financial Police, the reports of the Administration, published on their website, were analyzed. Electronic reports Statistics and analysis by year, from 2004 to 2021, are published on the website. Weaknesses in the analysis of the presentation of data on criminal acts include the existence of a detailed explanation of the conditions of the commission of the crime. Namely, data is presented on crimes committed Tax evasion, Falsification or destruction of business books, Money laundering and other proceeds from a criminal offense, Abuse of official position, Fraud, Damage or privilege of creditors, Abuse of powers in economy and others, but no information is given about the nature of the crime, whether it is in the field of environmental crime or other.

However, some specific data can be noted about the criminal acts contained in Chapter XXII of the Criminal Code of the Republic of North Macedonia, which refer to the protection of the environment and nature. Thus, it is established that in 2021 a criminal report was filed for 1 crime of usurpation of real estate and 1 crime of illegal exploitation of mineral resources. So, for the period 2004-2021, criminal reports were filed for only two acts of environmental crime, and no correlation can be made for other criminal reports.

CASE STUDIES

1. The FP filed a criminal report against three natural persons and one legal entity, due to the existence of a well-founded suspicion of the crimes of fraud and falsification of documents for damages in the total amount of 214,411,861 denars. (3428998 euros)

To obtain an illegal property benefit by falsely presenting facts, the perpetrators misled the damaged legal entity into unjustifiably paying a significant amount of money based on the purchase of old batteries, while using false forms for the waste of old batteries.

In this case, a crime was committed about waste, which indirectly endangered the environment and nature. With the implementation of financial investigations, criminal behaviors related to waste, dangerous substances, medical waste, etc. were revealed. This is a positive example of discovering, proving, and clarifying a crime related to financial transactions of objects and materials that should be deposited adequately, otherwise, the environment is endangered.

2. The Financial Police Office filed a criminal report against a natural person in the capacity of an official – a senior civil servant at the Ministry of Environment and Spatial Planning of the Republic of North Macedonia, due to the existence of a well-founded suspicion of using their official position in 2021 who acted contrary to the Law on the Environment, in such a way that without inspecting the installation and its operation to determine the fulfillment of the requirements according to the legal regulations, they prepared and approved an A-integrated environmental permit of Public Enterprise for Waste – Drisla Skopje, even though they did not possess appropriate equipment and installations for receiving and treating 22 codes of hazardous waste from the 36 specified in the issued permit. In 2021, 16,900 kilograms of hazardous waste from several legal entities were received and treated at Public Enterprise for Waste – Drisla Skopje, with which the defendant committed the crime of pollution of the environment and nature, and the legal entity acquired a property benefit for 455,368 denars, 7,282.5 euros

With the realization of this investigation and the submission of the criminal report, the responsibility of an official who abuses their official position and thereby commits the crime of pollution of the environment and nature is determined. This crime is a basic environmental crime because it refers to the pollution of all ecosystems of water, soil, and air, and it can be committed by both natural and legal persons.

3. The Financial Police filed a criminal report against a natural person in the capacity of responsible person and owner of the legal entity due to the existence of a well-founded suspicion of a committed crime: Illegal exploitation of mineral resources. The perpetrators, taking advantage of the same permanent relationship and the same occasions, in the period between January 01, 2017 and December 31, 2020 carried out illegal exploitation of mineral resources – mineral water defined by law, exploited the sources of mineral water, filled the water in bottles and put it in circulation, with which they acquired an illegal property benefit from the sale of bottled water for MKD 28,659,312.00. (458,336 euros)

With the realization of the investigation into this crime, it was determined that for a longer period than four years, the perpetrators carried out illegal exploitation of mineral water and acquired a significant amount of illegal material property benefit.

From the above examples we can conclude that, in addition to other competent authorities, the Financial Police undertakes specific measures and activities to realize criminal, that is, financial investigations to discover, prove, and clarify environmental crimes. Although the focus of their work is not this group

of crimes, it can be noted from their actions in the field that, although in small numbers, there are also environmental crimes from Chapter XXII of the Criminal Code, which are the subject of their action.

THE DIRECTORATE FOR FINANCIAL INTELLIGENCE IN THE COMBATING OF ENVIRONMENTAL CRIMES

The Directorate for Financial Intelligence (hereinafter referred to as the DFI) has been operating since March 2002 as an authority within the Ministry of Finance. The Administration has been a member of the EGMONT Group since 2004 and is an equal partner of the Financial Intelligence Units from around the world. The information that it possesses, which is of interest to other countries, is delivered in a timely and protected manner, and it requests information that is of interest. International and regional cooperation, the mutual exchange of data, and the exchange of experiences in the field of prevention and detection are an important factor for the construction and establishment of an efficient and functional national system for the prevention of money laundering and the financing of terrorism.

The administration functions as a financial intelligence unit, with the basic competence to collect, process, and deliver data to prevent money laundering and terrorist financing. It is necessary to implement a series of comprehensive measures that should contribute to the most efficient implementation of the obligation to recognize attempts at money laundering and terrorist financing.

After collecting the data received from the responsible entities or state bodies, the DFI processes them, supplements them with data and information from other sources, from the country and abroad, and analyzes and submits the results of its analyses in the form of a report or notification. to the Ministry of Internal Affairs, the Financial Police Administration, and/or the Public Prosecutor's Office. Also, the DFI supervises the application of measures and actions for the prevention of money laundering and financing of terrorism over all subjects, independently or in coordination with the supervisory authorities.

The new Law on Prevention of Money Laundering and Financing of Terrorism establishes to a certain extent the regulation of the crypto sphere from the aspect of the risks of money laundering and financing of terrorism. Also, the law establishes obligations for service providers related to virtual assets to prevent money laundering and terrorist financing, control mechanisms in case of potential abuses of virtual or crypto-assets, and trading of virtual assets with up to 500-euro cash in Denar value by the strategies to reduce the gray economy. In addition, the previous law prohibits service providers from trading fully anonymous virtual assets known as privacy coins, as well as from using software tools to anonymize and interfere with transactions with virtual assets.

This law also provides for the measures and actions to detect and prevent money laundering and financing of terrorism, which are undertaken by the following entities:

- drawing up an assessment of the risk of money laundering and terrorist financing and its regular updating,
- introduction and application of programs for efficient reduction and management of the identified risk of money laundering and financing of terrorism,
- customer analysis,
- notification and submission of data, information, and documentation to the Administration by the provisions of this law and the by-laws adopted on its basis,
- storing, protecting, and keeping records of data,

- appointment of an authorized person and his deputy and/or establishment of a department for the prevention of money laundering and financing of terrorism,
- implementation of internal control and
- other measures resulting from the provisions of this law.

The law defines entities that must submit reports on suspicious transactions (hereinafter – STR) to the Administration when they suspect or have grounds for suspicion that money laundering and/or financing of terrorism has been or has been carried out or an attempt has been made or attempts to launder money and/or to finance terrorism regardless of the amount of the transaction, when the property is the proceeds of a criminal offense or when the property is related to the financing of a terrorist act, a terrorist organization or a terrorist or a person who finances terrorism or weapons financing for mass destruction. DFI publishes annual reports on operations, so, during 2023, the subjects submitted a total of 191 STRs and 71 additions to STRs to the Administration, of which 188 STRs were submitted with suspicion of money laundering and 3 STRs with suspicion of terrorist financing. However, in the annual reports of the administration, it is not stated from which type of crime money laundering and terrorist financing are committed, and therefore we cannot present conclusions, on whether and how much income can result from environmental crimes in the country.

FINDINGS

The paper finds that criminal investigations for the suppression of environmental crime are undertaken to a certain extent, mostly by the Ministry of Internal Affairs, which, although it does not have a special organizational unit to fight this type of crime, nevertheless undertakes certain measures and activities in the field. However, as regards the financial investigations, it can be stated that they are not represented to a sufficient extent for the suppression of environmental crimes in the country. A problem for monitoring this problem is the way of keeping statistical records of individual institutions, which cannot be used to obtain precise data, for example: from which criminal offenses were provided illegally acquired material assets that are subject to money laundering.

CONCLUSIONS

Environmental crime is a threat to the environment and nature. That is why it is necessary to suppress it, by all competent authorities.

A special department should be established in the Ministry of Internal Affairs, which will deal exclusively with the detection and investigation of environmental crimes. At the same time, operational activity in the field should be strengthened, as well as raising the quality of submitted criminal charges. The investigative function of the Financial Police Authority and the Directorate for Financial Intelligence should also be increased.

In addition to criminal investigations, it is necessary to conduct financial investigations for this type of crime. Environmental crimes should also be covered by financial investigations, especially in cases where they are related to other crimes such as falsification of documents, money laundering, etc.

A special problem is the way of keeping statistics, where there is no precise data on financial investigations into environmental crimes.

Additional inter-institutional cooperation is also needed, with joint activities and data exchange for more effective criminal investigations into environmental crime.

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THE AGE RULES OF CRIMINAL DISCRETION IN HUNGARIAN AND INTERNATIONAL CRIMINAL PROCEDURE: ARGUMENTS AND COUNTERARGUMENTS IN FAVOR OF EVER-DECREASING AGE LIMITS

Vince Vári, PhD[1]
Bianka Bodó
Faculty of Law Sciences, Ludovika University of Public Service, Budapest, Hungary

INTRODUCTION

Throughout history, juveniles have held a significant position in the criminal justice system and various other aspects of life. This is not a coincidence, as this age group, which will eventually become full-fledged citizens, can shape the nation's progress through their lifestyle choices and the education they pass on to their children.

It is in society's best interest to guide juveniles towards a law-abiding lifestyle. Therefore, focusing on this age group is crucial, as a preventive approach can potentially reduce their future inclination toward criminal activities. This is where criminal law and criminal procedure law come into play.

Discernment should be assessed for child offenders aged 12-14. For certain offenses, if a child has the insight to recognize the consequences of the offense, it is not a disqualifying circumstance. In today's modern living conditions, the distinction between ages has become blurred, and the number of child offenders (12-14 years old) has increased within a few years (Lakner, 2023). There is an increasing need to test the capacity to discern in criminal proceedings.

The age of criminal responsibility has always been pivotal in the evolution of criminal law. Legislators have presented diverse perspectives on this matter. To formulate an optimal regulation that garners majority acceptance, it is crucial to thoroughly understand the criminological circumstances and aspects of the various age groups—these insights aid in comprehending different generations' characteristics and values and determining the most suitable criminal sanctions. The criminological analysis of the current situation of the age groups is particularly significant in the context of the young generation's role in the contemporary era.

Adolescence is a crucial period in life cycles and is the transition period between childhood and adulthood, characterized by biological and psychological changes. Children develop their own identities during this period of conflict and crisis, which starts at the age of 10-12 and lasts until around 18-20 (Csemáné, 2016). This period is also crucial for delinquency, as the link between age and delinquency can be demonstrated regardless of age or culture. Therefore, the analysis of juvenile delinquency is a constant feature of criminological research. It is not enough to examine the possible causes from a criminological point of view alone; the type of offenses they commit, their frequency, their geograph-

1 Vari.Vince@uni-nke.hu

ical distribution, and the age and gender distribution of the perpetrators must also be examined. This is a complex and multifaceted problem with many possible responses.

The science of criminology has developed several theories over time. Classical criminological theories can be grouped according to several aspects: whether they attribute the causes of crime to psychological or sociological causes and whether they are attributed to micro or macro-level processes (Balogh, 2020). The oldest theories, i.e., classical theories, can be grouped according to whether the causes of crime are sociological or psychological and whether macro or micro-level processes determine them. According to Robert K. Merton's theory, not everyone has the opportunity to achieve society's culturally determined goals, causing tensions that individuals resolve by implementing different adaptation strategies, depending on the legitimacy of the goals and the means chosen to achieve them (Merton, 1980).

Clifford Shaw and Henry McKay theorize that criminality is related to the area's economic, social, and cultural conditions. Their 1929 study examined nearly 60,000 juvenile males registered with the police and had court records for truancy or unlawful activity. Shaw and his colleagues found that crime was not related to ancestry but was due to poor social control (Shaw – McKay, 1942). They saw evidence for the thesis that crime is an acquired behaviour passed on through social relationships, passed from generation to generation, a phenomenon they termed cultural transmission. This ecological approach to criminology is known as the Chicago School.

The causes of juvenile delinquency can be attributed to subjective and objective factors, the correlations of which can offer a solution to this complex issue. Objective causes include the juvenile's social environment, personal relationships (mainly family and friends), economic, political, and living conditions in the country, and the impact of modern societal changes. Subjective reasons refer to the juvenile's personality, mental and physical state, and interests.

When it comes to international regulations, the criminological conditions are interpreted similarly. A survey by the European Council found that child poverty, increasing income disparities, rising divorce rates and family breakdowns, drug abuse, diminishing employment opportunities, escalating unemployment, and social and economic issues are significant causal factors contributing to child and juvenile crime (Ligeti, 2006, 25.). As a child's development in the early stages of life is influenced primarily by the family and later by the education system, the state should aim to create a legislative framework and institutional system that enables individuals who interact with the child at various developmental stages to understand the child's essential problems and risk factors and effectively manage them while ensuring the child's development in the right direction (Tóth, 2017.33.).

METHODOLOGY

Understanding the rules related to the criminalization of juveniles is challenging. Therefore, examining only Hungarian conditions is inadequate. Analysing and interpreting international provisions, rules, norms, guidelines, and statistics helps identify crucial legal policy or technical issues that must be addressed to advance criminal justice systems. For a study presenting the national legal framework, it is crucial to examine the background of the current legal regulation by conducting a legal analysis on the specific topic. This required analysing Hungarian criminal law regulations for juveniles and examining discretion methods regarding legal concepts, age limits, and sanctions nationally and internationally. Finally, we delved into the Serbian legal environment, focusing on current cases in Serbia. The research conclusions and findings were summarized based on the formulated hypotheses.

During the research, we formulated the following working hypotheses:

- Is lowering the age of criminal responsibility an appropriate response to current crime trends and addressing juvenile crime?
- Does juvenile delinquency present an unprecedented challenge for individual societies, and do the national, international, and EU legislations adequately respond by developing comprehensive and unified regulatory doctrines?

DEVELOPMENT OF THE NUMBER OF JUVENILE OFFENDERS

All media and press organizations are vocal about the fact that the number of crimes committed by children is constantly increasing, creating the impression and scaring the public that criminals are already lurking in kindergartens. "Based on the available statistical data, the number of juvenile offenders increased significantly in one year." (Lakner, 2023)

Based on the registered data in the records of the Hungarian Central Statistical Office, it can be established that in 2022, compared to the data of one year earlier (2021), the number of juvenile offenders under 14 increased by 589. This represents an increase of approximately 33%, which primarily applies to 13-year-old offenders. This increase is considered significant compared to the previous years, from 2018 to 2021, when there was only an increase, or even a decrease, of the order of ten (Central Statistical Office (From now: CSO), 11.1.1.4.). The table below clearly shows the mentioned increase.

Table 1. *Own Elaboration (URL1)*

Designation	**Requirements**				
	2018. II. semester	2019	2020	2021	2022
Child offender (under 14)	300	1 826	1 734	1 763	2 352
Juvenile offender (14-17 years old)	3 697	7 863	8 064	7 666	7 942
Young adult offender (18-24 years old)	10 612	24 497	23 989	26 078	27 098
Adult offender (25 years old and older)	43 520	102 475	105 151	111 168	106 572
In total	58 130	136 669	138 950	138 950	143 979
Requirement per 100 thousand inhabitants aged 14 and over		1 618	1 648	1 747	1 719

However, if we examine the social proportion of juveniles, a decrease can still be observed. According to the latest surveys, the aging index is 140.2%.[2] So, what led to the increase in the number of juvenile offenders?

Before trying to find an answer to this question, it is worth mentioning that latency, the principle of remaining hidden, prevails, especially in the case of children.[3] Adults forgive children many things; if they commit a minor crime or even a misdemeanour theft, in order to avoid later legal consequences, they forgo the opportunities provided by the criminal justice system. Only reprimands and scolding are used for the child's sake, so the act does not reach the authorities and, therefore, is not included in the statistical data.

2 The population aged 65 and over as a percentage of the child population aged 14 and under. If it is greater than 100, the elderly population exceeds the child population. (Source: https://www.ksh.hu/fiatalok-es-idosek)

3 Formally, hidden crime can be described simply: the totality of those criminal behaviors that do not come to the attention of law enforcement agencies, so they do not appear in official statistics either (Schwind, 2016, 41.).

There are several possible causes behind the increase in juvenile offenders. *"On the one hand, children's biological development has accelerated; children are maturing earlier, and due to the information revolution, they are affected by social influences sooner."* (Ministerial Justification related to § 16 of Act C of 2012 on the Criminal Code.) As a result, the first crime is committed earlier and earlier (Balogh, 2006, 107.). These circumstances may make it necessary to rethink the age limits of criminal liability since the boundaries between age groups are beginning to blur, and the examination of the ability to judge becomes much more critical.

The information revolution, especially the proliferation of cameras, also affects the evolution of latency. For example, in shoplifting, nowadays, it is more difficult to "cover up" a theft committed by a child or juvenile since camera footage is available and can be used as evidence.

Table 2. *Own Elaboration (URL2)*

Designation	**Offenders**		
	2020	2021	2022
Child offender (under 14) - minor assault	128	126	172
Juvenile offender (14-17 years old) - minor assault	595	525	563
Child offender (under 14) - aggravated assault	87	70	92
Juvenile offender (14-17 years old) - aggravated assault	402	371	3 944
Child offender (under 14) - assault causing death	0	0	0
Juvenile offender (14-17 years old) - assault causing death	1	1	1

The news that the number of violent crimes among young people has also increased is spreading more and more in the media. This impact was highlighted mainly in connection with the events in Serbia, which will be discussed separately.

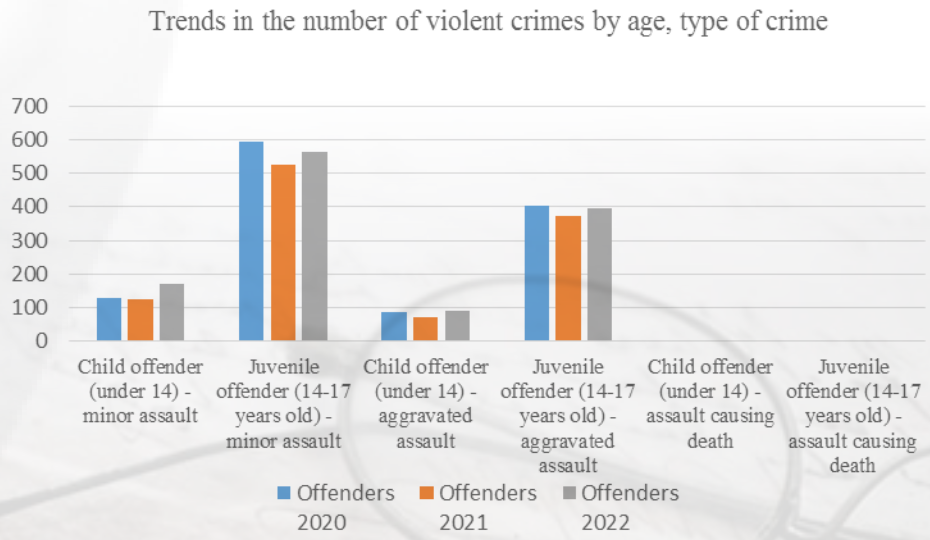


Figure 1. *Own Elaboration (URL1)*

However, if we observe Figure 1, we can conclude that the increase is only noticeable compared to the previous year's decrease, but no significant increase can be detected in the last three years. The more

significant, although slight increase can be explained by the development of latency and the increase in juvenile offenders, measured in general, as mentioned above.

We can conclude that in most cases juveniles continue to commit crimes against property. Therefore, the objective effect of deteriorating living conditions, unemployment, and poverty on young people is increasingly felt and can be demonstrated by statistical data.

INTERNATIONAL LEGAL REGULATIONS REGARDING THE AGE OF CRIMINAL LIABILITY

It is also necessary to examine international conditions to get a complete picture of the circumstances surrounding the correct establishment of the Hungarian criminal age limit and capacity for judgment. Looking at this issue from a different perspective, we can answer whether the Hungarian regulation is appropriate, that is, whether it meets international expectations regarding its purpose and values.

Presentation of the Two Trends

The European Union and other international organizations also establish main guidelines and goals, which the member states must apply as widely as possible. However, these principles are only partially binding, and it is up to the member states to develop specific regulations.

Thus, two trends may have emerged in Europe regarding the participation of juveniles in criminal proceedings: the education model and the justice model.

The educational model focuses on the child's personality and subjective circumstances. So, the main criterion is not the weight of the committed act but the perpetrator's person. Thus, sentencing aims to educate, improve, and rehabilitate the juvenile. The examination of insight is also given great emphasis. Sanctions are significantly lighter than those for adults and are usually imposed by a special juvenile court. In the case of such countries, separate juvenile codes are also typical. Today, only some countries follow this principle, as problems have arisen due to its cost, arbitrariness, and being a less efficient way. However, Greece and Belgium still follow this approach (Gyurkó, 2008, 78.).

The justice model, on the other hand, does not consider the perpetrator's personality; it focuses on the crime committed and its gravity. The purpose of sentencing is not to educate but to reintegrate the juvenile into society, thus preventing future crimes. The sanctions are proportional to the seriousness of the act, but they are different from those for adults. This model is followed, for example, by England, Wales and the Netherlands.

Nowadays, however, the boundaries of these principles have become blurred in more and more countries, and approaches are mixed. "We find a mixture of different trends, schools, and models with restorative, social, and therapeutic ideas, which points in the direction of a kind of 'balanced justice' model." For example, these mixtures can be observed in Hungary's current regulations (Csemáné, 2010, 10.).

As a result of the recently started modernization, juveniles and the crimes they commit are increasingly coming to the fore. With the guidance of EU directives, countries are developing their legal systems in a preventive approach, taking into account the personal characteristics of the offenders. It is, therefore, worth examining the evolution of the age of criminal liability and the ability to judge in different countries since these changes in attitude greatly influenced the necessity of their change.

Lowering the age limit plays a significant role in which of the two trends described above the given country prefers. The fact that several countries have decided to lower the age limit shows that the judicial model is increasingly coming to the fore. Just as in our country, the influence of the increasingly powerful media in highlighting the crimes committed by juveniles can be observed at the international level, thereby putting society's pressure on penal policy. Therefore, a lower age limit than the Hungarian regulation can be observed, especially among the followers of the judicial system.

Table 3. *Age Limits in Europe for Civil Legal Majority, Criminal Prosecution, and Application of Criminal Law Rules for Adults, (Deák, 2015)*

Countries	Age of criminal responsibility	Age from which adult criminal law applies	Civil law age of majority
England/Wales	10/12/15	18/21	18
Austria	14	18	18
Belgium	16/18	16/18	18
Bulgaria	14	18	18
Cyprus	10/14	16	16/18
Czech Republic	15	18	18
Denmark	15	15/18/21	18
Estonia	14	18	18
Northern Ireland	10	17/18	18
Finland	15	15/18	18
France	10/13	18	18
Greece	8/13	18/21	18
Croatia	14/16	18/21	18
Netherlands	12	16/18/21	18
Ireland	7/15	18	18
Latvia	14	18	18
Lithuania	14/16	14/16/18/21	18
Poland	13	15/17/18	18
Hungary	12/14	18	18
Montenegro	14/16	18/21	18
Germany	12/14	18/21	18
Norway	15	18	18
Italy	14	18/21	18
Russia	14/16	14/16	18
Portugal	12/16	16/21	18
Romania	14/16	18	18
Sweden	15	15/18/21	18
Switzerland	10/15	18	18
Scotland	8/16	16/21	18
Spain	14	18/21	18
Slovakia	15	18	18
Slovenia	14/16	18	18
Serbia	14/16	18/21	18
Turkey	12	18	18

When examining Table 3, it can be concluded that most European countries agree on the definition of the civil legal age for the majority. However, this does not mean that all countries apply the provisions concerning minors only up to this age. In many cases, for example, in England, Denmark, or even Spain, some juvenile provisions apply up to the age of twenty-one.

In the case of lower age limit regulation, it can be observed that the age limit in Anglo-Saxon countries is lower than in continental legal systems (Deák, 2015, 16.). The so-called common law legal systems can more freely interpret the age restriction by applying case law. Thus, for example, according to the Children and Personal Act adopted in 1963, England's minimum age of criminality is currently ten years (Children and Young Persons Act. 1963). This data may seem low compared to Hungarian regulations, but we can find even lower ones. Based on the table, it can be analysed that while in the case of Scotland and Greece, it is eight years, in the case of Ireland, which is considered the lowest, only seven years is the lower limit of criminal liability (Criminal Justice Act of Ireland (2006) Part 12. 129-130).

However, in Anglo-Saxon countries with a low age limit, the principle of justice different from that of adults also applies. The juvenile court conducts proceedings related to children and juveniles. It is also typical that a particular procedure applies to juveniles, with the involvement of child protection institutions and the possibility of implementing alternative options and educational measures (Igaz-Kenese, 2015.11.). Of course, in the case of these countries, the examination of discretion is also considered. In Ireland, for example, the law recognizes a mediation institution (Conference), within which they try to uncover the reasons behind the child's behaviour and draw up an action plan accordingly.

Based on the table, it can be said that most European countries apply the age of fourteen as the minimum age of criminal liability. They try to comply with international expectations, and the ability to discern is generally valid even in the case of regulations under this age, and countries with a low age limit typically apply the provisions concerning juveniles separately within the framework of a special court or procedure.

United Nations Organization

The United Nations (UN) is an international organization founded in 1945 by 51 countries committed to maintaining international peace and security, developing friendly relations between nations, social development, and a better standard of living and human rights in addition to promoting rights (URL1). One of the main goals of the United Nations is to encourage respect for each other's rights and fundamental freedoms, especially for children.

The UN has issued several documents and guidelines on this topic, which is called "child-cantered justice" (Vári – Magyari, 2015, 11). This means that child-cantered justice covers not only the rights of child victims but also the rights of perpetrators. The issued documents contain uniform recommendations stipulating that the interests and personal circumstances of children and juveniles who come into contact with the justice system are the most important.

An example is UN General Assembly Resolution 40/33, the Beijing Rules (hereinafter: Beijing Rules). It was the first document to state that the primary goal in the case of juvenile offenders is prevention. The decision did not specify the age limit for criminality, which the member states should follow. On the contrary, it says that *"the lower age limit should not be set too low and emotional, mental and intellectual maturity should be taken into account."* (Beijing Rules, Article 4.) So, this document can also emphasize the ever-increasing importance of discernment. It can be seen that already in the resolution of the General Assembly dated November 29, 1985, it was expressed that an essential task of the child

rights regulation is not the setting of the age of criminality, but the personal circumstances, one could say the subjective criminogenic circumstances. After all, it is known that childhood is characterized by emotional vulnerability, a desire to adapt to the person to whom the child is attached or wants to be attached. This desire to be connected and comply primarily determines the child's behaviour. Therefore, the child cannot be expected to act according to his discretion even if it is otherwise complete (Constitutional Court Decision 25/2022 (X.26).

The Beijing decision also states that "the economic, social, political, cultural and legal features of the given member state must also be considered" when determining the age limit. Therefore, the objective criminogenic conditions and the living conditions surrounding the juvenile should also be investigated and considered based on this document. The Beijing Rules contain applicable guidelines for member states to gradually incorporate these principles into their legal systems.

The Beijing Rules were followed by the 1990 Havana Rules, which contain principles for the conduct of juvenile detention. The subsequent Riyadh Guidelines contain guidelines on juvenile crime prevention, and the Tokyo Rules contain guidelines on non-custodial sanctions (Deák, 2015. 22.).

Finally, the UN General Assembly adopted the Convention on the Rights of the Child (hereinafter: Convention) in 1989. This Convention is vital because Hungary has enshrined it in law, so it has binding force. Like the Beijing Rules, it contains the paramount rights of children, specifying *that "States parties to the Convention shall make every effort to promote the adoption of special laws and procedures, the establishment of authorities and institutions for children suspected of, accused of or convicted of a crime and in particular, establish a minimum age below which the presumption of committing a crime against the child is excluded*" (Article 40, point 3 of the Convention). In addition, it does not formulate specific criminal age limits. However, it defines the concept of childhood, according to which: "*a child is a person who has not reached the age of 18"* (Article 1 of the Convention).

Other documents protect children and juveniles in addition to the ones listed, which is of great importance because member states can use them to shape their legal systems and develop their provisions for the protection of children's rights. Although these rules generally do not contain exact age limit definitions, they try to emphasize that countries do not set the age of criminality too low. They also agree on the importance of examining the ability to discern since they emphasize examining the personal circumstances of the juvenile.

European Union

In addition to the United Nations, the European Union has issued guidelines and rules for minors. We would highlight an essential Directive 2016/800 of the European Parliament and Council (EU) on procedural safeguards for children suspected or accused during criminal proceedings (hereinafter: Directive). This Directive is significant because it contains a schedule that had to be implemented in the legal provisions of the Member States by June 11, 2019.

The directive aims to *"establish procedural safeguards to ensure that during criminal proceedings, suspected or accused children, i.e., persons under the age of 18, can understand and follow such proceedings and to exercise their right to a fair trial, and that children's recidivism can be prevented and their social integration facilitated"* (Directive, Article 1). The document, therefore, focuses on preserving children's emotional state, considering the interests of prevention.

The directive consists of 27 articles, providing for the scope and the right to information, according to which children must be informed immediately about their rights and the general aspects of the

procedures. Furthermore, the member states must ensure that their specific characteristics and needs related to protection, education, training, and social integration, i.e., criminogenic characteristics, are considered. Suspected or accused children must be assessed individually. The child's personality and maturity, family background, and, in some cases, family vulnerability must be considered.

To ensure special treatment, it states that *"Children shall in all cases receive treatment that protects their dignity and is appropriate to their age, maturity and intellectual level, and takes into account their specific needs, including possible communication difficulties."* (Directive, Article 13.)

The directive contains a very detailed description of children's rights and examines their personal circumstances. It is, therefore, no coincidence that it was also included in the Hungarian legal system, and its provisions are widely applied.

STATISTICAL ANALYSIS (DATA OF EUROSTAT COUNTRIES)

After reviewing the international legal regulations, the available statistical data must be examined to determine the international situation of juvenile delinquency. By examining these data and the different criminal age regulations, we can answer the question of whether the individual regulations are proportionate to the social danger inherent in the increase in juvenile crime.

One of the most reliable sources of statistical data is Eurostat, which, as the directorate general of the European Commission, provides the member states of the European Union with information not only on crime but also on all areas of life.

Table 4. *(URL3)*

Suspects and offenders by age - number and rate for the relevant age group					
	2018	2019	2020	2021	Age of criminal liability
GEO (Labels)					
Germany	248 034	249 972	225 632	223 614	14
Ireland	13 865	14 283	11 744	-	10/12
Greece	6 680	6 577	5 575	5 460	13
Spain	20 293	21 777	20 765	23 431	14
Hungary	53 945	126 134	128 797	136 950	12/14
Austria	28 827	33 705	30 178	28 930	14
Romania	8 434	8 622	6 567	6 292	14
Norway	7 063	7 430	7 416	7 986	15
Serbia	3 614	3 918	3 136	2 800	14

Based on the examination of the values in Table 4, it can be concluded that, in general, no significant increase can be observed in the development of the number of offenders. A decrease or stagnation is typical in the examined countries.

For example, in Romania, between 2018 and 2021, excluding the increase in 2019, their number decreased by 2,142. Even in Germany, which has a high number of crimes, a decrease can be observed, with 24,420 fewer crimes committed by juveniles in 2021.

However, it cannot be said that only a decrease can be observed based on the table. Unlike the 2020 data in Spain, 2,666 more offenders were recorded in 2021. A slight increase can also be observed in Norway, while the most noticeable increase occurred in Hungary. In 2018, 53,945 offenders were recorded, which increased by leaps and bounds in 2019 and reached 136,950 in 2021. That is 83,005 more juvenile offenders, about a two-fold increase. This data is significant compared to the other countries examined.

It is also worth observing the increase and decrease in the age of criminal liability. Most countries drew the limit at the age of fourteen. An increase (e.g., Spain) and a decrease (e.g., Germany) can be observed at this value. In the case of countries that set a lower limit, such as Ireland (10/12 years), there is a smaller decrease between 2018 and 2020, while in the case of Hungary (14 years, 12 years if the age limit is lowered), a significant increase is observed. In Norway, where the age limit is slightly higher (15 years), there is relative stagnation.

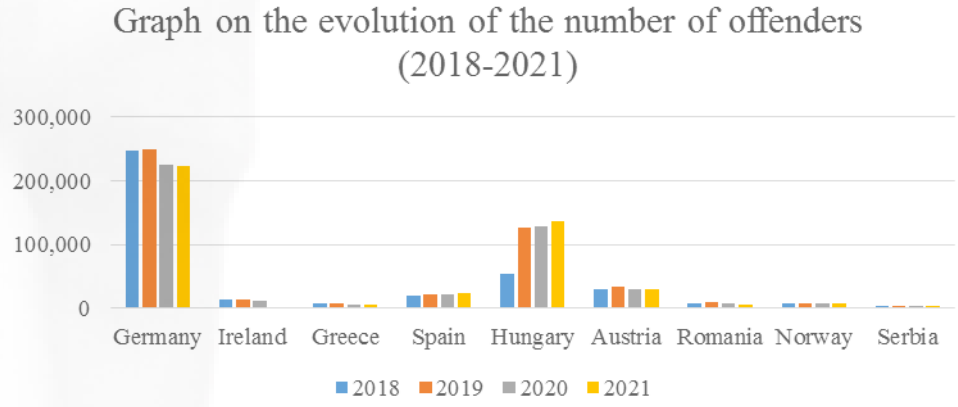


Figure 2. *Own Elaboration (URL4)*

The figure above clearly illustrates the differences between the examined countries and the increase or decrease within the countries. The exceptionally high number of juvenile offenders in Germany and Hungary is visible, followed by Austria and Spain, which are significantly behind.

In Germany, the decrease occurred in two steps, while in Hungary, it increased by leaps and bounds after 2018, after which only a smaller increase can be observed. A lower number of offenses and more minor changes can be observed in other countries.

When examining this data series, the question may arise: is the precise definition of the age of criminality really that important? Based on the available data, this cannot be stated with absolute certainty.

The age of criminal liability is not affected by changes in the number of juvenile offenders in a country. This suggests that adjusting or lowering the age limit does not necessarily reduce the social threat posed by juvenile offenders. Instead, a professional assessment of their capacity to understand, as well as an examination of their circumstances and motivations, can help us understand changes in the statistical data. This understanding can be used to develop a prevention plan and crime prevention strategies tailored to juvenile offenders. It is equally important to establish a justice system for juveniles that focuses on education and development rather than punishment, as the latter is not just a matter

of intention but also poses financial challenges. However, it is crucial to create a system separate from that of adults, as forcing juveniles into the adult justice system, especially in resource-constrained countries, can be socially detrimental and ineffective in the long run.

AGE REGULATION IN HUNGARIAN CRIMINAL LAW (ACT C OF 2012 ON THE CRIMINAL CODE)

Different branches of law have different definitions of childhood. However, they agree that the various definitions are related to age. The first term is that of minors, defined by the Civil Code: *"A minor is someone who has not reached the age of eighteen. A minor becomes an adult upon marriage."* (Civil Code, IV. Title, § 2:10. Minority, (1).) On the other hand, the Criminal Penal Code (hereinafter: Btk.) uses the designations juveniles and children. *"A minor is someone who has reached the age of twelve at the time of the crime, but not the eighteen"* (Btk., XI. Chapter, Basic provisions, § 105. (1)). The age of childhood is defined in the case of persons under the age of twelve. The age of criminal liability is set at fourteen: *"A person who has not reached the age of fourteen at the time of committing the punishable act cannot be punished, except for homicide [160. Section (1)-(2)], homicide committed in a violent act (Section 161), assault [Section 164 Section (8)], the act of terrorism [314. § (1)-(4)], robbery [365. § (1)-(4)] and the confiscation [366. Section (2)-(3)] of the perpetrator, if he was over the age of 12 when the crime was committed, and at the time of the crime he had the insight necessary to recognize the consequences of the crime."* (Btk, §.16.)

At the beginning of youth (twelve and fourteen years of age) and at the age of eighteen, the day following the birthday is the determining factor in terms of criminal liability. *"The date of the commission of the crime must be understood as the realization of the last moment of the act of committing the crime."* (Belovics et al. 2023). It does not matter if the juvenile becomes an adult during the criminal proceedings that are already underway.

When examining the concepts, it can be established that the definitions are based solely on the exact numerical definition of age. Personal circumstances and discretion only appear when lowering the age limit. In the history of criminal law, this is a generally accepted age definition that has undergone only minor changes over time (Szentmiklóssy-Szabó, 2015, 40.).

Why was the age limit lowered to twelve in the new Penal Code? According to the rationale, raising the age of criminal liability to fourteen is appropriate because that is when young people finish their primary school studies. On the other hand, lowering the age limit is necessary, according to the minister's official position, because nowadays, children reach the level of development and maturity required for discernment earlier; that is, the development of young people has accelerated. Furthermore, the position also states that the number of crimes committed by children (especially from the age of twelve to fourteen) has increased, and violent crimes also occur in a higher proportion. "*Violent advocacy is becoming more and more widespread among children between the ages of twelve and fourteen, which is why it is necessary to amend the age limit of criminal liability, to make children who commit flagrantly aggressive crimes against life criminally responsible, and in the case of some serious crimes lowering the age of criminal liability to twelve years* (T/6958. draft law on the Criminal Code, to § 16, p. 212.). However, the statistical data shows the opposite.

Table 5. *Own Elaboration*

Year	2000	2005	2010	2011	2012	2013	2014
Number of offenders under 14 years of age	3964	3697	2607	2714	2604	2196	1488

Source: https://ugyeszseg.hu/repository/mkudok6797.pdf

As can be seen from the tables, the legislator did not change the age of criminal liability because of a significant increase in crime among young people. So, what was the main reason?

The previously mentioned legal policy debates also affected social policy. Social pressure was increasing, and they urged the lowering of the age limit more and more. However, this pressure had nothing to do with the children's real state of development. They were not even interested in examining the psychological state; they only argued based on objective facts. *"The narrative of the age limit of criminal liability has now built significant positions for itself in the battle of "conservative penal policy versus restorative justice"* (Gyurkó, 2008, 40.), leaving no doubt that those who argue in favor of lowering the age limit are only supporters of punitive criminal law. The question has become an honest religious debate, in which the opposing parties use the same data series and statistical tables to support their arguments, according to their convictions. Therefore, the legislators wanted to meet society's expectations, which is why they entered an area that is primarily psychological and professional.

However, if we approach the topic differently, it becomes clear why we restrict juvenile offenses to specific years. This issue is very complex and should not be defined only in numbers. However, the question of the age of criminal liability is correctly interpreted if we see it as a cornerstone of one of the institutions of a broad system of instruments under state control. Regulating it in a specific way is unsuitable for dealing with this complex social problem effectively in the long term. However, the criminal justice system protects the state and its citizens and, by definition, constitutionally provides the strictest public law instruments (which limit citizens' rights to the greatest extent) to embody its central question (Tóth, 2017, 33.).

The issue is not the age limit of criminal liability itself since the main goal in all cases is the child's upbringing in the right direction. Therefore, when a child commits a crime, it is necessary to investigate what should happen to them and what kind of punishment could be used to achieve this goal.

AGE REGULATION AND THE ISSUE OF DISCRETION IN SERBIA

To really understand the importance of age regulation and capacity testing, we need to look at what is happening in a specific country and how society responds. Serbia is geographically close to Hungary, and the regulations regarding minors are similar to those in Hungary. However, due to recent events, society, especially the media, exerts its most significant influence and urges a change in regulating youth criminality.

The Framework of the Criminal Law Regulation

The 2005 Criminal Code of the Republic of Serbia entered into force on January 1, 2006, and criminal judgments are still based on this regulation. Concepts according to the Code include:

"(8) Child: a person under the age of fourteen. (9) Minor: a person who has reached the age of fourteen but has not reached the age of eighteen. (10) Minor: a person under the age of eighteen." (Criminal Code RS, Chapter 12.)

Section 4 of the first chapter (Basic Provisions) provides for the age of criminal liability, according to which: *"(3) A criminal sanction may not be imposed on a person who has not reached the age of 14 at the time of committing the act. Educational measures and other criminal sanctions may be imposed on juveniles under conditions prescribed by law."* (Criminal Code RS, Chapter 1, Section 4, (3). Therefore, Serbia has an independent law on juveniles, which became law under the title *The law on juvenile criminal offenders and criminal protection of juveniles.*

The principle of "child-friendly justice"—the child-centered approach to justice — prevails in this country as well. A study published in the journal Child Rights Center[4] describes the importance of this in detail, highlighting, for example, the institution of independent legal representation of children, which is a well-functioning method of protecting rights. The study emphasizes that international legal standards should take precedence in juvenile justice, particularly with the ministerial guidelines of the Council of Europe. This work is aimed at professionals in the justice system, particularly officials in this field. It provides detailed information on the legal institutions that contribute to ensuring comprehensive legal protection (Stevanovic, 2013). When considering the independent law on juveniles in conjunction with this work, it can be said that Serbia is making positive strides in regulating juveniles.

Juvenile Law

Article 3 of the law on juvenile criminal offenders and criminal protection of juveniles includes the definitions described above and the concept of a "young adult". According to this provision, the court can impose any alternative sanctions for offenders under twenty-one if it is anticipated that educational measures will achieve the same goal as punishment, given the nature of the crime and the circumstances of its commission.[5]

Furthermore, the law lists special sanctions for minors and outlines their purpose. The purpose of criminal sanctions is to ensure the juvenile's personal rights, development, and improvement through responsibility, education, appropriate personality development, protection, assistance, and resocialization into the community.[6] Therefore, the prevention goal defined in international principles is also expressed in this law. The entire legislative text reflects the intention to protect children's rights. One example of this is the diversion institution, the purpose of which is contained in Article 6: "*to avoid criminal proceedings or to suspend them by increasing personal responsibility to prevent future relapses. Additionally, when imposing individual sanctions and measures, the court considers the juvenile's lifestyle, personal and living conditions, and the gravity and nature of the committed crime*". [7]

4 Child Rights Center, Serbian civil association for the protection of children's rights, founded in 1997

5 Official Gazette of the Republic of Serbia No. 85/05 (2005), Article 3 (Age of Offender).

6 Official Gazette of the Republic of Serbia No. 85/05 (2005), Part Two (Criminal provisions on juveniles), Article 10 (Purpose of Educational Measures and Juvenile Prison Sentence)

7 Official Gazette of the Republic of Serbia, No. 85/05 (2005), Part Two (Criminal provisions on juveniles), Article 6 (Purpose of Diversion Order)

The provisions of the Republic of Serbia concerning minors are focused on children, taking into account their circumstances and their ability to judge, similar to Hungarian laws. A separate law has been prepared to respect and protect their rights. However, due to recent events, there is public pressure for these laws to be revisited and revised.

Current Problems

Which events have changed the public attitude and emphasized the increasing social danger associated with juvenile delinquency in the media?

The first incident occurred on May 3, 2023, at an elementary school in Belgrade. A fourteen-year-old boy started shooting in the early hours of the morning with weapons kept at his home. Eight children and a security guard were killed in the shooting, and several students were injured. The perpetrator had been planning the attack for nine months and was found to have a list with the names of those he planned to shoot, as well as a blueprint of the school building (URL5). The reason for his crime is unclear. The ready availability of weapons in the Republic of Serbia after the Yugoslav wars of the 1990s, which reached the civilian population, also contributed to the crime. Many people keep guns at home, but school shootings have been rare in the country until now.

The second incident happened on May 5, 2023, when a twenty-one-year-old man shot several people with an assault rifle in Mladenovac, near Belgrade. Eight people lost their lives, and thirteen were wounded in this attack. The attack was not planned, and the perpetrator opened fire on young people in a schoolyard (URL6).

Since these two attacks, more than a hundred bomb threats have also been made at schools. These events shocked the public, and the media highlighted their brutality. Due to social pressure, Serbian President Aleksandar Vucic proposed lowering the age limit for criminal responsibility from fourteen to twelve. This could be implemented with either a partial reduction, similar to the current regulation, based on an assessment of the ability to discern or a complete lowering of the age limit. Another significant issue affecting juveniles, as an external, objective criminological factor, is the problem of excessive gun possession in the country. Serbia seems to be undergoing changes similar to those made by Hungary when it created its current legal code. There is a focus on making external and objective changes, such as modifying the rules for carrying weapons, which seems like a step in the right direction (URL7). However, the question remains whether simply lowering the age limit would effectively address the social issue of increasing school-related offenses. Drawing from the situation in Hungary, it is uncertain whether this alone would solve the problem.

SUMMARY FINDINGS

Key findings from the study include an analysis of the criminological causes of juvenile delinquency, a review of the historical development of legal perspectives, and an exploration of hypotheses supported by domestic and international statistics. A closer look at the situation in Serbia sheds light on changes made in Hungary to the age of criminal liability and its regulation.

One suggestion is that criminal policy considerations largely influenced Hungary's decision to reduce certain crimes' criminal age. Based on the study's evidence, this seems to be the case. While juvenile delinquency has increased in Hungary, it does not pose a significant threat to society. The decision to lower the age limit seems to have been driven more by media and public opinion than by the actual

danger posed by these cases. It is argued that more emphasis should be placed on personal circumstances when shaping regulations, possibly by creating a specialized Hungarian law code for juveniles.

In the context of the second hypothesis, it can be argued that international and EU standards clearly outline expectations but do not have binding force. Unfortunately, they do not fully resolve the dilemma of balancing the need to protect society from criminals while ensuring children's healthy physical and mental development. The Convention, in Article 40, point 3. a), sets a requirement for member states regarding the minimum age of criminal liability. It states that *"States parties to the Convention shall use all their efforts to promote the adoption of special laws and procedures, and the establishment of authorities and institutions for children suspected of committing a crime."* The United Nations Committee on the Rights of the Child has recommended that the minimum age of criminal responsibility be set at 14 years or preferably higher. Hungary was invited to raise the minimum age of criminal liability from 12 to 14 for all crimes in March 2020. Criminal prosecution aims to protect society from behaviour that harms its interests and values, including acts committed by children. It is generally accepted that children may be held criminally responsible upon reaching a certain age despite the adverse effects on their moral and intellectual development. Many countries, like Hungary, set the minimum age of criminal liability at eighteen years, which aligns with international legal documents and requirements. State intervention leading to criminal liability may occur when the family's contribution to a child's development proves insufficient. Therefore, intervention in the case of juvenile delinquents not only protects society but also serves the child's interests (25/2022. (X. 26.) AB decision). Addressing the historical dimension, the study points out the perennial challenge of determining a suitable age for discernment in criminal cases. The international perspective reveals that while many countries have similar age limits, there are differences in both directions. It is noted that international regulations emphasize a child-centered, preventive approach, setting an example to be followed. Some countries have independent juvenile laws which have successfully prevented a significant increase in juvenile offenders. Therefore, the study advocates for a unified system accepted by multiple countries, integrating international regulations into legal systems, and a more thorough examination of juveniles' judgment and personal circumstances, along with addressing the objective problems specific to each country.

Lastly, the study acknowledges that while Hungary's criminal law and criminal procedure law regulations regarding the age limit and discernment are relatively modern and progressive, there is still room for improvement. Addressing the increase in juvenile offenders in Hungary would require comprehensive judicial reform beyond changing age regulations. This would involve institutionalizing educational and pedagogical tools involving civil and state actors to enforce unique prevention goals related to juveniles more effectively. It is suggested that by understanding and scientifically analysing the common causes of crimes, a more comprehensive solution to this complex problem could be developed.

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INTERNATIONAL COOPERATION AND SPECIAL INVESTIGATIVE MEASURES

Sasho M. Stojanovski, PhD[1]
Ministry of Interior, North Macedonia

INTRODUCTION

Crime as a socially harmful phenomenon follows society and its growth and development, changing only its apparent forms and methods of action. It always adapts quickly and easily to new social conditions. As a phenomenon, it finds its roots in individual offenses and violators of prescribed norms of behaviour. Later, street gangs and criminal groups appear which, over time, join together and expand their criminal behaviour.

Open state borders, reduced border controls, rapid and comprehensive development of science, technique and technology, especially computer technology, among other benefits, enabled a rapid flow of people and objects. Criminal organizations and their organizers recognize the convenience of easy transfer of crime from one country to another, from one region to another. Perpetrators of crimes quickly and easily change their place of residence after committing a crime. With their practice, they have unlimited opportunities to achieve their goal - the realization of profit and power. As a consequence of such situations, criminal acts with elements of organization and international characteristics have recorded a constant increase. The number of fugitives from the law is also growing, and thus the number of criminal proceedings conducted in their absence. Crime has brought dangers that can seriously threaten young democratic states. Such conditions make it difficult and complicated to identify, detect and prove.

Globalization as a worldwide process with rapid changes in the legal, political, social, economic, financial areas and communications of all kinds has enabled the overcoming of national borders. At the same time, such changes contributed to the emergence of new forms and ways of committing crime, in which well-organized individuals and groups, professionals, repeated offenders meet as organizers and executors. There are no obstacles and state borders for mutual cooperation to achieve their goals. Quick and easy adaptation to new social conditions contributed to its representation in all countries of the world, regardless of their level of development and type of arrangement.

The international community has recognized crime as a new phenomenon that still represents a special security problem, a serious threat and danger to states and the international community. The harmful consequences that it can cause become the reason and necessity for constantly undertaking and promoting the measures and activities for its prevention and suppression.

Due to its characteristics and as a new phenomenon for which there is still no single and generally accepted definition, it is constantly a challenge and in the centre of attention of the ordinary person, the scientific and professional public. For these reasons, its prevention and suppression require a serious and multidisciplinary approach both on national and international level. International cooperation in dealing with crime is foreseen and implemented in accordance with international conventions, protocols

1 smstojanovski@yahoo.com

and other legal acts and takes place in the direction of cooperation between states. At the national level, activities take place between national agencies, institutions and bodies in charge of dealing with crime.

The emergence of new forms and ways of committing crime impose the need to find and develop new forms of cooperation (Kambovski, 2005), its constant intensification and improvement. Within the framework of the paper, research and analysis of the international cooperation and use of special investigative measures in our country will be made for a period of three years.

CRIME

Crime as a social and harmful category is not an unknown category because it occurs and manifests itself in all societies. As a phenomenon in any of its forms, it is a human creation that follows its development and adapts to the conditions it creates. It is hardly known in the original community (Newman, 1999: 64). The emergence and division of society into classes changes the conditions for people's life and survival. The first antisocial behaviours also appear such as prostitution, betting, begging, wandering and crime. Crime finds its roots in individual offenses and violators of prescribed norms of behaviour.

Later, street gangs and criminal groups appeared which over time joined together and expanded their criminal behaviour. The emergence of piracy in the 17th century and the robbery of merchant ships and the illicit trade in opium are considered to be the first emerging forms in the UK in which active states were also included for political, economic or financial reasons and interests.

Today's forms of crime are thought to have originated in the late 19th and early 20th centuries on the American continent. In the 1980s, it spread rapidly and unstoppably, first through the developed Western European countries, and later also in the poorer countries.

Crime, according to its emerging forms, ways, methods and environments in which it appears and acts, is difficult to identify, particularly to detect and prove. As actions, they can be divided into property, blood, sexual, traffic offenses, economic and political ones, actions against the military forces, against the state, etc. According to the territory on which criminal activities are carried out, they can be local, regional, national and transnational. Depending on the type of criminal activities, the ways and means of their execution also differ.

ORGANIZED CRIME

The developments of science and new technical technological discoveries have a positive effect on the overall development of man and society. Globalization as a worldwide process with rapid changes in the legal, political, social, economic, financial areas and communications of all kinds has enabled the overcoming of national borders. At the same time, such changes contributed to the emergence of new forms and ways of committing crime, in which well-organized individuals and groups, professionals, repeated offenders meet as organizers and executors. There are no obstacles or national borders for their mutual cooperation. The new crime only changes its forms and ways of organizing and acting over time. Quick and easy adaptation to new social conditions contributed to its representation in all countries of the world.

Organized crime represents a special form of professional crime that especially began to develop at the beginning of the 20th century in the developed Western countries, and then spread to the countries in

transition. In 1990s, its presence was observed in all states and spheres of social life, and as such it represented a dangerous threat to the future development of democratic states. It should also be taken into account that this type of crime is able to control young democratic societies and their future development.

The dysfunctionality of the rule of law, the predominance of politics over law, disregard for laws, rapid social, economic and political changes, migrations, the development of transport and communications, problems in certain regions and countries in the transition process and crises of all kinds that have arisen in recent years (economic, military, health, financial) are some of the reasons for its emergence and rapid growth (William, 1994:103). Organized crime, together with money laundering, corruption and terrorism, today represents a serious threat to destabilize social, economic, political institutions and a danger to the sovereignty of states.

Since its inception, the term 'organized crime' has been a controversy for the scientific world, a term shrouded in mystery. For those reasons, there are countless definitions even today, but there is not one definition that would be acceptable to all countries (Woodiwiss, 2001:177). The reasons for this can be sought in its transnational nature, the ability to cross state borders, the constant search for appropriate forms necessary for its execution and protection, its internationalization, interconnections and the constant commitment to achieve a greater and more significant influence on political and economic life of the states.

Organized crime does not recognize national borders. Its international character is expressed by mobility, adaptability, finding new methods and forms of action. For these reasons, there is almost no country in the world, regardless of their level of development and state of affairs, in which it is not manifested in any of its forms. Criminal organizations always try to get involved in the existing systems and institutions using appropriate methods and ways (corruption, blackmail, use of violence, recklessness, intimidation) with the sole purpose of gaining power and profit and using them to carry out their future illegal activities. Practicing such methods of action, causes enormous and irreversible damage to the states and the international community in general.

As for security, crime and cooperation, there are daily discussions at all levels. Everyone is talking: politicians, lawyers, economists, sociologists, criminologists, scientists and ordinary people. Due to their topicality, they have been the subject of numerous conferences, meetings, seminars at which numerous conventions, protocols, resolutions, recommendations were adopted. Due to their seriousness and topicality, they are the subject of numerous daily articles and announcements in the public media. Numerous researches have been carried out and conclusions have been drawn, countless theses have been presented.

Due to its characteristics and as a new phenomenon, it is constantly a challenge and in the centre of attention of the ordinary person, the scientific and professional public. Dealing with crime is a complex activity that basically consists of the activation of preventive and repressive measures. Some of the measures are implemented by the police, some by the judicial authorities and some jointly and coordinated by the two institutions. In this direction, special and specialized agencies, and bodies are formed within the police and the judiciary (Interpol, Europol, SELEC, ILECU, Eurojust, European Judicial Network, CEPOL).

Numerous conventions, protocols, recommendations and other legal acts are enacted and adopted. Congresses, conferences, seminars, trainings and other forms of education are being organized and implemented. New instruments are also being introduced to provide the suspected perpetrators with quality evidence for the successful initiation and conduct of criminal proceedings (Red notice, EAW, FAST, ENFAST, SIM).

For these reasons, its prevention and suppression require a serious and multidisciplinary approach, both on a national and a wider international level.

At the national level, the activities take place between national agencies and institutions in charge of dealing with crime. Also, legal acts are adopted that are appropriate for the new conditions of crime. Domestic legislation constantly follows and complies with international legal acts.

National policies and commitments to deal with crime alone are not able to provide an appropriate answer. Also, the instruments of international cooperation are not able to do that. For these reasons, only a joint and coordinated performance can contribute to more successful dealing with crime.

The emergence of new forms and ways of committing crime imposes the need to find and develop new forms of cooperation, as well as to constantly intensify and improve it.

International cooperation in dealing with crime is foreseen and implemented in accordance with international conventions, protocols and other legal acts and takes place in the direction of cooperation between states. Cooperation becomes a necessity and the only organized response to crime. Basically, it implies mutual respect and solidarity. As an instrument of international cooperation, it is under the competence of national state authorities, and as a legal instrument, it is under the competence of judicial authorities. Cooperation foresees and presupposes the existence of certain conditions and procedures.

COOPERATION

Under conditions of increasingly intensive growing movement of capital, material and immaterial goods, regardless of the existence of state borders, interstate legal traffic between states and international organizations and institutions becomes very complex and diverse. The presence of the foreign element in such relations requires knowledge of both national and valid international agreements, bilateral or multilateral and other legal regulations. The beginning of the 21st century in international relations is characterized by efforts to unify the legal systems, especially in the sphere of civil law and criminal law relations, which, despite the similarities, are still different. Even in the criminal matter today, elements with international characteristics are found which, in addition to knowledge of domestic legislation, also require knowledge of international law.

The emergence of new forms and methods of action of transnational organized crime created numerous problems for the police and judicial authorities both at national and international level. Aware of the different approaches and interpretations and definitions of crime, the differences in the penal systems, the different forms of organization of the criminal law authorities, the existence of different practices, the differences in economic development, the high degree of corruption at all levels, restraint and mistrust in the exchange of information and data in dealing with crime require the need to find generally acceptable new solutions and instruments.

Today, in the conditions when the existing crime that does not recognize state borders, international cooperation takes on a significant place and role, that is, it becomes an imperative for the realization of international solidarity in the fight against crime.

The cooperation basically enables the formation of common databases, coordination and support in the process of their exchange between the agencies and institutions in the states and the state authorities at international level competent for the detection and prosecution of the perpetrators of crime.

The efforts usually end with the signing of bilateral and multilateral cooperation agreements and with the establishment of cooperation between intelligence and other services.

Global events on the world stage were the reason why international judicial police cooperation became especially relevant in the last decade. It has become universally recognized as an instrument in overcoming the problems with new forms of crime. It is constantly subject to intense regulation both by legislative bodies at the national and international level.

For the police and judicial authorities, the emergence of transnational organized crime has created and continues to create numerous problems that can be identified in different interpretations and definitions of crime, language, differences in criminal justice systems, various forms of organization of criminal justice authorities, the existence of differences in police and court proceedings, etc. At the international level, the moments when the police authorities started procedures for all criminal acts and not only for political ones, and when the cooperation from the temporary and limiting character gained consistency and organization, are considered particularly important stages for its development.

Further follows the development of international criminal law after the World War II with the establishment of the International Military Court (1945), then the Hague Tribunal (1993) and the International Criminal Court (1998), international cooperation is manifested and applied based on international standards, norms and institutions. International police and criminal justice cooperation extends to the recognition and execution of foreign criminal judgments and the transfer of convicted persons.

International police cooperation has historical foundations. It emerged with the formation of nation states in the 19th century and the appearance of the first forms of organized crime. As it became more complex and acquired characteristics of an international one, and considering the fact that the state is not able to handle it alone, the demands of the states for cooperation increased. Historical records and evidence show that the development of international police cooperation was aided by previously acquired cooperative practices created primarily for political reasons.[2] The emergence of international law in the direction of law enforcement and rapid and significant social changes are reasons for changing and adapting to the new conditions of the practices and organization of criminal law enforcement authorities.

Even in today's conditions, crime represents a special security problem, a serious threat and danger to states and the international community. The harmful consequences that it can cause to the individual and society are the reason for constantly taking and improving the measures and activities for its prevention and suppression. Crime today with its characteristics of constant growth, rapid adaptability to new social conditions and changes and internationalization makes it difficult to identify and detect. The practice of the existing preventive and repressive measures does not give the expected results. For these reasons, their constant review, adjustment and introduction of new ones is required. The fact is that by independently activating any institution, measure and activity today, crime cannot be completely eliminated. Keeping it to the lowest possible limits is considered the main goal in dealing with it. Considering the fact that today's crime knows and recognizes no national borders, the national approach in dealing with crime becomes aimless and pointless.

Its internationalization requires the activation of appropriate measures, activities and instruments of international cooperation. Cooperation based on informal interstate agreements can also produce only a partial effect and result. In this direction, only the measures of harmonization of the domestic

2 The need for international control of persons and organizations opposed to the existing political systems – socialists, liberals, democrats, anarchists.

legislation with the international ones and finding new effective instruments of cooperation can advance and develop the international cooperation in dealing with crime. International cooperation in criminal matters is realized based on many legal acts.[3]

INSTITUTIONS

Interpol

The growing number of committed crimes with elements of organized crime and its internationalization at the beginning of the 20th century imposed the need to find new forms of organizing the international community to deal with this kind of crime. In that direction, the delegations of 20 countries at the Second International Congress held in Vienna in 1923 made a decision to establish the First International Police Authority - the International Criminal Police Commission. The main objectives consisted in facilitating the cross-border cooperation of the criminal police, providing reciprocal assistance to the police authorities in accordance with their national laws and creating and perfecting the conditions and methods for effective crime fighting. Over time, Interpol has grown into the largest international police organization in the world, having today 195 member countries. It is located right after the United Nations. The headquarters of the General Secretariat is located in Lyon, France.

The organization supports and provides assistance to all government organizations, bodies and agencies whose work is to prevent and fight against international crime. In its operation, the organization is focused on secure global police communication system, operational services and police databases, operational police support and police training and development. Also, Interpol has rapid reaction teams and major event support teams.

Priority activities are aimed at public safety, terrorism, drug and human trafficking, criminal organizations, financial and computer crime, corruption and fugitives from the law. The activities for which Interpol is recognizable include search for persons and objects. Through its channels, thousands of electronic requests/posts circulate daily in different colours that indicate its content and meaning, that is, the type of search.

International police cooperation, the establishment of standards in the conduct, the training of personnel, the exchange of police information (even between those countries that have not established an official relationship), assistance in investigations and notifications for persons who are the subject of an international search are the main activities of Interpol. In the implementation of its activities, it respects national legislation and international legal acts.

International police cooperation takes place in accordance with the principles of: respect for national sovereignty and legislation, the application of criminal law, universality, equality of all member countries, cooperation with other institutions and agencies through the National Central Bureaus - NCB, and flexibility in working methods. Respect for these principles implies that the national police undertake and carry out the measures and activities and inform the requesting country about them and the reply may be used for police or court proceedings.

3 The United Nations Convention against Transnational Organized Crime, adopted by General Assembly resolution 55/25 of 15 November 2000; United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 19 December 1988, Entry into force: 11 November 1990; European Convention on Extradition, Paris, 13 December 1957; European Convention on Mutual Assistance in Criminal Matters, Strasbourg, 20 April 1959; Convention on Laundering, Search, Seizure and Confiscation of the Proceeds from Crime, Strasbourg, 8 November 1990.

It fulfils its role through the so-called global communication system. I - 24/7 which means 24 hours a day, 7 days a week. The system enables the police forces to be more efficient in performing the assigned tasks. The system was created in the four official world languages, English, French, Spanish and Arabic. Within the framework of Interpol, six regional sub-bureaus[4] operate with the task of coordinating activities in the region for which they were established, and creating conditions for a faster exchange of information and data. It prepares and publishes general and special publications for its activities.

EUROPEAN UNION AGENCIES FOR JUSTICE AND HOME AFFAIRS

The realization of the basic goal of the EU, i.e. freedom, security and justice, required the establishment of special agencies in the field of justice and internal affairs. According to the regulations, they function by exercising controls, monitoring and planning activities in the areas for which they were established. They work and participate in joint operational activities and exchange of information and data. Mutual institutional cooperation and trust is of key importance for the achievement of its tasks and goals. EU regulations are voted by the European Parliament and the Council. Mutual cooperation is achieved by respecting the national systems of the member countries. In the area of order, security and border controls, FRONTEX, EU-LISA and EUROPOL have the greatest jurisdiction.

In the field of law, justice and social policy, the following have the main responsibilities: EASO, EIGE, EMCDDA, CEPOL, FRA and EUROJUST.

CEPEJ – European Commission for the Efficiency of Justice.[5] Bearing in mind the fact that the principle of the rule of law cannot be ensured without fair, efficient and accessible judicial systems, the Committee of Ministers of the Council of Europe, with Resolution REs (2002) 12, established CEPEJ in which the representatives are experts from all member countries.

In order to increase the efficiency of justice systems in the member countries of this organization, the Council of Europe pays special attention to activities in that direction.

In order to achieve the desired goal, several bodies have been constituted that work on the preparation of international instruments that will be available to the member states, the preparation of reports in which practical measures and activities will be offered to overcome the shortcomings that have already been established and the realization of research on the functioning of the judicial systems of the member states.

The cooperation between the member states takes place in several directions, that is, in analyse the different justice systems, in facilitating the application of various legal instruments that increase the efficiency of justice and finding concrete measures that should improve the justice systems in Europe.

The Appendix to the Resolution presents the Statute of the Commission, which contains the objectives, functioning, working methods, procedures and composition of this body.

EUROJUST – The Agency for Criminal Legal Cooperation was established and operates in accordance with Decision No. 2002/187 – JHA.[6] The Decision was repealed and replaced by Regulation

4 Argentina (Buenos Aires), Cameroon (Yaoundé), Côte d'Ivoire (Abidjan), El Salvador (San Salvador), Kenya (Nairobi), Zimbabwe (Harare)

5 The European Commission for the Efficiency of Justice (CEPEJ) was established on 18 September 2002 with Resolution Res(2002)12 of the Committee of Ministers of the Council of Europe

6 Decision 2002/187 - 2002/187/JHA: Council Decision of 28 February 2002 setting up Eurojust with a view to reinforcing the fight against serious crime

(EC) number 2018/1727 of 14 November 2018. The basic activities are carried out by coordinating the work of national authorities, investigations and prosecutions of transnational organized crime. It pays particular attention to terrorism, internet crime, human trafficking, drug trafficking, migrant smuggling, crimes against EU financial interests, economic crime, money laundering and fraud.

EIGE – The European Institute for Gender Equality was established and operates in accordance with Regulation (EU) number 2006/1922 of 20 December 2006.[7] in order to contribute, strengthen and promote gender equality and its integration in all EU policies.

EMCDDA – The Centre for monitoring narcotics and drug addictions was established and operates in accordance with Regulation (EU) number 2006/1920 of 12 December 2006,[8] in addition to the regulation from 1993 in order to provide and analyse information on EU level regarding narcotics, addiction and their consequences.

FRA – European Agency for Fundamental Rights. It was established and operates in accordance with Regulation (EU) number 2007/168 of 15 February 2007.[9] It performs its activities by collecting and analysing laws and data, helps in the implementation of laws, supports and strengthens cooperation and ties with EU member states.

EUROPOL – Agency for cooperation in law enforcement.[10] It was established and operates in accordance with the Decision of the European Parliament and the Council number 2009/371-JHA, supplemented by Decisions number 2009/934-JHA, 2009/935 – JHA, 2009/936 – JHA and 2009/968 – JHA. Previously adopted decisions have been replaced by Regulation (EU) number 2016/794 of 11 May 2016. The agency provides an effective response to serious and international Organized crime, cyber-crime and terrorism threats by sharing information and data and providing proactive operational support. The databases and services are available to the relevant authorities in the Member States.

EASO – European Asylum Support Office was established and regulated by Regulation (EU) number 2010/439.[11] It was established in order to improve the implementation of the common asylum system and to coordinate the provision of operational support to member states.

EU - LISA – The agency for operational management of large IT systems was founded and operates according to Regulation (EU) number 2011/1077.[12] The competences have been increased by Regulation (EU) 2018/1726. The agency provides support to member states for safer Europe with the technological operational management of large EU systems. It manages 3 large IT systems covering visas – the Visa Information System (VIS), asylum applications and the exchange of information and data in the Schengen area – the Schengen Information System (SIS 2) and EURODAC.

CEPOL – The Law Enforcement Training Agency was established and operates with Regulation (EU) number 2015/2219 of 25 November 2015.[13] It contributes to greater security by facilitating coopera-

7 Regulation (EC) No 1922/2006 of the European Parliament and of the Council of 20 December 2006 on establishing a European Institute for Gender Equality

8 Regulation (EC) No 1920/2006 of the European Parliament and of the Council of 12 December 2006 on the European Monitoring Centre for Drugs and Drug Addiction (recast)

9 Council Regulation (EC) No 168/2007 of 15 February 2007 establishing a European Union Agency for Fundamental Rights

10 Council Decision 2009/371/JHA establishing the European Police Office (Europol)

11 Regulation (EU) No 439/2010 of the European Parliament and of the Council of 19 May 2010 establishing a European Asylum Support Office

12 Regulation (EU) No 1077/2011 of the European Parliament and of the Council of 25 October 2011 establishing a European Agency for the operational management of large-scale IT systems in the area of freedom, security and justice

13 Regulation (EU) 2015/2219 of the European Parliament and of the Council of 25 November 2015 on the European Union Agency for Law Enforcement Training (CEPOL) and replacing and repealing Council Decision 2005/681/JHA

tion, sharing knowledge between law enforcement officials in EU member states, but also with third countries to a certain extent, especially in the area of serious crime.

FRONTEX – The Border and Coast Guard Agency was established in accordance with Regulation (EU) number 2016/1624.[14] With Regulation (EU) number 2019/1896 of 13 November 2019 the mandate is strengthened and the competences are increased. The main activities consist in the management of the external borders of the EU and the fight against cross-border crime. It is the guardian and driving force for the integrated management of European borders.

JHAAN – Justice and Home Affairs Agency Network.[15] The network was established to facilitate and promote mutual cooperation and information sharing. All other agencies are included in the network. The network helps in the implementation of measures and activities in the field of security, justice, fundamental rights and gender equality. It is actively involved and works in the field of migration, border management, drug and human trafficking, fight against Organized crime and gender equality.

EJN – European judicial network.[16] It has been functioning since 1998. The network is composed of national contact points – prosecutors, judges, representatives of the Ministry of Justice and law enforcement authorities. It was founded in order to facilitate international judicial cooperation in criminal matters, that is, to identify and establish direct contacts, providing legal and practical information on judicial cooperation.

The network allows practitioners to make direct contact with their colleagues, provides a secure telecommunications connection to support the operational work of the national contact points. The network actually represents a forum for discussions about the practical and legal problems they face in the course of their work.

INSTRUMENTS

International cooperation is carried out in accordance with the provisions of the Law, international agreements or with a legal act that regulates criminal procedures that are under the jurisdiction of international courts.

Cooperation also implies protection of sovereignty and security, double incrimination, prohibition of double punishment, reciprocity, urgency and efficiency in action, direct communication and cooperation, mutual trust and recognition and execution of court decisions. The cooperation applies to all criminal proceedings and criminal acts which, at the time of submission of the petition - the request for international legal assistance, are under the jurisdiction of the judicial authority of the requesting state, in the proceedings before the European Court of Human Rights, the European Court of Justice, the International Criminal Court and other international organizations.

14 Regulation (EU) 2016/1624 of the European Parliament and of the Council of 14 September 2016 on the European Border and Coast Guard and amending Regulation (EU) 2016/399 of the European Parliament and of the Council and repealing Regulation (EC) No 863/2007 of the European Parliament and of the Council, Council Regulation (EC) No 2007/2004 and Council Decision 2005/267/EC

15 Established in 2019, the network includes nine agencies: CEPOL, EASO, EIGE, EMCDDA, EU-LISA, Eurojust, Europol, FRA and Frontex.

16 The European Judicial Network (EJN) is a network of national contact points for the facilitation of judicial cooperation in criminal matters. The EJN was created by Joint Action 98/428 JHA of 29 June 1998 to fulfil recommendation n°21 of the Action Plan to Combat Organised Crime adopted by the Council on 28 April 1997. In December 2008, a new legal basis entered into force, Council Decision 2008/976/JHA of 16 December 2008 on the European Judicial Network (hereinafter the "EJN Decision"), which reinforced the legal status of the EJN, while maintaining the spirit of 1998.

International legal assistance, the transfer of criminal proceedings, extradition, the execution of criminal judgments and the transfer of convicted persons, the recognition and execution of foreign criminal judgments and the transfer of convicted persons are considered modern instruments of international cooperation in criminal matters. International legal assistance implies several activities.[17]

SEARCHES

The search for persons is one of the most important measures and instruments used by police authorities in dealing with crime, that is, locating, finding and depriving fugitives of the law of their freedom. Its effectiveness has a direct impact on the course of criminal proceedings (Stojanovski, 2014). Usually, the search begins with issuing a national or international warrant through Interpol channels. In order to increase efficiency, new methods are introduced (SIM), special services and specialized teams are formed (FAST, ENFAST), new legal acts are adopted, and the already adopted ones are changed and adapted to the new conditions. The effective search for fugitives from the law at international level ends with the extradition of the person, which as an instrument of cooperation considered to be the oldest tool. In international frameworks, extradition over time becomes part of international criminal law. In the last twenty years, in dealing with crime and the deprivation of freedom of fugitives from the law, the determination and implementation of SIM has gained a special role, place and importance. The creation of legal presumptions for the determination of these measures is considered the greatest benefit in the fight against crime. The dilemmas surrounding the threat of human rights and freedoms guaranteed by the constitutions and laws have been overcome by their legal regulation.

Interpol's Red notice, European Arrest Warrant, extradition, transfer of convicted persons, FAST and ENFAST as instruments are directly related to the search for the simple reason that if a warrant is not issued, there is no search for fugitives from the law.

RED NOTICE

Red notice as an instrument of search is considered the first and oldest form practiced by the police authorities in dealing with fugitives from the law. International warrants are one of the basic tools in operation. There are eight types of notices circulating through IP channels,[18] each with a special colour and for a special purpose. A red notice is issued for the deprivation of a person for whom an international warrant has been issued and his extradition, a blue notice is issued for locating a person or determining his place of residence, for warning about the presence of a person known to be a per-

17 Delivery of documents, written evidence and objects related to the procedure in the requesting state, delivery and exchange of information, notices and regulations, examination of a witness, victims or expert person, temporary transfer of a person deprived of liberty, cross-border monitoring, joint investigation teams, search of premises, persons and objects, examination via video or telephone conference connection, temporary securing of objects, property and assets, special investigative measures, delivery of extracts from criminal records.

18 Red Notice: To seek the location and arrest of persons wanted for prosecution or to serve a sentence; Yellow Notice: To help locate missing persons, often minors, or to help identify persons who are unable to identify themselves; Blue Notice: To collect additional information about a person's identity, location or activities in relation to a criminal investigation; Black Notice: To seek information on unidentified bodies; Green Notice: To provide warning about a person's criminal activities, where the person is considered to be a possible threat to public safety; Orange Notice: To warn of an event, a person, an object or a process representing a serious and imminent threat to public safety; Purple Notice: To seek or provide information on modus operandi, objects, devices and concealment methods used by criminals; INTERPOL–United Nations Security Council Special Notice: Issued for entities and individuals who are the targets of UN Security Council Sanctions Committees.

petrator of criminal acts on the territory of one or more states, a green notice is issued, for identifying bodies as well as for reported missing persons, yellow notices are issued.

The red notice is issued by Interpol as an instrument of international police cooperation. The red notice is issued for persons who are the subject of a search for the purposes of the criminal procedure and for persons who are wanted for serving a final court criminal sanction. Red notice is intended exclusively for finding and deprivation of liberty of fugitives from the law for the purpose of their extradition. The basis for its issuance and notification is the existing court order for the deprivation of liberty of the person. Its processing through Interpol channels means that it becomes active and available to all Interpol member states at the same moment.

The extradition procedure begins with activities that are under the authority of the police, that is, with the deprivation of the person's liberty. In accordance with national and international legislation, for this purpose, the police issue a warrant first at a national level. If during the search for the person, he/she is not found and deprived of liberty and information is obtained about his stay abroad, the police take actions to issue an international warrant through IP channels.

Both the national warrant and the red notice are issued with the same purpose of finding the person and depriving them of their freedom in order to extradite them. The request for the issuance of an international warrant must be in the prescribed form and contain the identification data for the person, court data and the measures to be taken. As a basis for deprivation of liberty, a large number of IP member states recognize the red notice, and as such it is an important instrument of international police and judicial cooperation.

EUROPEAN ARREST WARRANT

Freedom, justice and security are considered indivisible within the EU. The control of the external state borders and the fight with the Organized crime and terrorism are among the priorities of the EU authorities and bodies. The basic assumptions for successfully dealing with the new challenges are required in the joint action of the criminal law authorities and the police, including here the customs and other agencies competent for the mentioned areas.

With the abolition of internal state borders within the EU and reduced border controls, cross-border crime shows a trend of constant growth.

For these reasons and in order to prevent the spread of crime and increase the efficiency of law enforcement agencies in the fight against crime, the need for increased cross-border cooperation and finding new forms of cooperation has arisen. A novelty in that direction is the introduction of the European Order for Deprivation of Liberty. The foundations for its adoption and introduction are contained in the EU Treaty in the section on police and judicial cooperation.[19] The decision was made and adopted on June 13 2002,[20] and entered into force on January 1 2004. The implementation of the decision, that is, the introduction of the order, became mandatory for the EU member states. In this way, it becomes valid within the EU.

19 EU Treaty in the section on police and judicial cooperation, Area of freedom, security and justice / Police and judicial cooperation in criminal and customs matters / Judicial cooperation in criminal matters; Proposal for a Council framework Decision on the European arrest warrant and the surrender procedures between the Member States

20 2002/584/JHA: Council Framework Decision of 13 June 2002 on the European arrest warrant and the surrender procedures between Member States - Statements made by certain Member States on the adoption of the Framework Decision

With its introduction, long extradition procedures have been overcome. The introduction of the order also meant an increase in mutual trust and cooperation between the criminal law authorities, respect for the principle of mutual recognition of court decisions and the replacement of extradition procedures with surrender procedures between competent judicial authorities.

In relation to the warrant, the order offers other advantages.

The simplification of procedures, decision making by a judicial authority, the inclusion of the request for search and deprivation of liberty, the determination of the measure of detention and surrender, shortening of the entire procedure by determining precise deadlines, eliminating political influences when making the final decisions, reducing the grounds for refusal are part of the advantages.

EXTRADITION

One of the oldest forms of international cooperation between states is extradition, which is undertaken in order to prevent the perpetrator from escaping the jurisdiction of one state by fleeing and hiding in another. Extradition implies submission of a request for extradition or an issued international warrant for a criminal offense for which the suspended sentence cannot be less than 1 year, for the purpose of execution of a valid effective prison sentence or is required to serve a prison sentence of at least 4 months.

SPECIAL INVESTIGATION MEASURES

The prevention and detection of criminal acts is one of the basic activities of the police authorities on the basis of the domestic legislation, that is, the established positive legal regulations. Police activities can have a preventive or repressive character.

The measures and activities undertaken in the pre-criminal investigation are aimed at providing quality and valid evidentiary material for the initiation of criminal proceedings. In this way, SIMs become part of the criminal procedure (Matovski, 2005). The emergence of new forms of crime caused the need to find new tools in dealing with them.

One of the most significant is the introduction and practice of SIMs, which with the legal decisions became an integral part of the criminal procedure, primarily for providing adequate, qualitative and valid evidentiary material. The measures are determined only in cases where it is likely that with other means of evidence it will not be possible to quickly and efficiently provide data and evidence necessary for conducting the criminal procedure (Ilievski et al., 2012).

In dealing with organized crime, SIMs are extremely important and relevant. SIMs represent a special type of operational technique that criminal law authorities use in pre-investigation procedures. As a measure, they are determined after the crime has been committed. Although by their nature they are repressive, they occupy an increasingly important place in modern democratic legislations in dealing with crime. Their legalization is imposed by the awareness that the permanent traditional investigative measures do not have sufficient capacity to oppose the modern forms of transnational organized crime. For these reasons, the modern criminal legislations have introduced new measures, ways and means with the help of which it is considered that they will stand in the way of modern crime. In recent years, SIMs have been determined more often because by their nature they are very suitable for detecting criminal activities. It is considered that they are the result of the previous practices and ex-

periences of the intelligence and security services. The new concept for the action of the police, prosecutorial and judicial authorities was prepared and promoted in the period from 1992 to 1994, when a comparative study was prepared for twelve European countries and the United States for compliance, uniformity and efficiency in application at the Max Planck Institute in Freiburg (*https://csl.mpg.de/en*), Germany of this type of measures in the fight against transnational organized crime. The negative experiences of some countries, the awareness of the world community about the danger of the new type of crime and the readiness and ability of the authorities for their practice are some of the reasons for their legalization. Their determination and implementation require appropriate precise and clear legislation, which will be available to the public. Legal regulation should be transparent, public and accessible to citizens.

The determination of SIMs consciously violates certain human rights and freedoms guaranteed by the Constitution and international documents. Despite this fact, they are legally regulated in the direction of achieving the protection of citizens and society from serious forms of crime and for a successful and efficient fight against it. With their introduction to the bodies of the criminal law authorities, the procedure for the detection and prosecution of the crime is significantly facilitated, especially in the part of providing quality evidential material for a certain period of time. In order to protect certain rights and freedoms of citizens (Jovchevski, 2009), the legal decisions precisely determine the criminal acts, the type of measure, their duration, the authority that determines them, the procedure with the collected material, the authorities that execute them, etc. Before their determination, all possibilities are analysed whether the evidential material can be provided by applying it in another way and by applying another type of measures.

The introduction of SIMs is considered a forced response. Keeping in mind their sensitivity and in an attempt to protect the rights and freedoms of the individual from any possible abuse and at the same time to take advantage of the multitudes offered by SIMs, the legislators in the states and the international community have regulated this issue by passing numerous legal acts. International standards and domestic legal systems should provide clear, unambiguous and practical guidelines as a basis for prosecutions and courts in dealing with requests, approvals, application, control and supervision during their implementation.

The uniqueness of the measures[21] are the reason that they are determined and implemented only by specialized state authorities. In court proceedings, SIMs are considered relatively new, although until their legal regulation and officialization they were known to the public as measures practiced by secret services. In accordance with the legal regulation, the measures are used only in cases where it is really necessary and exclusively for providing evidence and data that cannot be obtained in any other way. Their application implies a violation of the individuals' privacy, that is, they represent a serious threat to individual rights and freedoms, considering that it may disturb their private life. For these reasons, their application should be balanced between the effectiveness of criminal legislation and basic human rights and freedoms. The consistent application of the adopted legal solutions, their normative arrangement and constant upgrading with appropriate laws becomes a necessity. However, in spite of everything, it is considered that their application is less evil than the evil that is threatened by transnational organized crime, that is, that they are a necessary instrument of the bodies of criminal legal prosecution in today's modern societies.

During their determination and implementation, it is necessary to pay special attention to the protection of privacy, the right to the privacy of the home, the right to the protection of letters and other types of communication, as well as the right to the protection of personal data. According to the adopted con-

21 Certain criminal acts, a certain time for their duration, implementation only by certain authorities, determination only by the prosecution or court and others.

clusions contained in the Resolution of the XVI Congress of the International Association for Criminal Law held in Budapest, 1999,[22] their application implies respect for certain principle.[23] The principles are confirmed and upgraded by other acts of international organizations - UN, EU and others.

FUGITIVE ACTIVE SEARCH TEAM (FAST)

Finding fugitives from the law is of particular importance for the successful conduct of criminal proceedings or the execution of imposed criminal sanctions. Despite the use of the benefits of new techniques and technologies by the criminal prosecution authorities, finding fugitives from the law is difficult. The unlimited opportunities for constant mobility of criminals often beyond state borders, reduced border controls, new forms, means and methods used by fugitives from the law to avoid criminal prosecution require an appropriate response from the criminal justice authorities. For these reasons, the search for persons requires a multidisciplinary approach, efficient and immediate mutual cooperation.

In order to achieve greater and more efficient cooperation between the competent authorities for finding fugitives from the law within the EU during the presidency of Belgium, in 2010, the idea was born for the establishment of national teams for the active search for persons - FAST and the European network of teams for the active search for persons - ENFAST within the framework of the national police authorities in the Union.[24] In countries where there are no conditions for the establishment of such teams, it is recommended to establish a single point of contact for active search for persons.

The introduction of the issued international notices through the channels of Interpol and the European arrest warrant served as a legal framework for the functioning of such teams.

Operationally, the teams act and coordinate measures and activities on the territory of their country. Using the opportunities offered by new technologies is considered the greatest benefit and recognition of the teams. FAST teams are used to locate, find and detain fugitives only for certain crimes.[25]

ENFAST

In order to achieve the goal in cases where there is an active search for persons, the establishment of an informal network for finding, locating and depriving the person of liberty was also foreseen. The ENFAST network is composed of national contact points for cooperation in the field of international tracing within the Union. The network enables the availability of search teams practicing the principle of operation 24/7. By enabling direct and rapid collaboration with special teams, it makes the network unique, and team members are considered experts in their field.

22 XVI International Congress of Penal Law, Budapest, 5 – 11 September, 1999, Section III, p.10

23 Legality, subsidiarity, proportionality, obtaining consent from the court.

24 In 2010 at a fugitive's conference attended by 24 national fugitive teams of the European Union, an initiative was put forward to create a European network of national fugitive teams, named ENFAST. This initiative was adopted by the European Council on 1 January 2013. The Belgian FAST took the first Presidency for a two-year period (2013-2014). After German FAST having continued the project under its Presidency for another two years (2015-2016), Dutch FAST took over the Presidency for 2017 to 2018, followed by FAST Croatia (2019-2020) and currently FAST Spain (2021-2023) ensuring the continuity of the project.

25 Article 253, Code of criminal procedure

Basically, the network should enable more efficient and immediate international cooperation and coordination in cases involving teams. At the same time, it should contribute to raising public awareness that its formation and activity will increase security in the Union.

Five years after the establishment and operation of the network within the EU, it was established that the wanted fugitives from the law in a large number of cases are outside the borders of the EU. For these reasons, the reception of FAST teams from third countries was made possible, which expands the network to non-EU countries with observer status and non-voting rights. Such an approach does not reduce the possibility of deepening mutual cooperation.

RESEARCH

Dealing with modern forms of crime is a constant challenge for law enforcement agencies. Without the application of SIMs, it is difficult to discover and provide quality evidence. Their determination is only in cases where it is not possible and efficient enough to provide evidence and data for the successful conduct of criminal proceedings with other means of evidence.

Following the development of the modern democratic legislation and the experience of the EU member states, the CCP of the Republic of Macedonia from 2004 incorporated the SIMs in the section of the previous - pre-investigation procedure.[26] The incorporation of the measures was made possible by the constitutional amendments late in 2003 especially with Amendment 19 of the Constitution of the Republic of Macedonia Article 146 states the conditions for determining eight SIMs.[27]

Pursuant to Article 271 of the CCP the Public Prosecutor of the Republic of Macedonia[28] is obliged to submit a Report to the Parliament of the Republic of Macedonia on SIMs for the previous year once a year. The data contained in the reports are defined in the same article.

According to research and analysis of the reports, the statistical data on the number of cases and the number of persons against whom the measures have been implemented, by type and by crime, it appears that they cannot be analysed individually as a general set of figures, because in practice most often the measure is not applied only on one basis, but it is combined with multiple types of SIMs.

For these reasons, the research will cover the period 2019-2021 and will pay special attention to the data on the total number of cases, the number of persons and objects covered, the type of measures that were most often applied and the crimes for which a certain measure was determined in the largest number of cases. The data are provided by the publicly available reports for the relevant reporting period prepared by the Republic of Macedonia and submitted to the Parliament of the Republic of Macedonia.

It should also mention the fact that there have been some difficulties in the analysis of the data due to their inadequate presentation, that is, that part of the data refers and is presented only to the number of cases or to the number of persons covered, some to both. The reports do not contain more detailed data on the determined measures for the subjects for which they were determined. For these reasons, only the total number of cases, persons and objects for which the measures were determined will be used in the research.

26 Purified text - Official Gazette of the Republic of Macedonia number 15/05 of 07 March 2005

27 https://www.sobranie.mk/content/Odluki%20USTAV/Odluka%20za%20proglasuvanje%20na%20amandmanot%20XIX%20na%20Ustavot%20na%20RM.pdf

28 Official Gazette of the Republic of Macedonia No. 150/2010 of 18 November 2010

Given that it is an introduction of a relatively new measure that has been practiced for a short time, and the analysed period coincides with the Covid crisis and the period for which reports are provided for only this period, the reasons for the increase/decrease will not be analysed and commented on.

Pursuant to Article 252 of the Criminal Procedure Code, when it is likely that data and evidence necessary for the successful conduct of criminal proceedings that cannot be collected in any other way will be provided, the following SIMs can be taken: point 1 – monitoring and recording of telephone and other electronic communications in a procedure determined by a separate law; point 2 – monitoring and recording of a home, a closed or fenced area belonging to that home or business premises designated as private or in a vehicle and entry into those premises for the purpose of creating conditions for monitoring communications; point 3 – secret monitoring and recording of persons and objects with technical means outside the home or business space marked as private; point 4 – secret inspection and search in a computer system; point 5 - automatic or otherwise search and comparison of personal data; point 6 - inspection of telephone and other electronic communications; point 7 – simulated purchase of items; point 8 - simulated giving and receiving bribes; point 9 - controlled delivery and transportation of persons and objects; point 10 – using persons with a hidden identity for tracking and collecting information or data; point 11 – opening a simulated bank account; point 12 – simulated registration of legal entities or use of permanent legal entities for data collection.

Table 1. *Special Investigation Measures*[29]

Year	Number of cases	Persons with confirmed identity	Persons with unconfirmed identity	Subjects
2019	103	338	17	313
2020	67	404	22	124
2021	59	204	11	126

The data contained in the reports[30] indicate the finding that the number of cases for which a SIM is determined is constantly decreasing compared to 2019, by 35% in 2020 and by 43% in 2021.

In contrast to the data on the cases, the situation with the number of persons with established identity covered by a SIM in relation to 2019, 2020 records an increase of about 20% while there is a decrease of 40% in 2021.

For persons with undetermined identity, the situation in relation to 2019 indicates an increase of about 30% in 2020 and decrease by 35% in 2021.

There are almost no other data in the reports about the cases that were subject to SIMs. From the data contained in the reports, it can be concluded that in relation to 2019, in 2020 and 2021 the number of cases decreased by 60%.

The data on the number of persons with established identity and the number of cases in 2019 are characteristic. They are almost identical so that ratio in the analysed period shows a decreasing trend.

29 The year 2019 was taken as a basis for comparing the data.

30 https://jorm.gov.mk/izveshtaj-za-primena-na-posebnite-istrazhni-merki-vo-2022-godina/

Table 2. *Number of Cases and Information Exchanged*[31]

Year	2020		2021		2022	
Police organization	Number of cases	Messages	Number of cases	Messages	Number of cases	Messages
Interpol	1,447	151,951	1,555	181,787	1,429	177,423
Europol	268	3,476	270	3,290	254	4,049
SELEC	42	/	60	/	53	5,913
Liaison officers	128	/	122	618	151	/
Total	1,885	155,427	2,007	185,695	1,887	187,385

The analysis of the data will have the status of cases and messages in 2020. The data on the total number of cases by year lead to the conclusion that in the researched period there is a slight increase of 6% (2021) or about 2% in 2022, while the number of sent messages increases by 20% in comparison with both 2021 and 2022.

If the number of member countries is taken into account, Interpol as the largest police organization in the world during the researched period, in the total number of cases it constantly participates with about 76%, while in the total number of messages it participates with 95% (2022), i.e. 98% (2020 and 2021)

Taking into account the fact that Europol mostly carries out its activities within the EU member states, the representation in the total number of cases per year is about 13.5%, while in the total number of messages it is about 2%.

CONCLUSION

Criminal activities of any kind are prohibited by law because they threaten the property and integrity of people and values, and the functioning of the social community, that is, they threaten national security or directly undermine the foundations of statehood and the state.

Organized crime continues to be a special form of professional crime that is organized and acts on the basis of its own norms and standards, ways of behaviour, firm organization, hierarchical relationship. Today, most often organized crime is both organized and specialized for the execution of a certain type of criminal act.

Even today, control over crime can hardly be established although intensified measures to reduce it are taken and promoted at the highest level. Its suppression requires a serious and multidisciplinary approach and organized action of all those who are in charge. New forms of organized crime constantly require a new approach. In that direction, strategies are adopted, agencies and other special bodies are formed. Organizational problems, insufficient staffing, without adequate financial, material and other types of support and other problems are the reason that they are not able to fully perform their activities.

Often times, their reports about the established conditions are not given sufficient and serious attention. The ambiguities and inaccuracies in some legal solutions are the reason for their different interpretation and contribute to the spread of criminal activities. Court practice suggests that the

31 https://mvr.gov.mk/Upload/Editor_Upload/Godisen%20izvestaj/%D0%93%D0%BE%D0%B4%D0%B8%D1%88%D0%B5%D0%BD%20%D0%B8%D0%B7%D0%B2%D0%B5%D1%88%D1%82%D0%B0%D1%98_2022_%D0%9C%D0%92%D0%A0.pdf

absence of quality evidentiary materials causes long court proceedings, which favours the organizers, especially the organized crime.

Aiming the activities against the consequences of crime and not towards its suppression is considered as their shortcoming.

Successful dealing with the organized crime implies an independent judiciary, transparency of government institutions, cooperation between different national agencies, and training of the persons dealing with it.

Bearing in mind that it is a global problem faced by all states and the entire international community, a problem for which there are no state borders, the harmonization of domestic legislation with the international, the constant adjustment and harmonization of legislation and institutions in accordance with the new conditions, strengthening of capacities and providing adequate resources to all involved in dealing with it are part of the measures for successfully dealing with organized crime.

PROPOSAL OF MEASURES

Dealing with crime is becoming an increasingly difficult and complex task for law enforcement agencies. The fact remains that crime cannot be completely eliminated. The crime situation points to the fact that there is still no state that can stand up to crime on its own and that the independent activation of any institution, measure and activity in today's conditions cannot produce the expected results. Until the terrorist attacks in the USA on 11 September, 2001, it was considered that international cooperation of any kind was ineffective, inadequate, inconsistent and inappropriate. Reluctance and mistrust were one of the reasons for such cooperation.

The fact that certain institutions act and instruments are practiced only regionally and that there are still countries that have not fully or partially incorporated them into their legislation should be added to such situations with crime and international cooperation.

It has been proven that the application of traditional approaches and methods in dealing with new types of crime have proven to be insufficiently effective. The international community still cannot find an adequate and effective response to crime. For these reasons, finding new solutions remains a top priority. New forms of crime as a complex problem require a wide range of activities at the national, regional and international level. In that direction there is constant search for relevant legal bases for acting and initiating measures and activities for their practical implementation.

Defining and creating a global system to combat transnational organized crime is one of the models for dealing with it. International cooperation becomes a necessity and the only organized response to crime. Only well-organized, direct and permanent cooperation between justice and internal affairs agencies supported by effective and efficient international instruments can successfully and efficiently confront and deal with crime. The expansion and promotion of international cooperation, the increase of mutual trust should become everyday task. Acceptance of effectively proven practices in a certain region[32] should be legally regulated on a wider international level. The opportunities offered by the existing instruments for objective or subjective reasons are not yet sufficiently used. The constant review of the existing legal acts at the national level and their adjustment with the international ones should be the focus of the legislator.

32 EU: EAW, FAST and ENFAST, SIM

It should be stated at the end of the paper that today the two most famous police organizations in the world are Interpol - which carries out its activities in the member states and Europol - which operates within the EU. Both organizations use their own instruments, each with their own disadvantages and advantages over the other. The Interpol Red notice is used by the member states, and the EAW is used by the police organizations of the EU member states. FAST and ENFAST operate within the EU, and a number of special agencies have been established in the area of security and justice.

Regarding the practice of SIMs on a wider international level, there are still no single standards for their determination and use. In addition to this, the data contained in Table number 5 indicate the fact that Interpol participates in the total annual number of cases with 76%, and in the total number of messages with a high 95%, while the participation of Europol in the total number of cases is 13.5%, and in the number of messages a minimum of 2%.

The stated facts indicate that the existence of several police authorities tasked with dealing with crime reduces effective and efficient international cooperation. The reduction of mutual differences and the utilization of the proven positive effects of some cooperation instruments, that is, the reduction of differences from some other instruments will make international cooperation more effective and efficient.

Let this paper be an introduction and an incentive for further research on the topic in order to find more effective solutions for successfully dealing with crime and its perpetrators.

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THE DISTINCTION BETWEEN THE OFFENCE OF MASS DISORDER AND THE OFFENCE OF HOOLIGANISM

Ana-Maria Chepestru, PhD Student[1]
Legal Directorate of the Ministry of Internal Affairs of the Republic of Moldova

Chapter XIII of the Criminal Code of the Republic of Moldova (will still be used – Criminal Code) distinguishes different offences, which directly harm this social value. It is specified that, taken as a whole, the offences in this category are very similar, but a close examination of the many details that characterise them reveals essential differences between them. It is precisely these differences that give these offences their particular character, making it possible to classify violations of public security and public order in the correct legal sense. The present research aims to draw a parallel between two offences in the same field, namely a comparative study between the offence of mass disorder and the offence of hooliganism.

It is mentioned that the act of mass disorder is criminalised in Article 285 of the Criminal Code and the act of hooliganism is criminalised in Article 287 of the Criminal Code. In view of the content of the articles mentioned above, it should be noted that the procedure for distinguishing between the two offences must be based on certain criteria, in the order of the following considerations.

1. The first distinction between the offences under consideration will be examined in terms of their legal or, where appropriate, doctrinal concepts. Article 287 of the Criminal Code expressly defines the concept of hooliganism, but in Article 285 of the Criminal Code, the lawmaker proceeds directly to criminalise the three typical variants of mass disorder. According to Article 287 paragraph (1) of the Criminal Code, hooliganism is defined as intentional actions that violate public order, accompanied by the infliction of violence on persons or the threat of such violence, the violent resistance to representatives of the authorities or other persons who suppress the hooligan acts, as well as actions which, by their content, are distinguished by a special naughtiness.

Since the notion of mass riots is only understood at the level of doctrine, it is pointed out that the literature argues that mass riots are a negative social phenomenon, which materializes in the expression by society of negative opinions towards the activity of the authorities representing state power. As a rule, mass riots involve criminal activity on the part of a mob of people and are carried out by a mass violation of public order. In such a situation, the conditions are created for an attack on the material legal object of the offence, in this case the person's body and property.

2. The second criterion for distinguishing the offences of mass disorder and hooliganism is the object of the offence, which is similar for both. The offences mentioned are covered by Chapter XIII of the Criminal Code, their generic legal object is social relations in the field of public order and security. In general, the specific legal object of these offences is considered to be identical and is public order and security. At the same time, it is noted that the special legal object of the predicate offences is of a complex nature, respectively it includes both primary and secondary legal objects and is common to both offences. The special secondary legal object is represented by the social values that protect the health and physical integrity of persons and the fullness of their property.

1 anamaria.1996@mail.ru

It is specified that some scholars mention that public security in essence differs from public order, supporting the theory that the offence of mass disorder provided for in paragraph (2) of Article 285 of the Criminal Code is a genuine act intended to harm public security, but not public order. In contrast, the offence of hooliganism is an attack on social relations organically linked to public order, but not to public health. In fact, hooliganism is the classic example of an offence against public order. Public security is the state of affairs inherent in a group of individuals or an entire community, designed to ensure peace in society and the necessary protection of all the rights and interests of the members of the group or the community as a whole against various unlawful influences from within or outside. Compared to public order, public security is affected by large-scale, high-profile acts, and it is precisely such acts that can affect the security of an entire society (community), but not of an individual person (Copețchi, 2020: 33).

As regards the material object of the specified offences, it is stated that it is similar for both offences and that it is the person's body or movable or immovable property.

In terms of the affected rights, it is pointed out that in the case of both offences the victim may be representatives of the public authorities. It follows from judicial practice of the Republic of Moldova that a representative of a public authority means the representative of the interests of any central or local public authority (Decision of the Plenum of the Supreme Court of Justice of the Republic of Moldova No. 11/2012).

With reference to the victim of the crime of mass disorder, it is stated that representatives of the authorities can be victims of the crime only when the perpetrator's actions are accompanied by violent or armed resistance to these categories of persons.

In the case of the offence of hooliganism, a further category of victim is defined as the person who actively suppresses the hooligan acts by taking measures to stop the unlawful acts, detain the person committing them or take other action to combat the criminal activity. This does not include persons who merely criticise, reprimand or otherwise passively express their disagreement with the hooligan acts.

Generally, in the case of hooliganism, the perpetrator's energy is directed towards a specific victim or victims who form a specific circle of people. In the case of mass disorder, not only representatives of the authorities but also other participants in the disorder, including non-participants and bystanders, are exposed to danger. From this perspective, mass disorder is similar to terrorism, which also involves the presence of potential (incidental) victims other than those targeted (Copețchi, 2020: 34).

In relation to movable or immovable property, it is noted that this may constitute the material object of both offences under consideration. In the case of mass disorder, movable and/or immovable property may be damaged by the use of firearms or other objects used as weapons, arson and other dangerous objects. In the case of hooliganism, it may be a material object if it is taken unlawfully and gratuitously for hooligan reasons, in order to extort the victim and not for the perpetrator's final possession. In this case, the unlawful and gratuitous taking of foreign property appears as a factual way of violating public order or as a manifestation of particular impudence (Brânză & Stati, 2015: 647).

It is pointed out that both in the case of hooliganism and mass disorder, movable and/or immovable property may have the status of a material object when it is damaged or destroyed. An exclusive condition arises in the case of hooliganism, respectively that the deterioration or destruction of the of the property constitutes a manifestation of a breach of public order and security or of particular impudence.

Although the difference seems to be non-essential, it is difficult to distinguish mass disorder from hooliganism involving the destruction or damage of property. From the provision in paragraph (1) of Article 285 of the Criminal Code shows that destruction or damage to property often takes specific forms during mass disorder: pogroms, arson or other similar actions. This means that, unlike hooliganism, the mass riots imply a higher probability that dangerous means will be applied to the life and health of several persons (for example: flammable substances, explosive charges and others) (Brânză, Stati, 2015: 583).

3. The objective aspect of the offence is another criterion for defining the offences analysed. Thus, it is clear from the text of the law that the two criminal offences are undeniably different in their objective aspects. It should be noted that Article 285 of the Criminal Code criminalises three typical variants of the offence of mass disorder, as follows:

1) organising or leading mass riots, accompanied by the use of violence against persons, riots, arson, destruction of property, the use of firearms or other objects used as weapons, and violent or armed resistance to representatives of the authorities;
2) active participation in the above actions;
3) calls for active violent disobedience to the legitimate demands of representatives of the authorities and for mass disorder and acts of violence against persons (Criminal Code of the Republic of Moldova - ZIP, Official Monitor of the Republic of Moldova, No. 985/2002).

It is pointed out that the commission of at least one of the three standard variants of the offence is sufficient for the existence of the criminal offence. The lawmaker has also ruled out the possibility of the offence in question being committed in the presence of aggravating circumstances. No less important are the obligatory actions accompanying the criminal act of mass disorder, which are of major importance in the process of its legal classification, which is why it is judicious to explain their significance.

The term "pogrom" is understood as a spontaneous group attack, manifested by beatings, harassment, damage or devastation of property, means of transport, buildings and others.

The term "arson" implies the deliberate ignition of a fire by means of a physic-chemical process, using various substances.

The term "destruction of property" refers to the partial or total destruction of material objects which, due to their poor condition, can no longer be used for their original purpose.

The term "application of firearms or other objects used as weapons" is explained under the aegis of Article 2 of Law No 130/2012 on the regime of weapons and ammunition for civilian use, which provides that a firearm is a portable barrelled weapon that can throw, is designed to throw or can be converted to throw buckshot, a bullet or a projectile by the action of a propellant (Law on the regime of weapons and ammunition for civilian use, Official Monitor of the Republic of Moldova, No. 130/2012).

The term "other objects used as a weapon" includes objects with which the victim has caused or could have caused life-threatening injuries (knives, including kitchen knives, kettles, axes, spears and others), as well as objects intended to temporarily disorientate the victim, such as revolvers, spray and other poison gas devices. It is specified that the use of dogs or other trained animals that present a danger to the life or health of the person being assaulted, or with the threat of their use, falls within the scope of this concept (Decision of the Plenum of the Supreme Court of Justice of the Republic of Moldova No. 12/2014)

In the case of armed resistance to the law enforcement authorities, the weapon is considered the only means of committing the criminal act.

In another sense, it is noted that Article 287 of the Criminal Code incriminates the following alternative normative modalities, namely:

1) actions committed with intent, which violate public order and are accompanied by the application of violence to persons;
2) actions committed with intent, which violate public order and are accompanied by the threat of violence against persons;
3) intentional actions, which violate public order and are accompanied by violent resistance to representatives of the authorities or other persons curbing hooligan acts;
4) actions which, by their content, are distinguished by particular impudence (ZIP, Official Monitor of the Republic of Moldova, No. 985/2002).

At the same time, in the case of hooliganism, the lawmaker admits the following aggravating circumstances:

a) by a person who has previously committed an act of hooliganism;
b) by two or more persons;
c) on the territory or in the premises of a public or private medical institution;
d) against a doctor or medical worker in the exercise of his duties;
e) on grounds of prejudice (ZIP, Official Monitor of the Republic of Moldova, No. 985/2002).

In this respect, it is appropriate to clarify the terms which directly form the objective side of the offence of hooliganism. Bullying accompanied by resistance to representatives of the authorities or other persons who are curbing the acts of intimidation has been explained in terms of the categories of victims described above.

The term "hooliganism accompanied by particular insolence" is understood to mean acts of violation of public order accompanied by acts of violence against the person, destruction and degradation of the owner's property, temporary interruption of the normal activity of companies, institutions or organizations. Based on the provisions of criminal law, the courts of the Republic of Moldova will distinguish three forms of hooliganism, liable to criminal responsibility, namely:

1) simple hooliganism, which is provided for in Article 287 paragraph (1) of the Criminal Code;
2) aggravated hooliganism, which is provided for in Article 287 paragraph (2) of the Criminal Code;
3) aggravated hooliganism, if this act is committed with the application or attempted application of a weapon or other objects to harm physical integrity or health and is provided for in Article 287 paragraph (3) of the Criminal Code (Institutul Naţional al Justiţiei, 2019: 241).

As a result of what has been described, it is clear that both mass disorder and hooliganism include actions accompanying the basic offence, without which legal classification under Article 285 of the Criminal Code or under Article 287 of the Criminal Code would be impossible.

In the content of both incriminating rules, it is pointed out that the legislator operates with the wording "infliction of violence against persons", but does not specify the type of violence inflicted. In the case of hooliganism, the position of the Plenum of the Supreme Court of Justice of the Republic of Moldova sheds light, as it explains that violence is limited to causing minor or slight harm to the physical integrity or health of persons. As regards the violence applicable to the offence of mass disorder, certain inaccuracies are identified, since the content of the criminal law does not expressly state the type of violence applied (non-hazardous and dangerous to life or health) or its limits, and the analysis of judicial practice in this regard leaves room for an extensive interpretation.

Taking into account the similarities and differences between the objective sides of hooliganism and mass riots, it is concluded that in both cases, the commission of the crime is materialized including by resisting to representatives of the authorities. Although at first sight this appears to be similar, it is pointed out that the resistance of representatives of the authorities is different for each offence. In the case of hooliganism, resistance to representatives of the authorities is exclusively of a violent nature, whereas in the case of mass disorder it is both violent and armed.

Due to the similarity of the offence's components, there is a risk of inaccuracies with regard to the delimitation of the qualification of active participation in mass disorder (Article 285 paragraph (2) of the Criminal Code) and hooliganism committed by two or more persons in a public place (Article 287 paragraph (2) point b) of the Criminal Code) because the prosecution may encounter difficulties and uncertainties in assessing the nature of the committed offence. The components of the offence mentioned are distinguished in terms of quality and quantity. Thus, in the case of mass disorder, the quality aspect refers to the sole purpose of the crowd of people in committing the illegal acts, respectively to destabilise political, social and economic areas, weaken certain branches of activity, undermine public order and security and others. The quantitative aspect is based on the large number of people participating in the commission of mass disorder. Article 285 paragraph (2) of the Criminal Code implies in itself the involvement of a large number of participants. By comparison, it is noted that hooliganism does not involve the participation of a crowd of people, but is reduced to a group consisting of a small number of people.

By analogy, there are cases in international criminal law where the exact minimum number of persons participating in the criminal activity is determined for it to be considered a crime of mass disorder. Although the number of persons participating may be relative from case to case, it is considered irrelevant to regulate this fact in the content of Article 285 paragraph (2) of the Criminal Code.

In the part referring to the type of offence, a similarity is clearly established, since both mass disorder and hooliganism have a formal component, or they are consummated from the moment of the commission of at least one of the normative modalities of the offences, and it is not necessary for the harmful consequences to occur. The optional signs of the objective side (place, time, methods, means and circumstances of the offence) may in some cases be of major importance in the process of classifying the offence. In the case of mass disorder, the place where the offence is committed is a distinct public place allocated to the general public, whereas hooliganism does not necessarily have to be committed in a public place, but the public manner in which the offence is committed is essential, so as to ensure either the presence of the public or the subsequent information of persons about the consequences of the hooligan acts.

The time of the commission of the offences set out in Articles 285 and 287 of the Criminal Code are not indispensable for the legal classification of the offences in question, because the commission of the offences analysed does not depend on the season, calendar date, weekday, periods of the day (day, night) or hour.

With regard to the means of committing the offences, it should be noted that in the case of the criminal activity referred to in Article 285 paragraph (3) of the Criminal Code, indirectly it can be committed by a wide range of means, for example sending messages, posting advertisements, informing via social networks and other modalities. As these can be diverse and the criminal can use any means to commit the offence, they are not relevant to the qualification of the offence.

For committing the offence of aggravated hooliganism specified in Article 287 paragraph (3) of the Criminal Code, it is mandatory that the perpetrator in the process of committing hooliganism applies

or attempts to apply the weapon or other objects to harm bodily integrity or health. The application or the intention to apply in the commission of hooliganism firearms, knives or various bladed weapons, as well as other objects, including those specially adapted for bodily harm, shall serve as a basis for the qualification of the offence under paragraph (3) of Article 287 of the Criminal Code not only in cases where the perpetrator causes or intends to cause bodily harm by means of them, but also when the use of the aforementioned objects in the process of hooligan acts creates a real danger to human life and health (Pilat, 2018: 28).

As regards the consequences, methods and circumstances of committing mass disorder and hooliganism, it is stated that these are not relevant to the legal classification of these offences.

4. Another criterion for differentiating the two offences will be the subject of the offence. From the outset, the possibility of the offences in question being committed by a legal person is ruled out. From the analysis of Article 21 paragraph (2) of the Criminal Code, it is noted that the subject of the offence under Article 285 and the offence under Article 287 paragraph (2) and (3) may be a person, responsible one, who at the time of the commission of the offence has reached the age of 14 years. At the same time, it is indicated that the subject of the offence under Article 287 paragraph (1) is a responsible person who has reached the age of 16 years at the time of the commission of the offence.

5. The final criterion for the definition of research offences is the subjective aspect, which in both cases takes the form of direct intent. In the case of hooliganism, the perpetrator acts out of a hooligan motive, which may be based on a negative emotion, accompanied by an emotional outburst, apparently without any particular reason, without any pretext, or based on a trivial or invented pretext. The motives for hooliganism can also be manifested in a sense of terror, anger, self-assertion, the phenomenon of committing crimes for amusement and other reasons. In the case of mass riots, the motive is different. This may be: disapproval of state policy, dissatisfaction with the way of life, dissatisfaction with a particular public authority and others. Similarly, in hooliganism, as a rule, the perpetrator does not seek to demonstrate his hostile attitude towards public authorities or their representatives by committing the hooligan act, but rather his terrible attitude towards society (Copețchi, 2020: 35).

Essentially, mass riots are the actions of masses of people, used by interested individuals as a *sui generis* tool to achieve their goals, taking into account the psychology of the crowd and channelling its scientific conduct in the desired direction. In the case of mass riots, property is destroyed or damaged, attacks are made on individuals, the functioning of public authorities is paralysed and transport is blocked. In other words, it is the scale of what is committed that distinguishes mass disorder from hooliganism committed by two or more persons (Article 287 paragraph (2) point b) of the Criminal Code). Unlike mass disorder, hooliganism cannot be committed by a few dozen, hundreds or even thousands of people. This is even though mass riots can develop from an act of hooliganism, an act that attracts more and more participants in terms of quantity and quality, thus crossing the line between hooliganism and mass riots (Brânză & Stati, 2015: 582).

The circumscribing lines of the offences under investigation are also used to identify how the criminal acts under investigation were committed. Thus, it is stated that hooliganism is usually spontaneous, respectively it does not require the preparation stage of the criminal activity (it is committed in the form of simple participation), which is practically the opposite of the offence of mass disorder, which is premeditated. In the case of mass disorder, the stage of preparing the crime is important, which takes the form of dividing up roles and establishing the means and instruments for committing the offences.

CONCLUSIONS

Finally, the legal-criminal analysis of offences should not be limited exclusively to identifying and describing the constituent elements and signs of the offence, because this analysis is limited by theoretical explanations. A better understanding of the legal-criminal structure of offences is undoubtedly only possible through the comparison of the components of offences, since even the smallest legal-criminal aspects are examined in detail. The differences identified and described between the offence of mass disorder and the offence of hooliganism are of major importance for the legal classification of the examined offences.

Furthermore, it is reported that in practice there may be situations where even the perpetrator in the process of committing one of the offences under consideration may change his sole intention and adjust his attention to another purpose. For example, it is likely that, while participating in the offence of mass disorder, the perpetrator will also commit a hooligan act, which is to be qualified under Article 287 of the Criminal Code, only if it would be manifested by particular impudence. At the same time, the opposite situation is noted, respectively where, during the commission of a hooligan act, the perpetrator has the intention of committing mass disorder. Only the correct identification, through the comparative prism of the objective and subjective aspects of the offence will ensure the correct determination of the harmful act, with its subsequent legal classification in a precise manner.

This research contributes to facilitating the work of the prosecution authorities and the courts, since the differentiation criteria addressed in the content of the work are decisive in determining criminal liability and criminal punishment. The main purpose of this study is to support the process of justice by highlighting some advisory ideas on the delimitation of two similar offences in terms of their composition and the specificity of their legal object.

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PROSECUTION OF HATE CRIME AND HATE SPEECH IN BOSNIA AND HERZEGOVINA

Marija Lučić-Ćatić, PhD[1]
Muamer Kavazović, PhD
Edita Hasković, PhD
Faculty of Criminal Justice and Security Studies, University of Sarajevo
Bosnia and Herzegovina

WHY IS ADEQUATE RESPONSE TO HATE SPEECH IN B&H ESSENTIAL?

In recent years, the prevalence of hate speech and hate crimes has become an increasing concern across European societies because of their poisonous effects on the very foundation of the society. Those phenomena threaten individual rights, human dignity, and equality, strengthen tensions between social groups, disturb public peace and public order, and endanger peaceful reconciliation of the communities (Bayer *et al.,* 2020).

In the Western Balkans (WBs), hateful narratives are particularly threatening because the dynamics of hate speech in the WBs are complex and multifaceted. Even though, hate speech mainly targets members of vulnerable and/or minority groups, in the WBs it is also used to fuel the old tensions between the different ethnic, national and religious groups. It is present in everyday life, in political debate and in media (Lučić-Ćatić, 2023). When or if (ab)used by political figures, it *"directly normalises and reinforces hatred and violence in society"* and can lead to reciprocal radicalisation (European Parliament Resolution of 25 October 2018 on the rise of neo-fascist violence in Europe). Inadequate response on hate speech and hate crime directly affects peace building, transitional justice and good neighbouring relationships in the WBs region and can disturb WBs EU accession processes.

In the Bosnia and Herzegovina (hereinafter: B&H) hate speech and hate crimes are particularly dangerous because of their substantial potential to increase the existing tensions and negatively affect the trust building process as well as genuine recovery of the whole society from the past conflicts. Namely, the legacy of the war in the nineties of the last century, the lack of consensus on the narratives of the past, the existing fragmentation of the society, the dominance of collective identities, constant disagreements between ethno-national political elites, the media propagating intolerance and hatred, etc. fuel occurrence of hate speech and hate crime and halt democratic processes and B&H's path to a fully democratic and functioning society (Sokol, 2020: 4; Lalić, 2014; Šinković, 2022). The manifestation of hatred is evident in all areas of B&H's reality. Sports events, especially football matches represent a kind of the arena for the expression of national animosity. Hate messages and acts may be found in politics, on the web, sports events, in the cultural landscape, in urban and rural, ethnically homogeneous, and heterogeneous environments (Blagojević, 2010; Palmiotto *et al.*, 2012; Sokol, 2020; Brković *et al.* 2022).

1 mlucic@fkn.unsa.ba

This omnipresence of hatred leads to its normalization to a very significant extent (Resilience, 2021). Unfortunately, this normality is not only a question of public opinion since the current legislation and judiciary practice show similar attitude (Lučić-Ćatić, *et al.,* 2016).

Considering the role that hate speech played in the dissolution of the former Yugoslavia and war in B&H, the significance that ethnocentric rhetoric and aggressive nationalism now poses to the peace and security in B&H should not be underestimated (De Sanctis, 2004). Present historical antagonisms of multinational and multi-confessional society, social polarization and fragmentation, the legacy of the war with its objective and subjective consequences makes B&H's society particularly sensitive to hate speech and incitement to hatred. Even though many years have passed since conflict, its influence on the symbolic level does not descend (Lalić, 2014). The fact that high level of hate speech is based on ethnicity, related to religion, politics and 90s war, indicates that B&H society has not moved far from the post-war narratives and that is still a very suitable social environment for incitement to hatred and even radicalization (Gračanica, 2022).

Hate speech is inevitable part of media discourse as well as politics. B&H's media are often generators of hate speech and hateful narratives where hate narratives are not isolated cases of specific individuals but rather results of devised campaigns that use different methods, such as biased reporting, mis/disinformation and spread of fear. The mainstream media in B&H are the sources and disseminators of hate narratives towards specific groups and individuals, which are further popularized through user-generated comments (Sokol, 2021). Even when the mainstream media does not produce hate speech narratives on its own, they become a means for transferring them (Londo, 2021). Namely, a deeply ethnically divided society, where the media either lacks political independence, promoting the narratives of powerful actors, or where critical independent media is seen as an enemy of the system, is a fertile ground for hatred and its devastating effects (Gračanica, 2022).

The situation is additionally complicated by the presence of hate speech in political discourse since it normalizes and reinforce hatred and violence in society (European Parliament Resolution of 25 October 2018 on the rise of neo-fascist violence in Europe). As stated in the results of Resilience' research Hate Narratives in the Western Balkans and Turkey (2020: 20): *'In many cases, hate narratives are clearly politically orchestrated, and mainly disseminated through media affiliated with the leading political parties. While the hate narratives identified in the research are not new, they have now been normalized to a very significant extent. Rather than being consistently condemned, they are often instrumentalized for political campaigns and increasingly seen as a regular part of public discussion*'. Hate speech and hateful narratives are used to mobilize support for nationalist and exclusionary ideologies targeting specific ethnic or religious groups and to dehumanize and delegitimize these groups, making them vulnerable to discrimination and violence. This phenomenon leads to the perpetuation of discrimination and violence against targeted groups, and it can also radicalize society in a manner that can lead to violent extremism, since the usage of hate speech is a frequent starting point for radicalization (Buljubašić, *et al.,* 2021).

All the aforesaid reveals exceptional danger that normalization, wrong perception, and inadequate judicial response to hate speech and hate crime present in B&H's context. It is recognized that across the region, and in B&H, there is hesitancy within the judiciary to process hate speech and to consider the hate towards particular social groups as an exacerbating factor in criminal offences (Hrvatin, *et al.*, 2021). In B&H current legislation enables prosecution of both, hate crime and hate speech but with certain overlaps in provisions that can lead to misunderstanding of concepts of hate crime and hate speech and consequently to inadequate judicial response to those harmful behaviors.

CONCEPTUAL DEFINITIONS OF "HATE SPEECH" AND "HATE CRIME"

Despite the frequent usage of terms hate speech and hate crime there are no universally accepted definitions of those phenomenon. Because of that, of their nature, and existing legal provisions they are often misunderstood and overlapped even though they signify different legal concepts of damaging behavior and they do not raise the same apprehensions for the right to freedom of expression (Responding to Hate Speech against LGBT people, 2013).

Experts and practitioners on international level have offered variety of hate speech definitions and most states have passed provisions and/or laws prohibiting it, with a slight difference when determining what is being prohibited (Weber, 2009). Namely, hate speech covers many forms of expressions which advocate, incite, promote, or justify hatred, violence and discrimination against a person or group of persons for a variety of reasons (Guillén-Nieto, 2023).

Operational definition is offered by the Council of Europe's Recommendation of the European Commission against Racism and Intolerance (hereinafter: ECRI) that defined hate speech as: *'advocacy, promotion or incitement, in any form, of the denigration, hatred or vilification of a person or group of persons, as well as any harassment, insult, negative stereotyping, stigmatization or threat in respect of such a person or group of persons and the justification of all the preceding types of expression, on the ground of race color, descent, national or ethnic origin, age, disability, language, religion or belief, sex, gender, gender identity, sexual orientation and other personal characteristics or status'.* This definition is additionally enhanced by provisions of ECRI General Policy Recommendation N°7 (revised) on national legislation to combat racism and racial discrimination and ECRI General Policy Recommendation N°6 on Combating the dissemination of racist, xenophobic and antisemitic materiel via the internet.

Furthermore, the newest definition is offered by Recommendation CM/Rec(2022)16 of the Committee of Ministers to member States on combating hate speech where: *"For the purposes of this recommendation, hate speech is understood as all types of expression that incite, promote, spread or justify violence, hatred or discrimination against a person or group of persons, or that denigrates them, by reason of their real or attributed personal characteristics or status such as "race", colour, language, religion, nationality, national or ethnic origin, age, disability, sex, gender identity and sexual orientation."*

The term is frequently used by European Court of Human Right in its decisions, but Court has never offered its definition. In some of its judgments the Court states *that "all forms of expression which spread, incites, promote or justify hatred based on intolerance (including religious intolerance) are hate speech."* (Gündüz v. Turkey).

This shortage of definition at international level mirrors in all national legislations. Consequentially, there are too narrow or unreasonably broad definitions, definitions that are not distinguished from provisions for hate crime etc.[2]

The similar situation on international and all national levels is present regarding the definition of hate crime. Its legal definition varies around the world (Lučić-Ćatić *et al,* 2013). Basically, hate crime is a criminal offence where the perpetrator targets the victim in whole or in part out of a bias motive (Responding to Hate Speech against LGBT people,2013).

2 This situation is present in B&H legal system as will be discussed later.

Useful working definition of hate crime, in line with OSCE Ministerial Council Decision No. 9/09, is offered by Office for Democratic Institutions and Human Rights of the Organization for Security and Cooperation in Europe (hereinafter: ODIHR) which states that *"hate crimes are criminal acts committed with a bias motive"* and that they always comprise two elements The first element is the criminal offence[3], and the second element is the motivation[4] (OSCE/ODIHR,2022: 15.). Furthermore, the most common legal approach of criminalising hate crimes is penalty enhancements, which are sometimes referred to as "aggravating sentencing clauses" or "aggravating circumstances clauses". In essence, the penalty is increased for a base offence when it is committed with a bias motive. In most laws it is done by adding the element of hate in the definition of particular crime(s) and/or by prescribing hate a as compulsory aggravating circumstance/reason for higher penalties (Kolaković-Bojović, Đukanović, 2023).

Bearing in mind those definitions it is important to stress out that hate crime does not always involve hate speech and hate speech in and of itself is not always a hate crime (Lučić-Ćatić *et al,* 2016).

LEGAL PROVISIONS ON "HATE SPEECH" AND "HATE CRIME" IN B&H LEGISLATION

The prohibition of hate speech in B&H is not fully regulated or aligned with international standards. The criminal legislation criminalizes public incitement to hatred, discord and hostility regarding different groups of protected characteristics in different criminal codes (hereinafter: CCs) which is aggravated form of a hate speech.

CCs of B&H and Federation of B&H (hereinafter: FB&H) criminalizes public incitement to national, racial and religious hatred, discord and hostility. According to these laws, whoever publicly incites or inflames national, racial or religious hatred, discord or hostility among the constituent peoples and others who live in the respected area, shall be punished by imprisonment (CC of B&H - Article 145a; CC of FB&H - Article 163).

Those two CCs are limited to the prohibition of inciting and inflaming hatred on national, racial and religious grounds, but not on the grounds of skin color, gender, sexual orientation, disability and other grounds (Blažević 2019).

Furthermore, by the Decision Enacting the Law on Amendments to the CC of B&H, the High Representative in B&H amended Article 145a of the CC of B&H with new provisions. These provisions prohibit public condoning, denial, gross diminution or attempts to justify the crimes of genocide, crimes against humanity and war crimes established by final judgments,[5] directed against a group of persons or a member of a group determined by race, color, religion, background or national or ethnic origin, in a manner that could incite violence or hatred directed against such a group of persons or a member of such a group (Article 145a, 3).[6] Also, these amendments criminalized public incitement

3 The act must be an offence recognized by ordinary criminal law. Since there are small variations in legal provisions from country to country, there are some divergences in the kind of conduct that amounts to a crime (OSCE/ODIHR,2022: 15.).

4 The criminal act must be committed with a bias motive. Therefore, to qualify as hate crime, the committed crime needs to target one or more members of, or the property associated with, a group that shares a common characteristic. These characteristics are referred to as protected characteristics (OSCE/ODIHR,2022: 15.).

5 By a final judgment in accordance with the Charter of the International Military Tribunal annexed to the London Agreement of 8 August 1945 or the International Criminal Tribunal for the Former Yugoslavia or the International Criminal Tribunal or the Court of Bosnia and Herzegovina (CC of B&H - Article 145a, 3).

6 Until this amendment only the CC of FB&H criminalized inciting and inflaming national, racial and religious hatred, discord or intolerance by publicly denying or justifying genocide, crimes against humanity or war crimes established by a final decision of the International Court of Justice. International Criminal Tribunal for the former Yugoslavia or a

to violence or hatred directed against a group of persons or a member of a group determined by race, color, religion, origin, or national or ethnic origin (Article 145a, 2). Higher sentencing is proscribed if those acts are committed in a manner that makes leaflets, pictures or other materials available to the public or distributed to them (Article 145a, 4), if the offence is carried out in a manner likely to disturb public peace and order or which is threatening, abusive or insulting (Article 145a, 5), or if the perpetrator is an official or responsible person or employed in an institution of authority or any body financed through public budget. Besides that, giving a recognition, award, memorial, any kind of memento, or any privilege or similar to a person sentenced by a final judgement for genocide, crimes against humanity or a war crime, or naming a public object such as a street, square, park, bridge, an institution, building, municipality or a city or similar, or registering a brand, after or under a name of a person sentenced by a final judgement for genocide, crimes against humanity or a war crime is criminalized (Article 145a, 6).

Regarding those amendments it is important to stress out that those changes do not prohibit all condoning, denial, gross trivialization or attempts to justify crimes of genocide, crimes against humanity or war crimes, but only in the situations when it is directed against a group of persons or a member of a group defined by reference to race, color, religion, descent or national or ethnic origin, when the conduct is carried out in a manner likely to incite to violence or hatred against such a group or a member of such a group (Gačanica 2021).

Unlike those provisions the CCs of Republika Srpska (hereinafter: RS) and Brčko District of B&H (hereinafter: BDB&H) prescribes a punishment of imprisonment for whoever, by using the press, radio, television, a computer system or a social network, at a public gathering or at a public area or otherwise publicly calls for, incites or inflames or makes available to the public leaflets, images or any other materials that call for violence or hatred against a certain person or groups on account of their national, racial or religious or ethnic affiliation, skin color, sex, sexual orientation, disability, gender identity, origin or other properties (CC of RS, Article 359, 1; CC of BDB&H, Article 355a, 1).

Furthermore, all those provisions prescribed qualified form of incitement when it is committed by employing duress and abuse, jeopardizing safety, exposing national, ethnic or religious symbols to derision, damaging other people's belongings, or desecrating monuments or graves that can overlap with the construct of hate crime.

Beside those provisions there are other provisions in CCs that can be used to sanction hate speech [7] as well as the other laws such as the Law on Prohibition of Discrimination of B&H,[8] the Law on Gender Equality in B&H,[9] the Law on Freedom of Religion and the Legal Status of Churches and Religious

domestic court (CC of FB&H - Articles 163, 5).

7 The CC of FB&H (Article 363.) and CC of DB of B&H (Article 357.) criminalize usage of inciting or animosity language that obviously calls for or incites to violence or national or ethnical conflicts, and thereby brings public peace and order into danger. The CC of RS (Article 363.), criminalize behaviour such as shouting of slogans or carrying placards at a sporting event or public gathering aiming to provoke national, racial, religious or some other kind of hatred or intolerance based on some discriminatory grounds, which resulted in violence or a physical altercation with participants.

8 Law on Prohibition of Discrimination of B&H in Article 2 defines discrimination and its grounds from race and colour to sexual orientation.

9 Law on Gender Equality in B&H in Article 3 defines discrimination on the basis of gender.

Communities in B&H,[10] Election Law of B&H,[11] Code of the Communications Regulatory Agency,[12] laws on the protection of public order and peace, cantonal laws on information,[13] cantonal laws on public assembly etc.

At the end we can conclude that, as visible from presented laws and codes, the regulation of hate speech is not uniform within B&H's legal system and that those regulation are not in line with international standards.

Regarding the hate crime CCs of Entities and BDB&H proscribe hatred as aggravating factors for a wide range of qualified criminal offences.[14] Offences of this type differ from one jurisdiction to another mainly by different legislative techniques and possible sanctions.

Namely, "hatred" as an aggravating circumstance is clearly defined in CC BDB&H in sentencing all crimes, while CC of RS (Article 52, 3) and CC of FB&H (Article 2,11) defines "committing acts of hatred" as an aggravating factor. The CC BDB&H (Article 2, 37) in basic terms defines the meaning of „hatred" as a motive for committing a crime, while the CC of RS (Article, 123,21) and CC of FB&H (Article 2,11) defines the meaning of "hate crime." These legal solutions imperatively require that courts consider hatred as an aggravating circumstance in all criminal cases.

Finally, it is important to stress out that existing provisions in CCs in B&H enable possibility that same act (criminal offence) can be prosecuted as hate crime as well as hate speech (incitement to hatred) that can lead to inadequate judicial responses to both phenomena.

10 Law on Freedom of Religion and the Legal Status of Churches and Religious Communities in Bosnia and Herzegovina in Article 5 prohibits discrimination on the basis of religion or belief, as well as activities or acts aimed at inciting religious hatred against any church or religious community and its members (c), and inciting, condoning or calling for religious intolerance and hatred (g), but without prescribing any sanctions. Therefore, the protection must be achieved through channels of criminal law.

11 The Election Law of BiH in the Article 19.9, paragraph j prescribes a fine for political subjects who use language which could provoke or incite someone to violence or spreading of hatred, or publish or use pictures, symbols, audio and video recordings, SMS text messages, internet messages or other materials that can have such an effect. In the Article 16.14, paragraph 3 this law also prohibits the conduct of an election campaign by way of electronic and printed media where the contents are stereotypical and offensive against men and/or women or which encourages any stereotype and offensive behaviour on the grounds of gender or any humiliating attitude against the members of different genders.

12 Code in the Article 4, paragraph 1states that it is prohibited to humiliate, intimidate or incite hatred, violence or discrimination against a person or group on the grounds of sex, race, ethnicity, nationality, religion or belief, disability, special needs, age, sexual orientation, social origin or on the basis of any other circumstance which has the purpose or consequence of preventing or endangering any person's recognition, enjoyment or exercise on an equal basis of their rights and freedoms. In the same article, paragraph 2 is stated that radio and television broadcasters shall not create a clear and immediate risk of inciting hatred, violence or discrimination against a person or group on these grounds, or which may be interpreted by the public as incitement to hatred, violence, disorder and unrest, or which could provoke or incite crimes.

13 Some of those laws state that public information shall not directly or indirectly encourage racial, national or religious hatred and intolerance, but they do not prescribe penalties.

14 Due to the jurisdiction of the Court of B&H (it has no jurisdiction over murder, grievous bodily harm, rape, serious theft, robbery, aggravated robbery, and causing general danger) it is logical that this provision as well as the absence of a definition of "hatred" are not included in CCB&H. See more in: Lučić-Ćatić, M., Bajrić, A. (2013). Procesuiranje kaznenih djela počinjenih iz mržnje u Bosni I Hercegovini: Perspektiva tužitelja. Sarajevo: Analitika

PROSECUTION OF "HATE SPEECH" AND "HATE CRIME" IN JUDICIAL PRACTICE IN B&H

Methodology

Given the fact that existing legal provisions in B&H can lead to inadequate responses on the occurrences of hate speech and hate crime we conducted research of approaches of B&H's judiciary in solving those crimes through critical analyzes of existing case law in all four jurisdictions in B&H between 2012 and 2022 with absolute sample of hate crime and hate speech court cases. [15]

Analysis was conducted by using the six elements test - the Rabat Plan of Action and Article 19[16] aiming to establish threshold of criminal liability on a case-by-case basis. Finally, the authors tried to determine the extent of inadequate application of the existing legal framework by prosecutors and judges.

The questioned sample was consisted of 47 cases in total. Eight were cases of hate crime and 39 cases of a hate speech.[17]

Rabat Plan of Action and Article 19

Bearing in mind problems in interpreting and implementing international obligations regarding prohibition all advocacy that constitutes incitement to discrimination, hostility or violence ("incitement to hatred"), as mandated by Article 20(2) of the International Covenant on Civil and Political Rights (hereinafter: ICCPR), the Office of the United Nations High Commissioner for Human Rights (hereinafter: OHCHR) adopted a document "Rabat Plan of Action on the prohibition of advocacy of national, racial or religious hatred that constitutes incitement to discrimination, hostility or violence".

Namely, article 20, paragraph 2 of the ICCPR states that any advocacy of national, racial or religious hatred that constitutes incitement to discrimination, hostility or violence shall be prohibited by law. Therefore, article 20 requires a high threshold because limitation of freedom of expression must remain an exception. The Rabat Plan of Action suggests that each of the six parts of the following threshold test needs to be fulfilled for a statement to amount to a criminal offence:

These elements (and sub-elements) are:[18]

- Context of the expression;

15 The sample is created according to evidence of the OSCE Mission in B&H presented on Hate monitors and in accordance with their records absolute sample is achieved. Based on the records from Hate monitors we sent a request to the respective prosecutor's offices and courts for access to cases.

16 Recommendation CM/Rec(2022)16 of the Committee of Ministers to member States on combating hate speech also offers guidelines for assessment of the severity of hate speech and tools for determining type of liability in each case but since they are similar to those offered in Rabat Plan of Action and Article 19 the authors used only tools offered in Rabat Plan of Action and Article 19.

17 2012: 2 cases (1 hate crime and 1 incitement to hatred); 2013: 7 cases (3 hate crime and 4 incitements to hatred); 2014: 8 cases (all 8 incitements to hatred); 2015: 3 cases (1 hate crime and 2 incitements to hatred); 2016: 1 case (incitements to hatred); 2017: 3 cases (all 3 incitements to hatred); 2018: 4 cases (1 hate crime and 3 incitements to hatred); 2019: 3 cases (1 hate crime and 2 incitements to hatred); 2020: 4 cases (1 hate crime and 3 incitements to hatred); 2021: 11 cases (all 11 incitements to hatred); 2022: 1 case (incitements to hatred);

18 All elements and sub-elements are retrieved from the analysis of Rabat Plan of Action on the prohibition of advocacy of national, racial or religious hatred that constitutes incitement to discrimination, hostility or violence and Prohibiting incitement to discrimination, hostility or violence – Policy brief (2012) Article 19 and United Nations, Human Rights Office of the High Commissioner: One-pager on "incitement to hatred". Web site: https://www.ohchr.org/sites/default/files/Rabat_threshold_test.pdf

  - Existence of conflicts within society;
  - Existence and history of institutionalized discrimination;
  - History of clashes and conflicts;
- Speaker/proponent of the expression;
  - The official position of the speaker;
  - The level of the speaker's authority or influence over the audience;
  - Politicians/prominent members of political parties;
  - Public officials or persons of similar status;
- Intent of the speaker/proponent of the expression to incite to discrimination, hostility or violence;[19]
  - Language used by the speaker;
  - Objectives pursued by the speaker;
  - The scale and repetition of the communication;
- Content of the expression;
  - What was said;
  - Who was targeted (the audience);
  - Who was targeted (the potential victims of discrimination, violence or hostility);
  - How it was said (tone);
  - What form the expression took;
- Extent and magnitude of the expression;
  - The public nature of the expression;
  - The means of dissemination of the expression;
  - The magnitude of the expression.
- Likelihood of the advocated action occurring, including its imminence;
  - Was the speech understood by its audience to be a call to acts of discrimination, violence or hostility?
  - Was the speaker able to influence the audience?
  - Did the audience have the means to resort to the advocated action, and commit acts of discrimination, violence or hostility?
  - Had the targeted victim group suffered or recently been the target of discrimination, violence or hostility?

EXAMPLE OF ANALYSIS

Case 1[20]

Description of a case: After the news that Zoran Milanović, President of Republic of Croatia, left the annually celebration "Bljesak" in Okučani, was published on the Internet portal JABUKA.TV the ac-

19 Article 19 strongly suggests that incitement under Article 20(2) of the ICCPR or Article 4(a) of the ICERD requires intention on the part of the speaker, as opposed to recklessness or negligence (Policy brief (2012) Article 19).

20 T08 0 KT 0007635 21 (08.07.2021.) i 64 O K 061774 21 Kps (30.08.2021.)

cused, using username "Shadow", posted following comment: "Who … (swearword) your mother you traitor, you should be dead you communist … (swearword)." The comment was public and accessible to the wider social community.

Indictment: Article 163 - Inciting National, Racial or Religious Hatred, Discord or Hostility of a CC of FB&H

Six-part test:

- *Context of the expression;*
- B&H has well known history of conflicts between people of different nationalities and the municipality where this case happened presumable victims are *de facto* minority.[21]
- *Speaker/proponent of the expression;*

  Speaker did not have an official position or audience that he could influence. He was not a prominent member of political parties or public official. He did not have prior convictions in general and especially prior convictions for hate crime or hate speech. Furthermore, criminal investigation did not show prior actions related to hate crime or hate speech.

- Intent of the speaker/proponent of the expression to incite to discrimination, hostility or violence;

  The speaker used threatening language and slur without further repetition of the communication.

- Content of the expression;

  The expression in a written form and it was threatening and insulting but not directly based on the nationality, race or religion of the presumed victims.

- Extent and magnitude of the expression;

  This expression happened in online sphere so there will be further dissemination.

- Likelihood of the advocated action occurring, including its imminence;

  From the written expression it is unclear what accused was advocating for.

After a thorough analysis of elements and sub-elements of the incident it is evident that acts (expression) of the accused (speaker) does not reach a threshold that needs to be fulfilled for a statement to constitute a criminal offence of "Inciting National, Racial or Religious Hatred, Discord or Hostility".

Case 2[22]

Description of a case: The accused (Muslim) was in his car, passing a house in front of which people of Serbian nationality were sitting. He stopped in front of a house and used a slur toward the victims who were sitting in front of a house and then he drove away. In a few minutes he came back on foot carrying a plastic gun that resembled a lot to a real one, pointed it toward the victims and told them that he will kill them using more slur toward their nationality.

Indictment: Article 163 - Inciting National, Racial or Religious Hatred, Discord or Hostility of a CC of FB&H

21 Even though different ethnic, national, and religious groups in the B&H are not recognised as minority groups by law, in reality they often are, such for example persons returning to some part of the B&H who had left during or due to the war.

22 T04 0 KT 0031630 17 (10.10.2017.) i 43 0 K 151843 17 K (10.01.2018.)

Six-part test:

- Context of the expression;

  B&H has well known history of conflicts between people of different nationalities and the municipality where this case happened presumable victims are *de facto* minority.

- *Speaker/proponent of the expression;*

  Speaker did not have an official position or audience that he could influence. He was not a prominent member of political parties or public official. He had two prior convictions for a criminal offences of theft (CC of FB&H - Article 286). He did not have prior convictions for hate crime or hate speech and criminal investigation did not show prior actions related to hate crime or hate speech.

- Intent of the speaker/proponent of the expression to incite to discrimination, hostility or violence;

  The speaker used threatening language and slur without further repetition of the communication. He spoke directly to the victims.

- Content of the expression;

  The expression was oral form, and it was threatening and insulting based on the nationality of the victims. Only targeted audience was those who were in front of a house.

- Extent and magnitude of the expression;

  This expression happened in a public place, but it was a one-time incident without further dissemination.

- Likelihood of the advocated action occurring, including its imminence;

  Given the identified extent and magnitude of the expression likelihood of the advocated action occurring was non-existing one.

After a thorough analysis of elements and sub-elements of the incident it is evident that act (expressions) of the accused (speakers) was not "incitement to hatred" but that it was typical acts of hate crime (Endangering Security - CC of FB&H - Article 183. with bias motive).

DISCUSSION AND CONCLUSIONS

Using he six elements test on a case-by-case basis (as presented in the previous analyses of Case 1 and Case 2) we questioned does those cases reach a threshold that needs to be fulfilled for a statement to amount to a criminal offence and in cases where not, does those cases represent cases of a hate crime rather than a cases of incitement to hatred.

After an in-depth analysis of 47 court case in a ten-year period (where 8 were classified as hate crime and 39 as incitements to hatred) we came to the conclusion that approximately 77% of all cases indicted for incitement to hatred do not reach a necessary threshold. Out of those 39 indictments, according to the results of six elements test, 9 are incitements to hatred while the rest of them - 30 are note. Nine of those 30 cases are in fact a different forms of hate crime (criminal act + bias motive) rather than hate speech while the rest of them could represent a violation of some other provisions such as Laws on Public Order and Peace.

Regarding the verdicts of the cases that we found inadequately qualified as incitement to hatred out of the 27 verdict (3 cases are still in process) 20 resulted in conviction and only 7 in acquittal. Out of those 7 that resulted in acquittal one could be trial as a hate crime and the rest of them represent violation of some of previously mentioned regulation of hate speech.

This very high percent of incorrectly qualified cases leads us to the conclusion that most of the practitioners (prosecutors, lawyers, and judges) do not understand the very concept of hate crime and hate speech. Explicitly, existing legal framework offer possibilities for prosecution of the hate crime cases as well as the cases of the incitement to hatred (aggravated forms of hate speech) in different ways and with different legal consequences while the other laws can be used for a hate speech form that do not reach threshold necessary for incitement to hatred. Therefore, limitations and deficiencies in the CCs regarding those issues (previously discussed overlapping) cannot be used as the excuse for those misconceptions that has enormous consequences in B&H's society.

Namely, as previously pointed out B&H is ethnically and religiously heterogeneous, divided, and post-war society where hate speech creates new antagonisms and can lead to another conflict, radicalization, and violent extremism. The role that hate speech played in the dissolution of former Yugoslavia, the magnitude of ethnocentric rhetoric and aggressive nationalism should not be overlooked and therefore inadequate prosecution of incitement to hatred should not be taken lightly. Misapplication of the provision of incitement to hatred for prosecuting cases of a hate speech that does not represent incitement to hared or that are a hate crime cases, raise the question of legal security and ability of professional to recognize, identify and react on a true case of the incitement to hatred. Adequate legal and social response to hate speech and hate crime has wide repercussions on the entire B&H's society and therefore state must respond on those harmful behaviours in legally correct manner.

Recommendations

Extremely important step in advancing the fight against hate crime and hate speech is sensitization of holders of judicial functions regarding specific nature and numerous influences of those criminal offences. Namely, it is very important that the holders of judicial functions become aware of the importance and negative consequences of hate speech and hate crimes for the individual, the group to which they belong, and for society as a whole. It is necessary to raise awareness of the importance of an adequate response of the judicial system which, just like the committing of the crime itself, have far-reaching consequences.

Furthermore, it is vital to familiarise prosecutors and judges with the Rabat Plan of Action and Article 19 as a threshold test that needs to be fulfilled for a statement to amount to a criminal offence (incitement to hatred) in order to improve current judicial practice.

And finally, since continuous training[23] is the best way to improve the judicial response to hate speech and hate crimes, it is necessary to implement obligatory continuous educational processes for holders of judicial functions and other subjects involved in criminal proceedings on the legal nature of incitement to hatred and hate crimes.

23 During the last decade a lot of trainings (supported by Organization for security and co-operation in Europe, Council of Europe, non-governmental organizations, faculties etc.) for holders of judicial functions and other subjects involved in criminal proceedings on the legal nature of incitement to hatred and hate crimes were available but they were not obligatory and therefore dissemination of needed knowledge stayed limited. Therefore, the authors' recommendation goes in the direction of mandatory trainings.

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CRIMINAL OFFENCES AGAINST THE ECONOMY IN THE REPUBLIC OF SERBIA 2018-2023

Radmila Trklja, PhD[1]
Boban Dašić, PhD
Kosovo and Metohija Academy of Applied Studies, Leposavić, Serbia

PURPOSE

Economic crime is a negative phenomenon in all countries, both in developed and developing ones. As such, it is a serious obstacle to economic security and economic development, and a serious obstacle to the accession of the Republic of Serbia to the European integration process. Economic security is considered "a part of national and an element of individual security" (Radović-Stojanović, Tomić & Ljubojević, 2024, 324). Ensuring economic security, economic development and European integration of Serbia is up to the state. It is the state that holds the position at the very top of the economic pyramid (Dašić, Dašić & Trklja, 2021, 439). The state achieves its goals by applying various measures including monetary and fiscal policy measures, "as well as by the criminal activity of its security services in the field of preventing and suppressing organized economic crime" (Nicević & Ivanović, 2012, 88). Considering the topic of our paper, we will perform an analysis of criminal offenses against the economy in the Republic of Serbia in the period from 2018 to 2023. Economic crime is a socially negative phenomenon. The economic system and economic relations, i.e. the economic security of the country, are protected by fighting against all types of economic crime. There is no single definition of economic crime. There are several reasons for that. One of the reasons is the different manifestations of economic crime in different social communities (due to different socio-economic and political relations). Even within the same social community in different periods of time, economic crime manifests itself differently (due to changes in the form of property). In any case, the consequences of economic crime are numerous: "The consequences of criminal offenses in this area are the creation of unfair competition on the market, the reduction of jobs, the reduction of the quality of public services due to the reduction of budget revenues, the emergence of the gray economy, illegal markets and more" (Cvetković & Kešetović, 2018, 43).

In Serbia, as well as in the rest of the world, there are currently no more precise data on how much damage economic crime has caused to the economy and the population. There are many reasons why it is impossible to estimate the total cost of economic crime (Grabosky, 2001). The prevalence, frequency and techniques of certain forms of economic crime evolve over time, constantly adapting in terms of their organisation, depending on the skills, networks and locations of those involved (Lord & Levi, 2023). Regardless, the overall impact of economic crime on the economy of a country is huge, causing damage first of all to the state, then to various economic entities, as well as to individuals.

1 radatrklja@gmail.com

DESIGN/METHODS/APPROACH

The goal of the paper is to analyse criminal offenses against the economy in the Republic of Serbia in the period from 2018 to 2023 and to indicate new measures and methods of combating it. In accordance with the topic of our paper, the level and movement of criminal offenses against the economy in the Republic of Serbia in the period from 2018 to 2023 were analysed. An insight into the data, scope and scale of economic crime can be found in the publications of the Statistical Office of the Republic of Serbia, such as Judiciary Statistics - Adult Offenders.

The analysis of data published by the Statistical Office of the Republic of Serbia refers to the period from 2018-2023, for the purpose of a more complete overview of the development of this phenomenon. Special attention was paid to the analysis of basic data on the adult perpetrators of criminal offenses against the economy, namely: reported perpetrators (number and %), accused (number and %), convicted perpetrators (number and %), reported perpetrators by region of Serbia (number), convicted perpetrators according to imposed criminal sanctions (number).

The approach to this research includes various techniques, starting with literature review, analysis of official publications of the Statistical Office of the Republic of Serbia, and statistical data processing including calculation of percentages. During the research, the following methods were used: the method of analysis and synthesis, the method of induction and deduction, the method of generalisation, the method of concretisation and statistical method.

The aim of this analysis is to compare the level of criminal offenses against the economy in the Republic of Serbia, as well as by region. The data source are statistical publications of the Statistical Office of the Republic of Serbia, namely, Statistical Releases in the field of Judiciary.

FINDINGS

In order to get a more complete picture of the situation regarding the level of criminal offenses against the economy in the Republic of Serbia, in this paper we will use the statistical data of the Statistical Office of the Republic of Serbia.

“Criminal offenses against the economy in the Republic of Serbia from 2001 until the transfer of the effects of the global financial and economic crisis to Serbia in 2009 decreased by 48.3% for reports, 60.1% for accusations and 62.2% for convictions.” Since 2010, their number had been increasing again until 2015. Since 2015, economic crime in the Republic of Serbia has been declining as a result of intensified efforts in the fight against economic crime undertaken by state authorities during this period” (Radović-Stojanović, 2021, 104, 105).

In the continuation of the paper, we will survey the analysis of criminal offenses against the economy in the period from 2018-2023.

Table 1. *Reported Adult Perpetrators of Criminal Offences, Total and Against the Economy, Number and %, 2018–2023*

Year	Total		Against the Economy	
	Number	%	Number	%
2018	92874	100	2767	3
2019	92797	100	2461	2.7
2020	74394	100	1814	2.4
2021	80632	100	1946	2.4
2022	82958	100	1921	2.3
2023	74504	100	2172	2.9

Source: Statistical Office of the Republic of Serbia, 2023, 1. (for the period from 2018 to 2022, Statistical Release no 184); Statistical Office of the Republic of Serbia, 2024, 1. (for 2023, Statistical Releases no 186)

From table 1, looking at the period from 2018 to 2023, one can notice the change of periods of decline (2018-2020 and 2023) with periods of growth (2021-2022) in the total number of reported adult perpetrators. In 2018, which we will take as a base, we have the largest number of adult perpetrators (92,874). In 2019 we have a decrease of less than 0.1%, in 2020, the decrease of 20%, in 2021, the decrease of 13%, in 2022, the decrease of 11%, and in 2023 the decrease of 20%. In the observed period, 2020 was the year with the lowest number of adult perpetrators. As for the number of adult perpetrators of criminal offenses against the economy in relation to the total number of adults against whom criminal charges were filed, the percentage expressed in 2018 was 3%, in 2019 2.7%, in 2020 2.4%, in 2021 2.4%, in 2022, 2.3%, and in 2023 2.9%. The period from 2018 to 2022 shows us a trend of decreasing the number of reported perpetrators of criminal offenses against the economy, while 2023 is characterised by a slight increase in their number.

Table 2. *Accused Adult Perpetrators, Total and Against the Economy, Number and %, 2018–2023*

Year	Total		Against the Economy	
	Number	%	Number	%
2018	35146	100	1683	4.8
2019	32360	100	1345	4.2
2020	29389	100	1166	4.0
2021	31870	100	1207	3.8
2022	30406	100	1070	3.5
2023	31101	100	1087	3.5

Source: Statistical Office of the Republic of Serbia, 2023, 2. (for the period from 2018 to 2022, Statistical Release no. 184); Statistical Office of the Republic of Serbia, 2024, 1. (for 2023, Statistical Release no. 186)

The total number of accused perpetrators in the period from 2018-2023 show the alternating periods of decline and growth. Annually, that number is around 30,000 accused adults. The situation regarding the number of accused perpetrators for criminal offenses against the economy in relation to the total

number of accused adults, expressed as in terms of percentage in 2018, is 4.8%, in 2019 4.2%, in 2020 4.0%, in 2021 3.8%, in 2022 3.5%, and in 2023 3,5%. These data also tell us that the number of accused adult perpetrators for criminal offenses against economy has been decreasing in percentage.

Table 3. *Convicted Adult Perpetrators, Total and Against the Economy, Number and %, 2018–2023*

Year	Total		Against the Economy	
	Number	%	Number	%
2018	29750	100	1144	3.8
2019	28112	100	1008	3.6
2020	25487	100	842	3.3
2021	27508	100	885	3.2
2022	26200	100	762	2.9
2023	26919	100	859	3.2

Source: Statistical Office of the Republic of Serbia, 2023, 2. (for the period from 2018 to 2022, Statistical Release no. 184); Statistical Office of the Republic of Serbia, 2024, 2. (for 2023, Statistical Release no. 186)

The total number of convicted adult perpetrators in the period from 2018 to 2020 recorded a slight decrease, after which the year 2021 was characterised by an increase in the number of convicted adult perpetrators. In 2022 there was a decrease again, and in 2023 a slight growth. The percentage data regarding the number of adult perpetrators convicted for criminal offenses against the economy in relation to the total number of adult perpetrators convicted are as follows: in 2018 3.8%, in 2019 3.6%, in 2020 3.3%, in 2021 3.2%, in 2022 2.9%, and in 2023 3.2%. So, from 2018 to 2022, there was a decline in the number of adults convicted of crimes against the economy. In 2023, there was a visible increase in the number of adults convicted of crimes against the economy (13% more than in 2022).

In the continuation of our paper, we will perform an analysis of reported adult perpetrators according to the criminal offenses against the economy in 2023 in total for the Republic of Serbia and by regions, namely: Region - North, which includes the Belgrade Region and the Vojvodina Region; and Region - South, which includes the Region of Šumadija and Western Serbia, the Region of Southern and Eastern Serbia and the Region of Kosovo and Metohija. Please note that since 1999 the Statistical Office of the Republic of Serbia has not had data for the Region of Kosovo and Metohija because it is under the jurisdiction of the United Nations and resolution 1244.

Table 4. *Reported Adult Perpetrators of Criminal Offenses Against the Economy by Regions of Serbia, 2023*

Criminal offenses against the economy	Total	Serbia - north		Serbia - south		
		BR	RV	RŠWS	RSES	RKM
	2172	639	661	559	313	-
Fraud in performing economic activity	62	17	20	24	1	-
Insurance fraud	12	9	1	2	-	-
Embezzlement in the performance of economic activity	114	25	34	39	16	-

Abuse of trust in performing economic activity	11	5	3	2	1	-
Tax evasion	416	113	121	106	86	-
Non-payment of withholding tax	3	-	1	1	1	-
Abuse of the position of responsible person	225	71	63	81	10	-
Abuse connected to public procurement	25	1	5	16	3	-
Abuse in the privatisation process	4	-	-	4	-	-
Conclusion of the restrictive agreement	7	1	6	-	-	-
Accepting bribes in performing economic activities	18	2	14	-	2	-
Giving bribes in the performance of economic activity	5	3	-	-	2	-
Causing bankruptcy	2	1	-	-	1	-
Damage to creditors	16	1	8	6	1	-
Illegal production	28	5	8	14	1	-
Illegal trade	177	34	59	46	38	-
Smuggling	8	1	4	1	2	-
Disabling control	7	4	1	2	-	-
Unauthorised use of someone else's business name and other special marks of goods or services	139	21	34	66	18	-
Damage to business reputation and creditworthiness	3	1	-	2	-	-
Disclosure of business secrets	11	1	3	1	6	-
Forgery of money	51	6	8	30	7	-
Falsification of securities	1	-	-	-	1	-
Falsification and abuse of payment cards	756	270	278	135	73	-
Forging characters for value	1	-	1	-	-	-
Money laundering	62	42	2	1	17	-
Abuse of authority in the economy	8	5	2	-	1	-

Abbreviations: BR – Belgrade region; RV – Region of Vojvodina; RŠWS – Region of Šumadija and Western Serbia; RSES – Region of Southern and Eastern Serbia; RKM - Region of Kosovo and Metohija. Source: Statistical Office of the Republic of Serbia, 2024, Statistical Release no 186, 5.

As indicated in Table 1, the total number of reported adult perpetrators of criminal offenses against the economy in Serbia in 2023 was 2,172. The listed criminal offenses against the economy in the Republic of Serbia reveal that the largest number of reported adult persons have committed the criminal offense of forgery and misuse of payment cards (756 or 35% of all listed criminal offenses against the economy). It is followed by the tax evasion (416 or 19%), abuse of the position of responsible person (225 or 10%), illegal trade (177 or 8%), unauthorised use of someone else's business name and other

special marks of goods or services (139 or 6%) and embezzlement in the performance of economic activity (114 or 5%). These 6 criminal offenses account for about 83% of the total number of registered adults for criminal offenses against the economy. The smallest number of reported adults is for the criminal offense of falsification of securities (1), forging characters for value (1) and causing bankruptcy (2). Taking into consideration the regions, it is noticeable that there is almost the same number of registered adults for criminal offenses against the economy with permanent residence in the Region of Vojvodina (661), the Belgrade Region (639) and the Region of Šumadija and Western Serbia (559), while the Region of Southern and Eastern Serbia has the lowest number of reported adult perpetrators of criminal offenses against the economy (313). Analysing the type of criminal offense against the economy by individual regions, the following situations are observed.

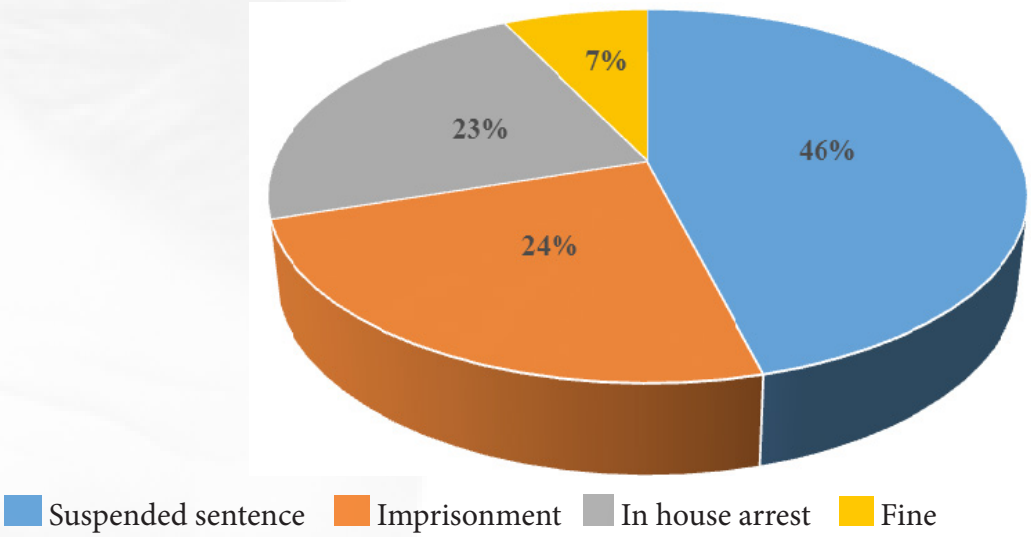
For the Belgrade region, these are the numbers: fraud and misuse of payment cards (270 or 42% of all reported adult perpetrators of criminal offences against the economy in that region), tax evasion (113 or 18%) and abuse of the position of responsible person (71 or 11%) are leading, while at the bottom of the table we found disclosure of business secrets (1), damage to business reputation and creditworthiness (1), smuggling (1), damage to creditors (1), causing bankruptcy (1), conclusion of the restrictive agreement (1) and abuse connected to public procurement (1). It is interesting that there were no perpetrators at all for the criminal offenses of forging characters for value, falsification of securities, abuse in the privatisation process, and non-payment of withholding tax.

In the Region of Vojvodina, forgery and abuse of payment cards consist of 278 or 42% of all reported adult perpetrators of criminal offences against the economy in that region, tax evasion 121 or 18%, abuse of the position of the responsible person 63 or 10% and illegal trade 59 or 9%, while at the bottom of the list there are forging characters for value (1), disabling control (1), non-payment of withholding tax (1) and insurance fraud (1). There are no adult perpetrators of falsification of securities, damage to business reputation and creditworthiness, causing bankruptcy, giving bribes in the performance of economic activity, and abuse in the privatisation process. The only adult perpetrator of the criminal offense of forging characters for value in the entire territory of the Republic of Serbia is from the region of Vojvodina.

The region of Šumadija and Western Serbia have the largest number of adult perpetrators for the criminal offenses of falsification and abuse of payment cards (135 each or 24% of all reported adult perpetrators of criminal offences against the economy in that region), tax evasion (106 or 19 %), abuse of the position of the responsible person (81 or 14%) and unauthorised use of someone else's business name and other special marks of goods or services (66 or 12%). There is one perpetrator per each of the following offenses - money laundering, disclosure of business secrets, smuggling, and non-payment of withholding tax. There are no registered adult offenders for the criminal offense of abuse of authority in the economy, forging characters for value, falsification of securities, causing bankruptcy, giving bribes in the performance of economic activity, accepting bribes in performing economic activities, and conclusion of the restrictive agreement. All 4 perpetrators of the criminal offense of misuse in the privatisation process in the Republic of Serbia come from the Šumadija Region and Western Serbia.

The Regions of South and East Serbia include the largest number of reported adult perpetrators of tax evasion (86 or 27% of all listed criminal offenses against the economy in that region), and falsification and abuse of payment cards (75 or 24%), while only one for abuse of authority in the economy, falsification of securities, illegal production, damage to creditors, causing bankruptcy, non-payment of withholding tax, abuse of trust in performing economic activity, and fraud in performing economic activity. The only perpetrator of the criminal offence falsification of securities in the Republic of Serbia comes from this region.

In the continuation of the paper, we will present a graphic representation of the imposed criminal sanctions for convicted adult perpetrators of criminal offences against the economy in % for the year 2023.



Source: Author's projection based on: Statistical Office of the Republic of Serbia, 2024, 9, 10.

Graph 1. *Imposed Criminal Sanctions for Convicted Adult Persons Against the Economy (%), 2023*

Out of a total of 859 adult persons sentenced for criminal offenses against the economy, the most imposed criminal sanctions refer to suspended sentences (393 or 46% of all types of criminal sanctions imposed for criminal offenses against the economy), imprisonment (207 or 24%), in house arrest (193 or 22%) and fine (63 or 7%). An insignificant share of 0.02% in the total number of adult persons convicted of the criminal offense of anti-violence, i.e. with one imposed criminal sanction pertains to : "community payback service and revocation of a driver's license" (for the criminal offense illegal trade), "corrective measures" (for the criminal offense of forgery and misuse of payment cards) and "declared guilty and acquitted (for the criminal offense of causing bankruptcy), while for the criminal sanction "court warning" there is not a single convicted person.

Table 5. *Convicted Adults by Criminal Offences and Imposed Criminal Sanctions, 2023*

Criminal offenses against the economy	**T**	**I**	**F**	**SS**	**IHA**
	859	**207**	**63**	**393**	**193**
Fraud in the performance of economic activity	26	11	-	8	7
Insurance fraud	1	-	-	1	-
Abuse of trust in performing economic activity	13	1	-	8	4
Embezzlement in the performance of economic activity	88	9	-	58	21
Tax evasion	199	48	13	97	41
Non-payment of withholding tax	7	1	2	3	1
Abuse of the position of responsible person	79	27	-	27	25
Abuse in connection with public procurement	20	5	-	14	1
Conclusion of the restrictive agreement	2	1	-	-	1

Accepting a bribe in the performance of economic activity	3	1	1	-	1
Giving bribes in the performance of economic activity	24	1	1	22	-
Causing bankruptcy	1	-	-	-	-
Damage to creditors	4	1	-	2	1
Illegal production	28	8	3	13	4
Illegal trade	88	5	23	54	5
Smuggling	21	6	2	10	3
Disable control	10	3	1	5	1
Unauthorised use of someone elsess business name and other special marks of goods or services	48	10	7	24	7
Damage to business reputation and creditworthiness	-	-	-	-	-
Disclosure of business secrets	-	-	-	-	-
Forgery of money	18	12	1	2	3
Falsification of securities	3	1	-	2	-
Falsification and abuse of payment cards	123	47	6	7	62
Forging characters for value	2	1	-	-	1
Abuse of authority in the economy	1	-	-	1	-
Misleading customers	3	1	1	1	-
Money laundering	47	7	2	34	4

Abbreviations: T - Total, I - Imprisonment, F - Fine, SS - Suspended sentences, IHA - In house arrest Source: Statistical Office of the Republic of Serbia, 2023, 9, 10.

Looking at the table 5, we notice that the most convicted adults are for the following criminal offenses against the economy, namely: tax evasion (199 or 23% of all convicted adults for the criminal offenses against the economy and imposed criminal sanctions), falsification and abuse of payment cards (123 or 14%), illegal trade (88 or 10%), embezzlement in the performance of economic activity (88 or 10%). On the other hand, the least convicted, 1 per each offense, is for the criminal offenses insurance fraud, causing bankruptcy, and abuse of authority in the economy.

Of the 207 adults sentenced to imprisonment, the majority were convicted for the criminal offenses of tax evasion (48 or 23%), falsification and abuse of payment cards (47 or 23%), abuse of the position of a responsible person (27 or 13%), and the least (1 each) for criminal offenses abuse of trust in performing economic activity, non-payment of withholding tax, conclusion of the restrictive agreement, accepting a bribe in the performance of economic activity, giving a bribe in the performance of economic activity, damage to creditors, falsification of securities, forging characters for value, and misleading customers. There were no persons sentenced to imprisonment for the criminal offenses of insurance fraud, causing bankruptcy, damage to business reputation and creditworthiness, and disclosure of business secrets.

Thus, 63 persons were sentenced to fines. Most of those convicted were for the offences of illegal trade (23 or 37%) and tax evasion (13 or 21%) and the least (1 each) for accepting a bribe in the performance of economic activity, giving a bribe in the performance of economic activity, disable control, forgery

of money, and deceiving customers. There were no persons convicted to pay a fine for criminal offenses fraud in the performance of economic activity and insurance fraud, abuse of trust in performing economic activity, embezzlement in the performance of economic activity, abuse of the position of the responsible person, abuse in connection with public procurement, conclusion of the restrictive agreement, causing bankruptcy, damage to creditors, damage to business reputation and creditworthiness, disclosure of business secrets, falsification of securities, forging characters for value, and abuse of authority in the economy.

As stated above, the largest number of adults were given suspended sentences for criminal offenses against the economy (393). The following criminal offenses are the most common: tax evasion (97 or 25%), embezzlement in the performance of economic activity (58 or 15%), and illegal trade (54 or 14%).

The least suspended sentences (1 each) refer to the criminal offenses of insurance fraud, abuse of authority in the economy, and deceiving customers. There were no suspended sentences for the following crimes: conclusion of the restrictive agreement, accepting a bribe in the performance of economic activity, causing bankruptcy, damage to business reputation and creditworthiness, disclosure of business secrets, and forging characters for value.

The most common criminal offenses committed by the convicted adults (193) with the criminal sanction "in house arrest" are falsification and abuse of payment cards (62 or 32%), tax evasion (41 or 21%), abuse of the position of the responsible person (25 or 13%), and embezzlement in the performance of economic activity (21 or 11%), and the fewest convicted (one per each offense) were for the criminal offences of non-payment of withholding tax, abuse in connection with public procurement, conclusion of the restrictive agreement, accepting a bribe in the performance of economic activity, damage to creditors, disable control, and forging characters for value. With the criminal sanction of "house arrest", there were no persons convicted of criminal offences: insurance fraud, bribery in the performance of economic activity, causing bankruptcy, damage to business reputation and creditworthiness, disclosure of business secrets, falsification of securities, abuse of authority in the economy, and misleading customers.

ORIGINALITY/VALUE

The consequences of criminal offenses against economy are negative for enterprises, the entire economy and the country, and it is necessary to permanently monitor this type of crime and proactively and continuously implement effective measures to prevent and suppress it. It must be a priority item for creators of economic policy because this negative phenomenon affects the country's economic stability, national security, democracy and the rule of law.

Since economic crime today is characterised by an increase in sophistication and complexity, the methods and fight against it should also be improved and modernised. As the support for the fight against the economic crime, we propose the following measures:

- Tightening of the penal policy for violators of the law in the field of economy. Please note that the penal policy must be harmonised with the regulations of the European Union. Undeniably, Serbia must "find its own solutions in accordance with its own traditions and institutions" (Dašić & Trklja, 2023, 372). While some would argue that severe penalties do not always deter crime, or that increasing penalties are unlikely to achieve a commensurate decrease in crime, one should not ignore the potential usefulness of punishment for economic crime (Grabosky, 2001, 158).

- Trainings and evaluation of experts who participate in the detection and prosecution of perpetrators of criminal offenses against the economy. This is necessary because the ways in which criminal offenses of economic crime are committed in modern conditions are increasingly complex, perfidious and increasingly difficult to detect and prove (Tanjević, 2018, 237). The reasons for this are continuous adaptation to new circumstances such as changes in socio-economic relations, legal regulations, as well as the development of technical achievements. That is why it is necessary that the state is always ahead of crime, and this is achieved by applying modern achievements, improved material and technical means in investigative activities, as well as constant training of all participants in criminal proceedings. This particularly applies to state bodies "which in their daily work come across information relevant to investigations" (Strategy of Financial Crime Investigations for the period from 2015 to 2016, Official Gazette of the RS No. 43/2015) of economic crime and which are instructed to cooperate with the police and judicial authorities.
- Effective horizontal and vertical cooperation between relevant institutions responsible for collecting data and conducting investigations (police, competent prosecutor's office, courts and other state bodies and institutions of regulatory and supervisory bodies).
- Increasing the salary of state and municipal officials who work to detect and prosecute criminal offenses against the economy.
- Raising awareness among the population about possible ways of committing criminal offenses in the field of economy, which would report them if there are grounds for suspicion. Within the framework of preventive measures, this measure represents a key element in the comprehensive formation of economic and legal awareness of the population.
- Simplification and automation of procedures for the provision of all types of services (either state or municipal) in order to reduce opportunities for corruption schemes. The transparency of the procedure must be in the first place, which is the basic condition for reducing corruption. Economic growth is lower in countries where corruption is more developed (Čudan, Kekić & Dimitrijević, 2023, 13).

By applying these and various other measures to combat economic crime, we will have a reduced dynamic of criminal offenses against the economy, a reduction in material damage to the state and society, as well as a reduction in the enormous economic benefits that various criminal organisations achieve through their activities in the field of economic crime. Achieving these tasks is possible, among other things, with the application of quality legal and by-law solutions and other legal acts. "This creates the foundations of legal security, which is the main component of a quality business environment" (Dašić, Župljanić & Pušonja, 2023, 106). As a consequence of the implementation of modern measures, there is an increase in the trust of citizens in the state apparatus, primarily due to efficient processing, adjudication and confiscation of property benefits resulting from criminal offenses against the economy. Taking into account the above, special attention must be paid in the future to the prevention and suppression of all types of economic crime as a factor endangering the economic security of the country.

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MISDEMEANOR LAW PROTECTION OF PUBLIC ORDER: STATE AND TRENDS IN SERBIA

Branko Leštanin
Ministry of Interior of the Republic of Serbia

Željko Nikač, PhD[1]
University of Criminal Investigation and Police Studies, Belgrade, Serbia

INTRODUCTION

One of the basic functions of the police in all countries is to maintain public order (and peace). In Serbia, this function of the police is normatively realized through the police work on 'maintenance of public order and peace' (Art. 30, Para. 3, l. 5 of the Serbian Police Law). Also, this role of the police is reinforced by the existence of a systemic law regulating public order and peace in Serbia, namely the Public Order and Peace Law, Official Gazette of RS, No. 6/2016 (hereinafter: ZJRM/2016). Maintaining public order means preventing public order from being disturbed, or reestablishing already disturbed public order. This police work is primarily carried out by the uniformed police through patrol and permanent control center activities. (Author1, Author 2, 2016: 42).

Violence is increasingly penetrating our society and all socio-economic levels, religious beliefs and cultural backgrounds. Violence affects our lives, homes and society (Bašić, 2010: 284). When infringements of public order and peace reach extreme proportions and become large-scale violations (large-scale demonstrations, social unrest, civil disobedience, riots at sports and other events, etc.), they represent a very significant form of endangering internal security (Đukić, 2019: 70). On the other hand, each country should prevent its citizens from participating in the disruption of public order and violence in another country (Janković, Otašević, 2023: 399).

Protection of public order and peace in Serbia is the subject of several legal regulations, but ZJRM/2016 is a systemic act in this area. From the beginning of the creation of Serbian statehood, there was a need to protect public order, to achieve a harmonized system of exercising human rights and freedoms. In relation to the Public Order and Peace Law, Official Gazette of RS, No. 51/1992 (hereinafter: ZJRM/1992), the new law introduced new misdemeanors, whereas some earlier ones were abolished; misdemeanor sanctions were tightened for some misdemeanors, while some misdemeanors suffered certain, not only formal, but also essential changes. Probably the most important novelty introduced by the ZJRM/2016 is the requirement that every misdemeanor must be committed in a public place. The main goal and intention of the legislator was to improve the situation in this area with the new law, in a more systematic way, based on the previous experience and practice of the competent entities (Skakavac, 2017: 85). Others believe that the adoption and implementation of the ZJRM/2016, was a huge turnaround for the state in the area of protecting citizens from illegal behavior that was previously sanctioned as misdemeanor and that now the police are not able to fully ensure the safety of citizens. The most important reason for this is the restriction in ZJRM/2016 where the misdemeanor must be committed in a public place (Marković, 2017: 303-304). Some scholars believe that misdemeanors against public order and peace must concern the public or legal order in general, including

1 zeljko.nikac@kpu.edu.rs

all violations of that order and equally protecting the rights of all citizens, regardless of where the violations are committed, whether in a public place or elsewhere. Otherwise, there is no protection of the freedoms and rights of citizens and the legal order does not work (Delibašić, 2017: 465).

For the past two decades, the police in Serbia have been introducing new policing models such as community policing[2], intelligence-led policing[3], problem-oriented policing[4], etc. In this regard, this paper can show how the application of these models affected the state and trends of public order (and peace). The main goal of this paper is to explore the protection of public order from the misdemeanor - legal, comparative, theoretical and empirical aspect. The authors placed their research in a spatial context related to the territory of the Republic of Serbia and in a time frame in the period from 2018 to 2023. This period was chosen as the beginning of the research because it also represents the beginning of the implementation of the ZJRM/2016.

METHOD

The authors use the normative method to analyze the norms of the law. The authors will present and analyze statistical data and numbers related to the state and trends of public order protection from the aspect of misdemeanor law. For these purposes, the authors use data from the Ministry of Interior of the Republic of Serbia for the period 2018-2023. Data from the Statistical Offices of Serbia, Croatia and Montenegro related to the number of inhabitants were also used. Comparative method will be used for exploring the public order norms in some other states. Thus, several parameters were identified that will be the subject of analysis: 1) Total number of misdemeanors (without traffic safety); 2) Total number of public order (hereinafter: PO) misdemeanors; 3) Participation of PO misdemeanors in the total number of misdemeanors; 4) Rate of PO misdemeanors; 5) Spatial (nominal) distribution of PO misdemeanors; 6) Spatial distribution of PO misdemeanors by rate; 7) PO misdemeanors according to the legal types; 8) Prostitution; 9) Violence and fighting; 10) Insulting an official; 11) Characteristic places of PO misdemeanors; 12) Characteristic time during the day of PO misdemeanors; 13) Perpetrators of PO misdemeanors by gender and age; 14) Adult perpetrators of PO misdemeanors according to age; 15) Juvenile perpetrators of PO misdemeanors according to age; 16) Decisions of Misdemeanor Courts upon police requests for initiation of misdemeanor proceedings for PO misdemeanors; and 17) Types of misdemeanor sanctions imposed in the first instance and Misdemeanor Appellate Court.

FINDINGS

As can be seen from Figure 1, the total number of misdemeanors in Serbia (without traffic safety misdemeanors) varies from year to year. The average number of misdemeanors in the observed period was 56,650, where only in 2020, a huge increase in misdemeanors by about 20% can be observed, but after that the situation calms down. Generally speaking, the number of misdemeanors in Serbia was decreasing in the observed period. Several hypotheses can be raised here that could be resolved by further research. Such trends are the result of the increased involvement of the police in detecting misdemeanors, but at the same time, the impact of the penal policy on the perpetrators of violations.

2 Further readings: Author2, Author1, 2019; Milojević, Janković, Milojković, Djukanović, 2017; Jankovic, Cvetkovic, Ivanovic, Ivanov, Jovanovic, Otasevic, 2023

3 Further readings: Đurđević, Author1, 2017

4 Further readings: Author2, 2019

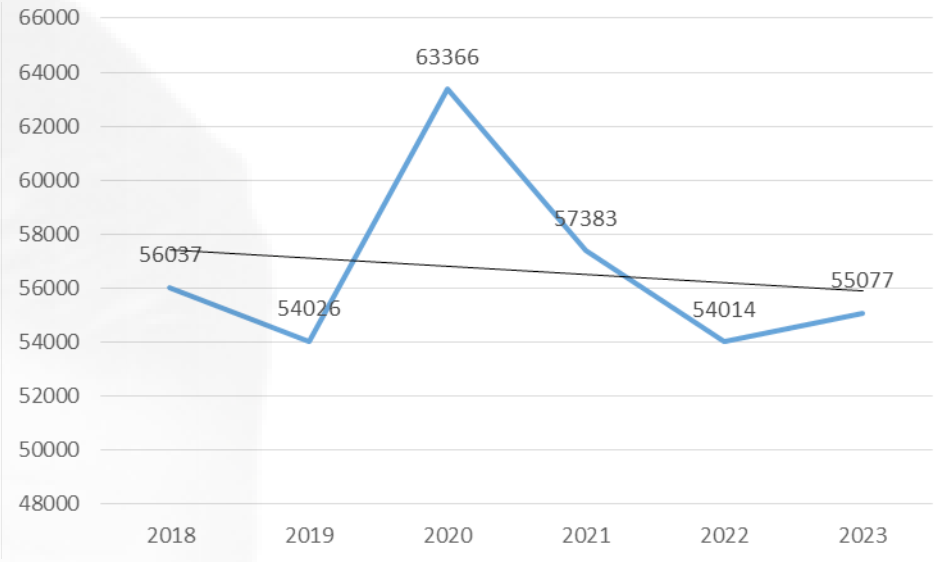


Figure 1. *Total Number of Violations (Without Traffic Safety) in the Period 2018–2023*

If we look at the total number of PO misdemeanors in the period 2018-2023, a constant trend of decreasing nominal number of misdemeanors can be observed (Figure 2). The trend of a decrease in the number of PO misdemeanors was also recorded in other researches of this problem in the previous period when ZJRM/1992 was in force (Skakavac, 2017: 80), and in Croatia (Peulić, Matijević, Palić, 2022: 56; Juras, Marendić, Doljanin, 2023: 128). The average number of PO misdemeanors in Serbia is about 22,500, which is almost by a half less than in the previous period, while in Croatia it is around 16,500, which is significantly less. Therefore, the hypothesis about the 'apparent usefulness' of ZJRM/2016 put forward by Marković (2017: 304) may have been confirmed. However, citizens' subjective sense of security should be examined in another way (survey, interview, etc.).

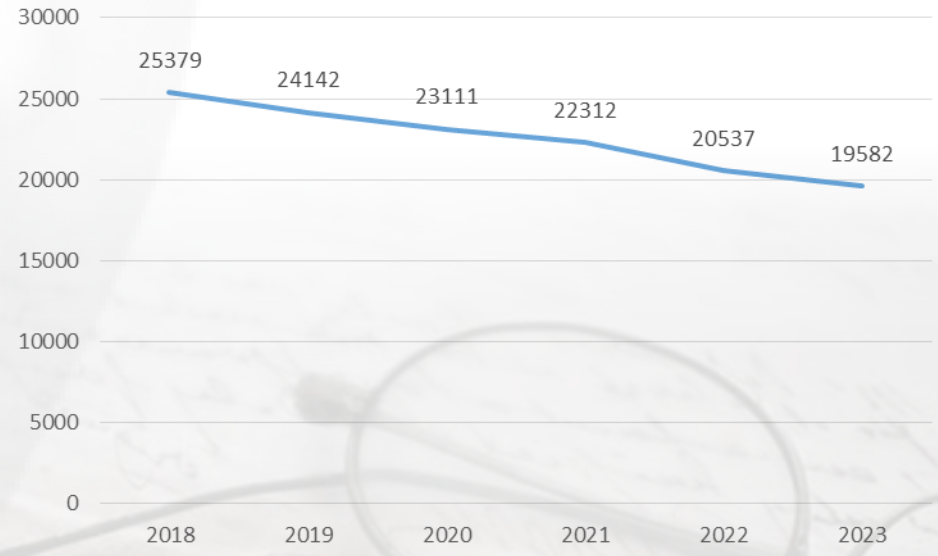


Figure 2. *Total Nnumber of PO Misdemeanors in the Period 2018–2023*

Bearing in mind the previously stated, i.e. different trends, it was necessary to investigate the participation of PO violations in the total nominal number of violations. Figure 3 shows us different trends

of participation, where the highest participation of PO misdemeanors is in the initial years of the research, but later it decreases. The average participation of PO misdemeanors in the total number of misdemeanors is about 40%. Research into misdemeanors in the area of weapons and ammunition showed that their participation in the total number of misdemeanors was only 6%, but in 2023 it increased significantly to almost 10% (Author1, Author2, 2024). Misdemeanors in the area of private security only account for 2.5% of the total number of misdemeanors (Author1, Author2, 2022: 579). As can be seen, PO misdemeanors have priority over other misdemeanors detected by the police (authors emphasize that traffic safety misdemeanors are not taken into account in this research). An analysis of other researches on the state and trends of PO misdemeanors (Skakavac, 2017; Arsović, 2017; Đukić, 2019; Peulić, Matijević, Palić, 2022 and Juras, Marendić, Doljanin, 2023) concludes that the researchers did not deal with the participation of PO misdemeanors in the total number of misdemeanors.

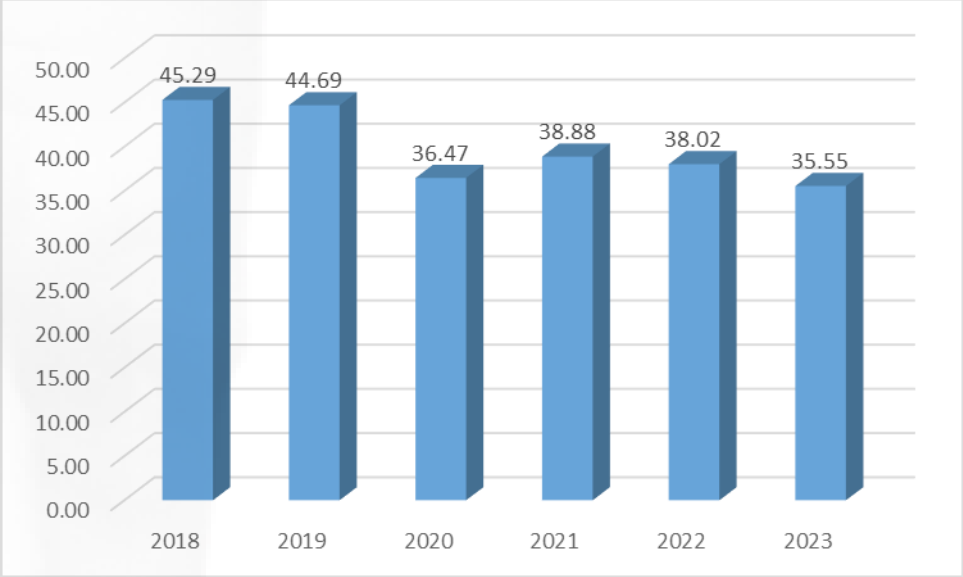


Figure 3. *Participation of PO Misdemeanors in the Total Misdemeanors in the Period 2018–2023*

In order to obtain a complete picture of the state of public order in Serbia, the authors connected the trends of nominal numbers of PO misdemeanors with the movement of the number of inhabitants in Serbia in the observed period in order to obtain the rate of PO misdemeanors[5]. According to Figure 4, the rate of PO misdemeanors in Serbia is decreasing from year to year. The average rate of PO misdemeanors is around 330, which is significantly lower compared to the period when ZJRM/1992 was applied, when the rate of PO misdemeanors was around 600 (Skakavac, 2017: 80). The analysis of other researches in the field of public order (Skakavac, 2017; Arsović, 2017; Đukić, 2019; Peulić, Matijević, Palić, 2022 and Juras, Marendić, Doljanin, 2023) showed that researchers did not deal with the rate of PO misdemeanors. If, however, the nominal values from Croatia and Montenegro are applied and brought into relation with the movement of the number of inhabitants[6], we get the average rate of PO misdemeanors in Croatia of almost 415 and in Montenegro around 125 (Arsović, 2017; Peulić, Matijević, Palić, 2022: 56 and Juras, Marendić, Doljanin, 2023: 128). This means that Montenegro has a more favorable state of public order than Serbia, while the situation in Croatia is the least favorable.

5 https://www.stat.gov.rs/sr-Latn/oblasti/stanovnistvo/procene-stanovnistva Accessed on April 10th, 2024

6 https://podaci.dzs.hr/hr/podaci/stanovnistvo/procjena-stanovnistva/ and https://monstat.org/cg/page.php?id=534pageid=322 Accessed on April 10th, 2024

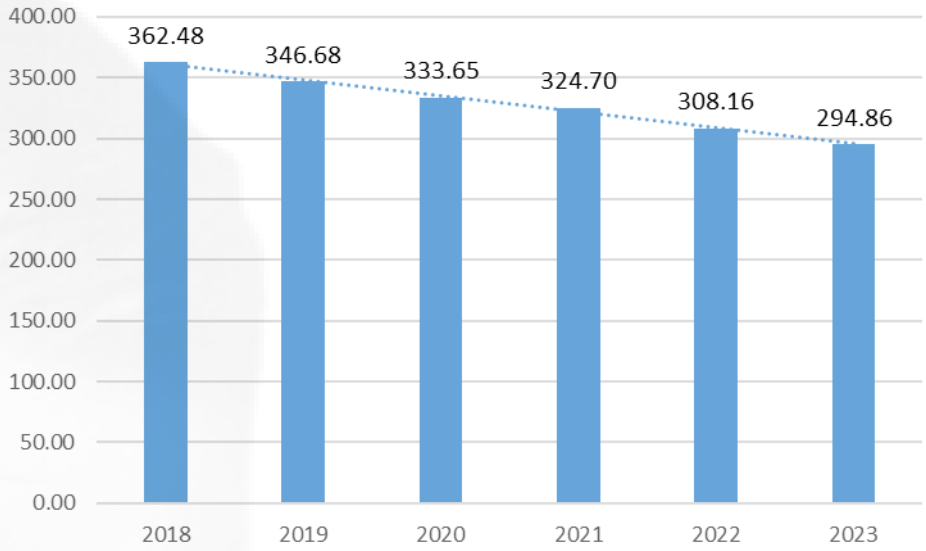


Figure 4. *PO Misdemeanors Rate Between 2018 and 2023*

In order to facilitate the collection and processing of data, the territory of Serbia is divided according to the jurisdiction of police departments (Police Department for the City of Belgrade and 27 regional police departments). According to the nominal numbers, the most PO misdemeanors were committed in the area of Police Department (hereinafter: PD) the City of Belgrade (34%), followed by the Novi Sad PD with 9%, the Niš PD with 5%, Kragujevac PD with 4% and other PDs with 3% participation or less (Figure 5). Zagreb, as the capital of Croatia, also records the nominally highest number of PO misdemeanors (Peulić, Matijević, Palić, 2022: 56-57). Research conducted during the implementation of ZJRM/1992 shows partially different trends, as Belgrade, Novi Sad and Niš PDs are in the first three places, followed by Šabac, Jagodina and Zrenjanin PDs (Đukić, 2019: 79). Observing the nominal values in the area of Novi Sad PD, a decrease in the number of PO misdemeanors by 50% is observed compared to the period of application of ZJRM/1992 (Skakavac, 2017: 80). Novi Sad PD nominally has fewer committed PO misdemeanors than the Split-Dalmatia PD in Croatia (Juras, Marendić, Doljanin, 2023: 130).

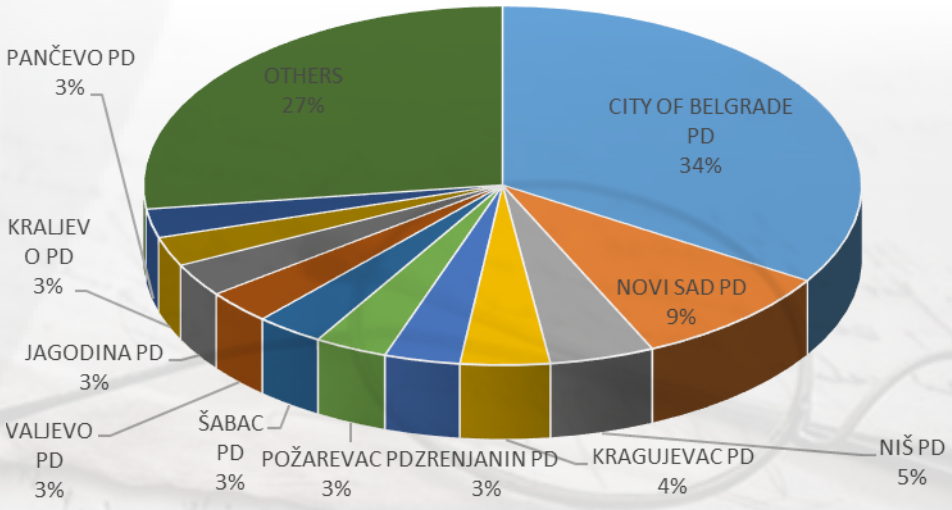


Figure 5. *Spatial (Nominal) Distribution of PO Misdemeanors Between 2018 and 2023*

Nominal values when researching the state and trends of some criminal phenomena can mislead the researcher. Therefore, the authors explored the spatial distribution of PO misdemeanors according to the misdemeanor rate where the results are significantly different (Figure 6). Zrenjanin and Šabac are the regional police departments in Serbia with the worst rate of PO misdemeanors, followed by the City of Belgrade PD, Valjevo and Kikinda PD. PDs with the most favorable rate of PO misdemeanors include Sremska Mitrovica, Novi Pazar and Čačak.

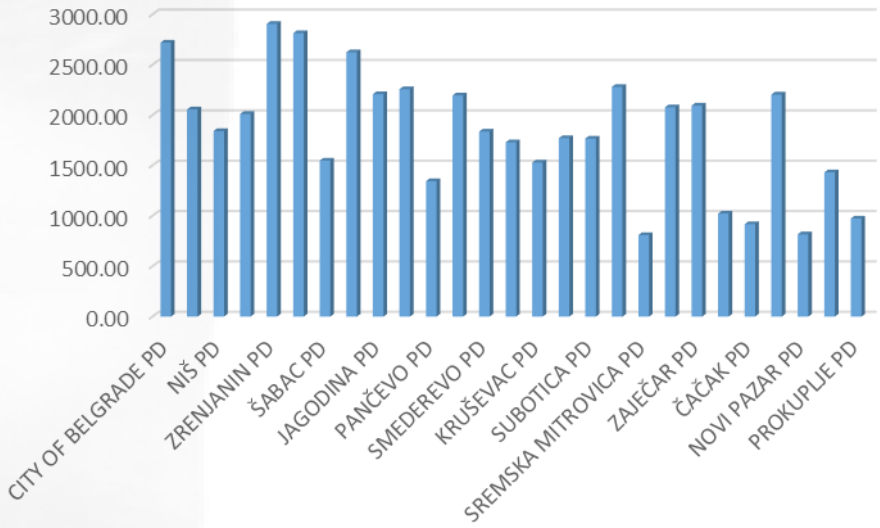


Figure 6. *Spatial Distribution of PO Misdemeanors by Rate Between 2018 and 2023*

The Serbian legislator groups several PO misdemeanors in one provision according to their danger to society and issues the punishment accordingly. If we look at the misdemeanors according to the division from the ZJRM/2016, we can see that in the observed period, the dominant misdemeanor is Insulting, Using Violence, Threatening or Fighting[7] (Art. 9) with 61%, which, considering the issued penalties, can be considered the most serious misdemeanor (Figure 7). Immediately following is the misdemeanor of Indecent, Insolent and Reckless Behavior[8] (Art. 8) with 17%, then Quarreling, Yelling and Noise in a Public Place[9] (Art. 7) with 8% and Insulting an Official in the Performance of Official

7 Insulting is defined as belittling the personality (honor and reputation) of another person, committing violence is the use of physical or other force on the body of another person where the force must be capable of causing suffering or pain, threatening is defined as making it appear that evil will be done, that is, to attack the life or body of a person or a person close to someone, while a fight represents the infliction (author's note: exchange) of punches with the hand, other parts of the body or items between two or more persons (Art. 3 Para. 1 ZJRM/2016)

8 Indecent, insolent and reckless behavior is defined by the Serbian legislator as the behavior of a person or the taking of actions in a public place which endangers the safety of citizens or violates public order and peace, offends the morals of citizens, destroys or damages property (Art. 3 Para. 1 ZJRM/2016). Such a definition can be criticized as too general because it does not refer to any specific action, such as a fighting. However, it is precisely the general nature of legal norms that comes to the fore here, as this misdemeanor includes a wide range of prohibited behaviors that threaten public order. A study in Croatia showed that the legal descriptions of the offenses of Fighting, Quarreling and Noise on the one hand and Insolent and Indecent Behavior on the other hand are flawed and unclear and that there is a collision between their applications, because there is no clear boundary of the legal description, especially in physical attacks (Filipović, 2014: 52). The difference between indecent behavior and insulting is that indecent behavior is not directed towards a specific person, but is a question of general socially unacceptable behavior (Tukar, 2019: 24, 81). In reckless behavior, as the word itself suggests, a certain degree of arrogance or audacity must be observed in order for that behavior to be characterized as reckless. Insolent and reckless behavior are manifested in a similar way, but they differ in the intensity of the illegality of the action and the subjective feeling of the victim about the threat to his/her person or property.

9 Quarreling is defined in the law as a verbal conflict between two or more persons, yelling is considered as a verbal expression of high intensity, while noise is considered an unwanted or harmful sound with high intensity (Art. 3 Para. 1 ZJRM/2016)

Duties[10] with 5% of the total number of PO misdemeanors. This trend of participation existed before (Skakavac, 2017: 80) with the exception that the misdemeanor of Insulting an Official did not exist at all in ZJRM/1992, as it was considered as a felony.

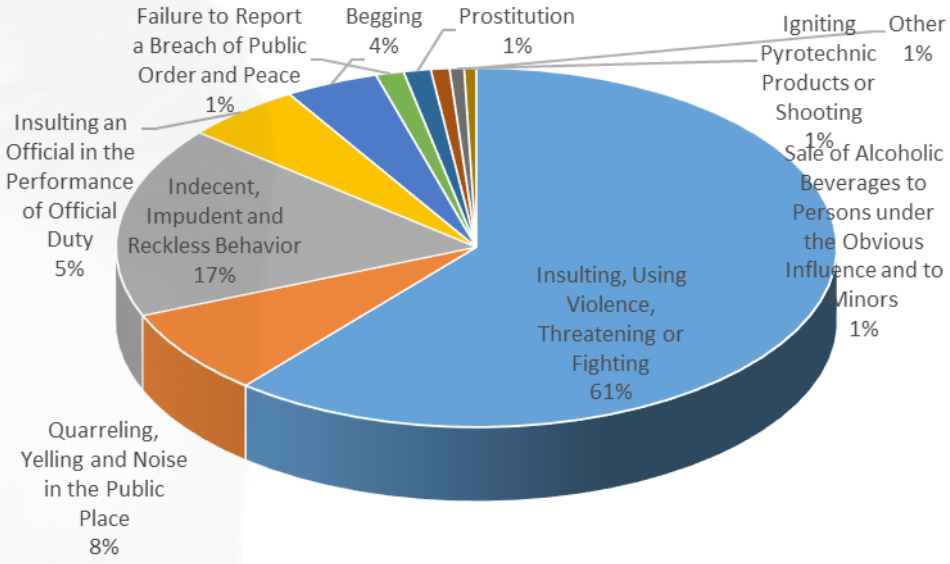


Figure 7. *PO Misdemeanors According to Legal Types in the Period 2018–2023*

The provisions of ZRJM/2016 observe prostitution as the provision of sexual services for payment in money or other value (Art. 3, Para. 1 of the ZJRM/2016). This 'moral' misdemeanor is subject to wide scientific and professional criticism, especially regarding demands for the decriminalization of prostitution and greater protection of women. Historically, in prostitution, women have always borne the burden of punishment, inequality, moral condemnation and etiquette (Pejović, 2020: 84). However, it should be added here that others also suffer the same consequences, where as an example the authors emphasize the transgender persons engaged in prostitution. Kovačević (2016: 66) considers it surprising that an agreement between persons on the provision of sexual services on a commercial basis, which as a rule takes place discreetly, through a conversation between two people, can be considered a disturbance of public order. Likewise, regarding the renting of an apartment as a citizen's property for sexual enjoyment ('prostitution as a profession'), this author believes that it can hardly be legally explained as a disturbance of public order and that, if the principle of banning and sanctioning prostitution is maintained, this should be done through criminal legislation.

One research showed that international documents suggest that the demand for commercial sex is the main factor that affects the increase in prostitution, which was not taken into account when adopting ZJRM/2016 (Pejović, 2016: 335). Slavković (2015: 377) believes that when regulating prostitution, attention must also be paid to its harmful consequences, such as the spread of venereal diseases, negative impact on family relationships, oppression of women, participation of minors, etc. Observing the comparative legal literature, three systems of regulation of prostitution are recognized: prohibitionist[11], abolitionist[12] and reglementory[13]. The prohibitionist system in EU countries is present in

10 The misdemeanor of Insulting an Official consists in belittling the personality of an official during the performance of official duties. In addition to police officers, communal militiamen, officers of inspection authorities and other competent authorities enjoy enhanced legal protection according to and within the scope and of the law.

11 A system of norms that completely prohibits prostitution as a negative social phenomenon.

12 A system in which there are no legal norms on prostitution.

13 A system in which prostitution is observed as a legal economic activity.

Romania, Lithuania and Croatia. This system exists outside the EU in Serbia and Russia. Belgium[14], Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Italy, Ireland, Luxembourg, Malta, Poland, Portugal, Slovakia, Slovenia and Great Britain inherit the abolitionist system of regulating prostitution. Finally, the reglementory system is present in Austria, Greece, the Netherlands, Latvia, Hungary and Germany (Pejović, 2016: 332; Slavković, 2015).

Prostitution as misdemeanor in Serbia only accounts for 1% of the total number of PO misdemeanors (Figure 7). Figure 8 shows the situation and trends in the area of prostitution in Serbia. As can be seen, at the beginning of the implementation of the new law, an increase in the number of misdemeanors was observed, but in later years it declined. The average nominal number of prostitution misdemeanors in Serbia in the observed period is 274, while in Croatia it is only around 9 (Juras, Marendić, Doljanin, 2023: 128). In the previous period, the average was significantly higher both in Serbia (about 390) and in Croatia, where there were slightly more than 160 violations (Spasić, 2006: 172; Mihaljević, 2023: 213).



Figure 8. *Prostitution as a Misdemeanor in Serbia Between 2018 and 2023*

One of the most serious misdemeanors in ZJRM/2016 is Insulting, Using Violence, Threatening or Fighting, which is also the most prevalent in the observed period. What can be considered favorable is the decreasing trend of this misdemeanor in Serbia in the observed period (Figure 9). However, this misdemeanor contains four different acts, that is, four different misdemeanors that are observed as a group because statistically they are not separated, so it was not possible to explore them separately. The police must pay particular attention when initiating misdemeanor proceedings to make a clear distinction between violence and fighting. For violence, there is a clear line between the abuser and the victim, as one party applies force while the other endures suffering, pain or restriction of certain freedoms. Violence can be a prelude to a fight, but fight represents mutual exchange of punches with hand, parts of the body and/or objects. This type of misdemeanor recorded a declining trend in the previous period in Serbia (Skakavac, 2017: 80; Đukić, 2019: 80) but also in Croatia (Juras, Marendić, Doljanin, 2023: 128) and Montenegro (Arsović, 2017). This indicates that the preventive policing through constant presence in public places gives good results in maintaining stable public order.

14 Read more about new trends in the legal regulation of prostitution in Belgium in Hausman, 2024.

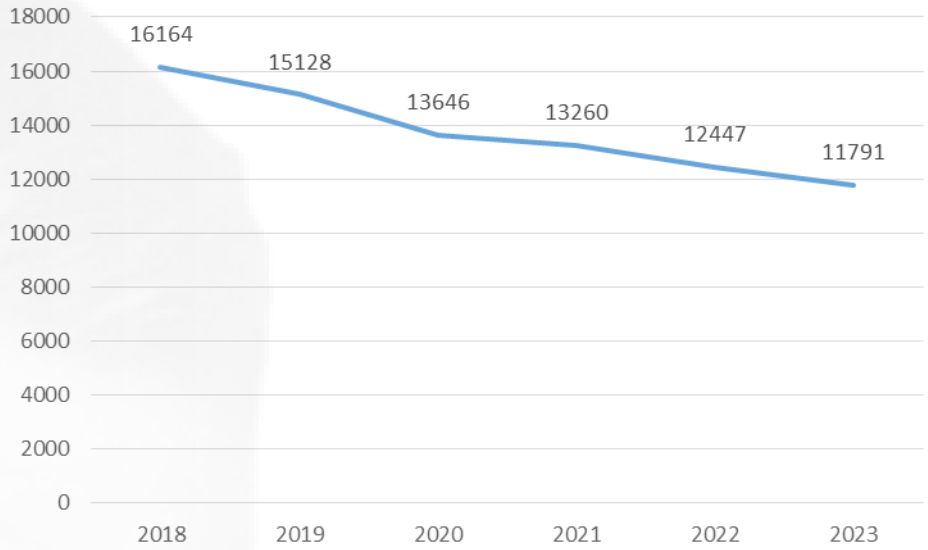


Figure 9. *Insulting, Using Violence, Threatening or Fighting Between 2018 and 2023*

The revision of public order regulations carried out in 2016 resulted in the partial decriminalization of insulting an official, where such illegal behavior was 'lowered' from the level of a felony to the level of a misdemeanor. During the process of decriminalization, the Ministry of Interior of Republic of Serbia, as the proposer of the law, had in mind the complexity and length of the criminal procedure, as well as the consequences caused by this action, so it believed that the decriminalization of this action would ensure the efficiency of the procedure and the actions of the judicial authorities in imposing the issued sanction[15]. Looking at the comparative law, apart from Serbia, this action has been decriminalized and is a misdemeanor in Croatia, Bosnia and Herzegovina (e.g. the Republic of Srpska and Canton of Sarajevo), North Macedonia, Montenegro and Slovenia. Viewed more broadly, this behavior is a misdemeanor in Italy, Finland and France, in Slovakia it is still considered as a felony, while in Bulgaria and Luxembourg it is not explicitly issued as a punishable offense (Peulić, Matijević, Palić, 2022: 60). As can be seen from Figure 10, this misdemeanor experienced a sudden jump in the first three years of the law's implementation, but later the situation improved. In general, this misdemeanor is on the decline, and on average, around 1,200 insults to officials are committed annually in Serbia. This is significantly fewer compared to Croatia, where on average around 1,700 misdemeanors of insulting officials are committed during the year (Juras, Marendić, Doljanin, 2023: 128), while only 80 of these misdemeanors are committed in Montenegro (Arsović, 2017). What is interesting is that the parable of insulting officials is identical to the parable of the total number of violations (Figure 1), which leads to the conclusion that this misdemeanor significantly influenced the state and trends of the total number of misdemeanors in Serbia.

15 http://www.parlament.gov.rs/akti/zakoni-u-proceduri/zakoni-u-proceduri.1037.html Accessed on January 2nd, 2016

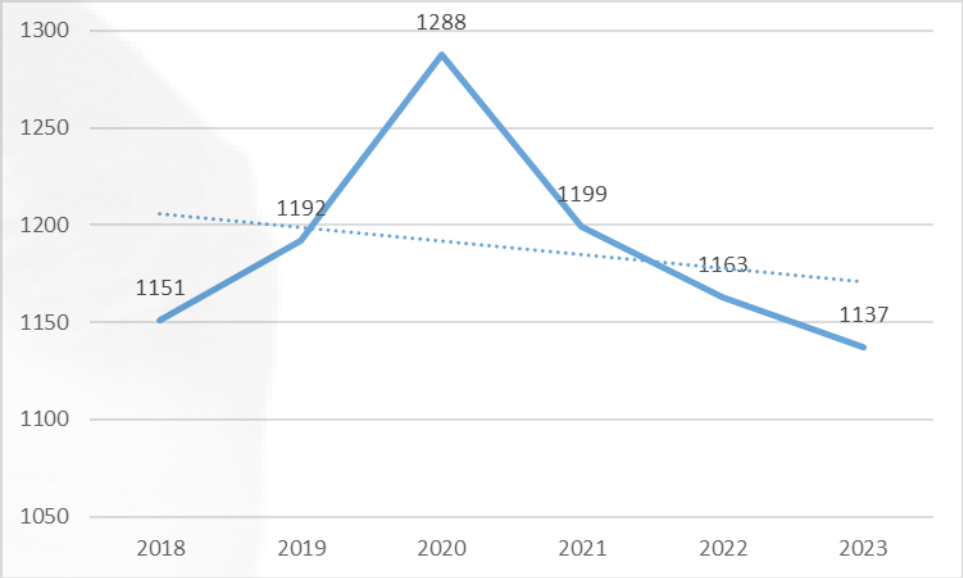


Figure 10. *Insulting an Official in the Period 2018–2023*

Analyzing PO misdemeanors by place of commission, the observed trend shows that most misdemeanors are committed on the streets or squares (44%), in catering facilities (12%), only 3% in a house or apartment, while other places accounted for only 1% or significantly less (Figure 11). This trend was also observed in Croatia (Juras, Marendić, Doljanin, 2023: 131; Peulić, Matijević, Palić, 2022: 57). In the previous period in Serbia, relatively the same trend was observed when it comes to the places of commission (Skakavac, 2017, 82; Đukić, 2019: 81), with the fact that due to the revision of the law, there is a decrease in PO misdemeanors in houses because they are not a public place.

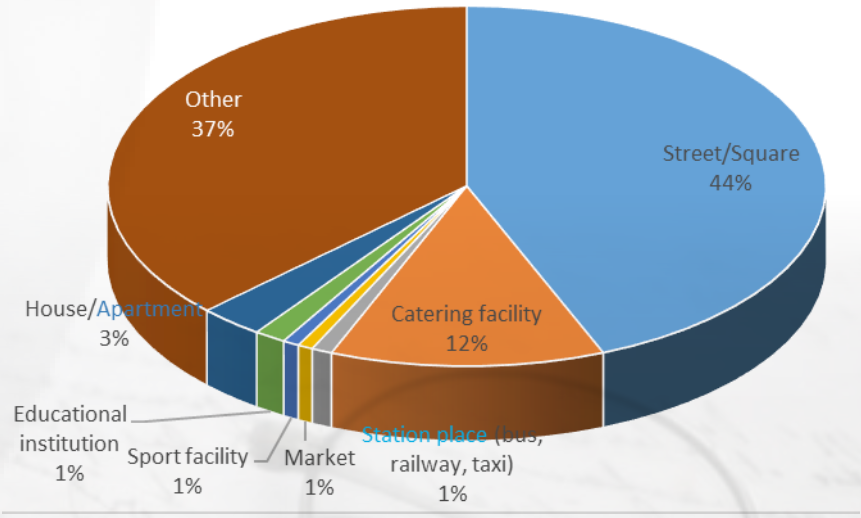


Figure 11. *Characteristic Places of Disturbing of Public Order in the Period 2018–2023*

The trends regarding the time of disturbing public order are relatively even, with the early morning hours being distinguished by the fact that they are not characteristic for disturbing public order (Figure 12). Public order is most often disturbed in the period from 12-6 PM (31%) and then in the night hours from 10 to 6 AM (29%). Such trends were also observed in the previous period in Serbia (Skakavac, 2017: 83; Đukić, 2019: 81), but there are no data for Croatia in the literature.

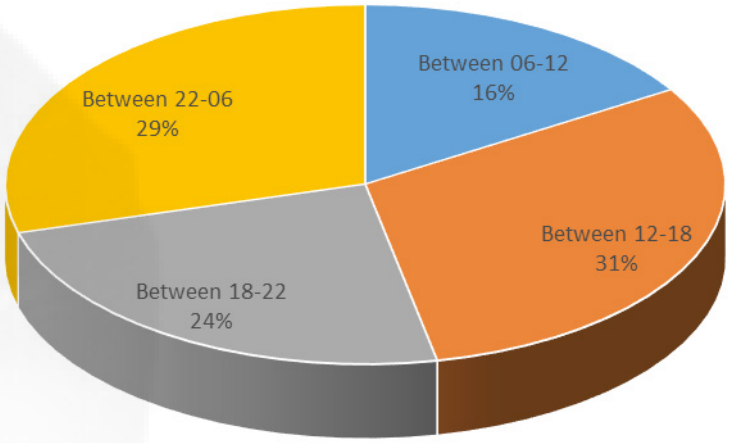


Figure 12. *Characteristic Time During the Day of Disturbing of Public Order in the Period 2018–2023*

If we pay attention to the offenders by gender, we can see that there are significantly more men (83%) than women (17%), while by age there are significantly more adult offenders (94%) than minors (6%). Observed in relation to the previous period, there have been no significant differences except for the fact that a shift in terms of gender can be observed in favor of women, whose participation as the perpetrators of PO misdemeanors has dropped by 1% (Skakavac, 2017: 83; Đukić, 2019: 81). Such trends can also be observed in Croatia, with the fact that minors participate with only 1% in the execution of PO misdemeanors (Juras, Marendić, Doljanin, 2023: 131).

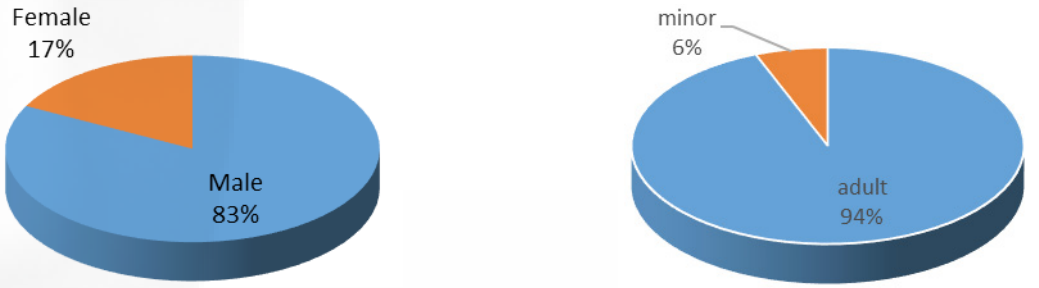


Figure 13. *Perpetrators of PO Misdemeanors by Gender and Age Between 2018 and 2023*

If we were to separate adult perpetrators by age, it can be seen that the majority of perpetrators are in the middle age of 21 to 40 (46%), while persons over 40 years of age participate with 35%. It can be considered favorable that perpetrators aged 18 to 21 participate with only 9%. Within this parameter, no significant deviation is observed in relation to the previous period, where the trends are identical in Serbia (Skakavac, 2017: 83; Đukić, 2019: 81) and in Montenegro (Arsović, 2017).

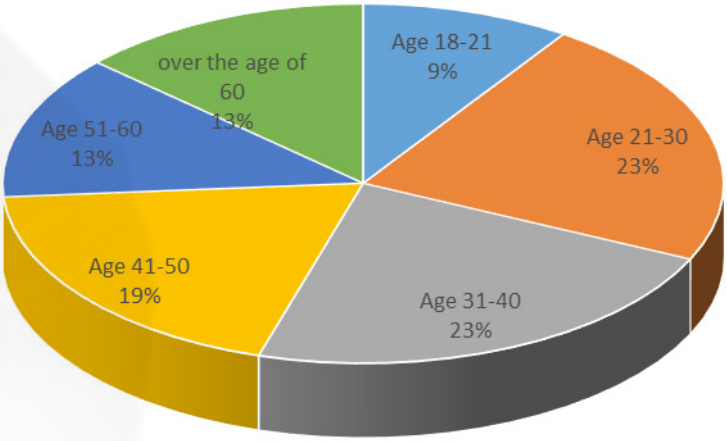


Figure 14. *Adult Perpetrators of PO Misdemeanors by Age Between 2018 and 2023*

On the other hand, if we look at juvenile perpetrators according to their age, a trend can be observed with the majority in the group of older juveniles between the ages of 16 and 18 (66%), which is understandable considering that this group of juveniles visits catering facilities and other gathering places for juveniles where the disturbance of public order occurs. However, the worrying fact is that there is a percentage of children (1%) under the age of 14 who have been registered as perpetrators of PO misdemeanors, even though they cannot be held responsible for misdemeanors.

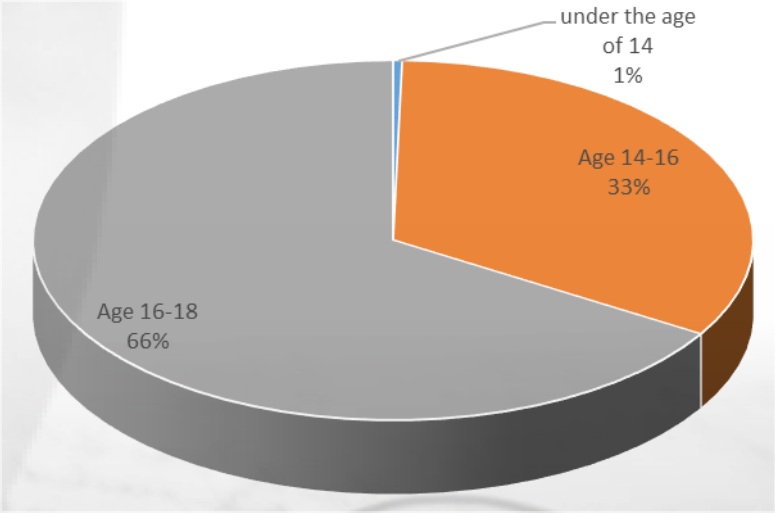


Figure 15. *Juvenile Perpetrators of PO Misdemeanors According to Their Age Between 2018 and 2023*

One of the very important parameters for a complete overview of the state and trends in the area of maintaining a stable public order involves the decisions of the courts in misdemeanor proceedings initiated by the police. Looking at previous research, this parameter, with the exception of Montenegro, was not the subject of research (Skakavac, 2017; Arsović, 2017; Đukić, 2019; and Juras, Marendić, Doljanin, 2023). Figure 16 shows that 50% of the initiated proceedings ended with the conviction of the offender, in 23% of cases the offender was acquitted of charges, while in 13% the proceedings were suspended (obsolescence) and in only 4% the police initiative for misdemeanor proceedings was dismissed. These indicators point to a very good level of cooperation between the police and

misdemeanor judicial authorities in Serbia, which work in a coordinated manner to maintain a stable public order. Also the quality of the initiatives submitted by the police and the evidence collected for this purpose is also good. However, the authors believe that the suspension of the procedure due to obsolescence still has a high prevalence, which should be reduced below 10%.

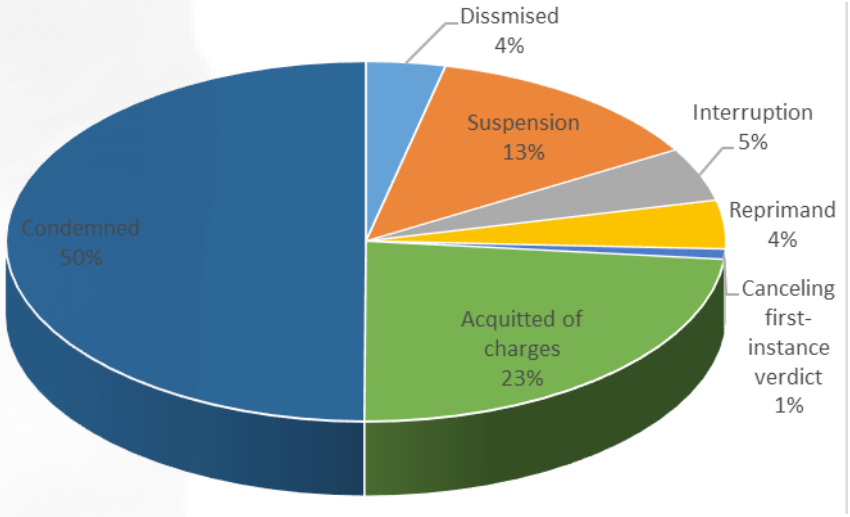
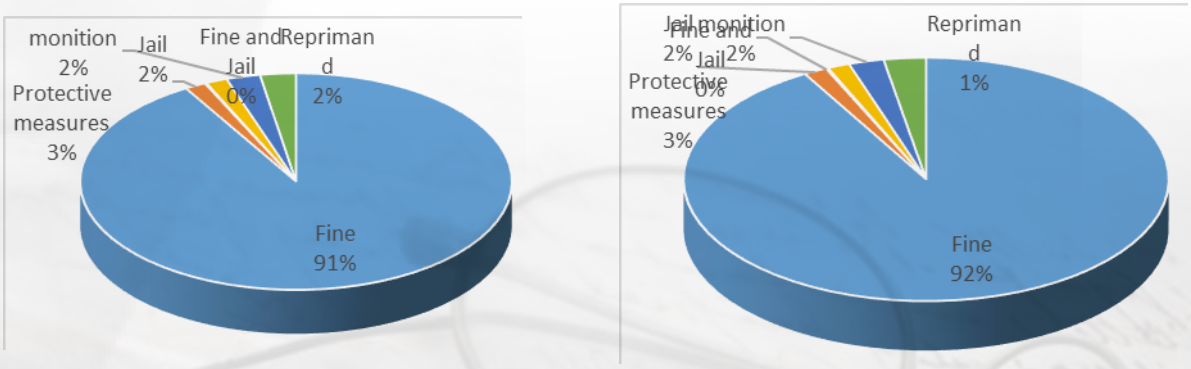


Figure 16. *Decisions of Misdemeanor Courts Based on Requests from the Police to Initiate Misdemeanor Proceedings for Disturbing of Public Order*

The provisions of ZJRM/2016 issue misdemeanor sanctions for misdemeanors ranging from fines to prison sentences with the possibility of imposing other misdemeanor sanctions stipulated by the Misdemeanors Law (reprimand, educational and protective measures, etc.). Comparing the data on the misdemeanor sanctions imposed by the courts in the first instance and the Appellate Misdemeanor Court, we see that there is no big difference and that there has been preference for the imposition of fines (Figure 17). This indicates the mild penal policy of the courts, which has been confirmed in other researches and in some other areas of social life that are protected by misdemeanor law (Marković, 2023; Author1, Author2, 2022; Author1, Author2, 2024). Regardless of that, this kind of penal policy gives results and affects the perpetrators, bearing in mind the trend of the decline of PO misdemeanors.



first-instance verdicts final verdicts

Figure 17. *Types of Misdemeanor Sanctions Imposed in the First and Appellate Degree*

CONCLUSION

Violence is only one segment, one of the ways of disturbing public order (and peace), but, as we could see in this research, public order implies a much wider sphere of social life. The revision of the legal text from 2016 brought not only new misdemeanors but also certain controversies, especially regarding the scope of protection of public order which is limited to public places. Relying on the title of the law, its subject matter, legal tradition and comparative law, the authors believe that the limitation of the protection of public order to a public place is justified. Violence and other forms of endangerment that are not expressed in public should not be outlawed, but there should also be legal protection against such forms of endangerment, but not within the regulations governing public order.

Statistical indicators direct our attention to the fact that the state of public order in Serbia is stable with a tendency to improve. Novelties to the law from 2016 contributed to this, but also the work of the police aimed at maintaining a stable public order. Public order misdemeanors were and remain the dominant form of antisocial behavior on which policing is directed in patrols and hot spots. Comparative legal analysis shows that certain behaviors that endanger public order may differ in the countries surrounding Serbia. Regardless of this, Serbia is one of the countries with a more favorable public order situation.

The research showed that the Zrenjanin and Šabac PDs have the worst state of public order in Serbia, while Sremska Mitrovica, Novi Pazar and Čačak PDs have the most favorable rate of public order. Public order is most often endangered by insulting another person, committing violence against another person, threatening another person or fighting between two or more people. Unfortunately, it was not possible to monitor these types of actions individually in order to determine exactly which one most threatens the peace of Serbian citizens, which should be corrected in the future through the improvement of data storage in the official records of the Ministry of Interior.

Looking at the misdemeanors individually, we see that there are the most disputes in the case of prostitution because there are different systems of legal regulation and, therefore, different attitudes of society towards prostitution. In the period preceding the normative review of the public order, significantly more misdemeanors were found than in the later period, both in Serbia and in other countries. One of the 'new' misdemeanors introduced by the ZJRM/2016 is Insulting an Official. Looking at the state and trends of this misdemeanor, the degree of authority of police officers and the police as a public service can be assessed. In the initial years of the implementation of ZJRM/2016, the degree of authority was low, but a certain balance has subsequently been established and it can be considered that in the following period, citizens' trust in the police will strengthen. What is interesting, if we look at it nominally, is that this misdemeanor has had an effect on the increase of the total number of misdemeanors in Serbia.

In the future, the police activity of maintaining a stable public order should be focused on the streets/squares and catering facilities, where in the afternoon and night hours the presence of police officers in uniform should be increased. As for the profile of the perpetrator, it can be concluded that it is an adult man in middle age, but special attention must be paid to children as potential perpetrators. This is where community policing, school policeman and other projects aimed at preventing misbehavior among children come to the fore (Graduation, lectures in primary and high schools by the police, etc.).

The police should continue good cooperation and coordinated work with the Misdemeanor Courts, with the fact that the Misdemeanor Courts should pay attention to the processing time of cases and reduce the rate of obsolescence of cases in the area of public order.

ORIGINALITY/VALUE

The issue of public order (and peace) is poorly researched in the world, in Serbia and in the surrounding area. With this paper, the authors want to contribute to a better understanding of this issue by looking at all aspects through the prism of misdemeanor law. In this way, the law enforcement authorities (police) will be able to devise new preventive mechanisms in the coming period in order to reduce this problem to the smallest possible extent in Serbia.

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CLASSIFIED DATA AND CRIMINAL LAW – A NEED FOR CERTAIN CHANGES?

Jovana Banović, PhD[1]
Faculty of Security Studies, University of Belgrade, Serbia

INTRODUCTION

There are many "secrets" in the "normative sea", such as state secrets, trade secrets, official secrets, or military secrets. All of these are recognized by various laws in Serbia, which prescribe not only the basic rules but also the consequences of breaching these legal norms. Given that the primary aim of this article is to analyse the legal frameworks related to data secrecy within the context of Criminal Law, the focus will be on specific provisions of the Data Secrecy Law (DSL, Official Gazette RS, 104/2009) and the Criminal Code of Serbia (CC, Official Gazette RS, 5/2005, 88/2005, 107/2005, 72/2009, 111/2009, 121/2012, 104/2013, 108/2014, 94/2016, and 35/2019). Additionally, the Law on Protection of Trade Secrets (LPT, Official Gazette RS, 53/21) and the Law on Personal Data Protection (LPDP, Official Gazette RS, 87/2018) are also part of the aforementioned legal framework, although they will not be subject to further analysis. This normative basis is particularly important for determining what constitutes a secret as an object of criminal law protection (more: Bodrožić & Milošević, 2022: 95-97).

The formal and substantial similarity between Article 98 of the DSL, which addresses the disclosure of classified data, and Article 316 of the CC, which pertains to the disclosure of state secrets, contributes to the consistency of the Serbian legal system and warrants further analysis. Part of the research will include several additional offenses related to data protection, specifically their particularities, as prescribed by the CC.

There are at least two reasons for choosing this topic. The first, more general reason is to highlight the importance of protecting data, especially classified information that is vital to national security, public safety, defense, and both internal and foreign affairs of the Republic of Serbia. The second reason is to expose certain inconsistencies within the domestic legal system, which have led to the existence of two regimes for classified data protection: one before 2009, and another after the DSL came into force.

DESIGN/METHODS/APPROACH

The research paper comprises an introduction, three distinct chapters, and a conclusion. The first section of the article will provide a brief overview of the normative framework, encompassing relevant provisions of the DSL, CC, and relevant bylaws. Following this, in the second chapter, the analysis will focus on two specific offenses: Article 98 of the DSL, which deals with disclosing classified data and Article 316 of the CC, which pertains to disclosing state secrets. Particularly, attention will be paid to aggravated forms of the offense outlined in Article 316 of the CC, which deals with grave offenses against the constitutional order and security of Serbia. Additionally, a concise examination will be conducted on selected aspects of the following offenses: Disclosure of an Official Secret (Article 369 of the CC), Disclosure of a Military Secret (Article 415 of the CC), Unauthorized Disclosure of Secrets

1 jovana.banovic@fb.bg.ac.rs

(Article 141 of the CC), and Violation of Confidentiality of Proceedings (Article 337 of the CC). In the third section of the article, considerations regarding potential legal changes to existing provisions of the DSL and CC will be addressed.

The methodology employed primarily involves content analysis, complemented by the dogmatic method and a conceptual approach, aimed at achieving the primary objectives of the research. Additionally, since this article is based on legal provisions, a normative analysis has been conducted to assess the current state of classified data in primary and secondary criminal legislation, while addressing the challenges posed by contemporary issues and potential future amendments.

SUMMARY OVERVIEW OF THE NORMATIVE FRAMEWORK FOR CLASSIFIED DATA

Primarily, the field of classified data is governed by the Data Secrecy Law. There are several other legal texts that address this matter. In addition to the aforementioned law, our paper focuses on the Criminal Code of Serbia. The main reason for this approach is the criminal law perspective from which we aim to analyse classified data, particularly the sections concerning prescribed offenses in these two laws. It is important to note that the Data Secrecy Law is supplemented by 16 bylaws (Milosavljević, 2016:7). The legal nature of these bylaws is predominantly regulatory. Examples include: the Regulation on Specific Criteria for Determining the Level of Secrecy as "Top Secret" and "Secret"; the Regulation on Specific Criteria for Determining the Level of Secrecy as "Confidential" and "Restricted" within the Security Information Agency, as well as within the Office of the National Security Council and Classified Information Protection; Regulation on Special Measures for the Protection of Classified Information in Information and Telecommunication Systems, among others.

The main subject of the Data Secrecy Law (DSL) is to establish a unified system for the classification and protection of secret data that is of interest to national security, public safety, defense, internal and foreign affairs of the Republic of Serbia, and the protection of foreign classified data. It also regulates access to classified data and their declassification, the competencies of relevant authorities, the oversight of the implementation of law, accountability for non-compliance with its obligations, and other matters important for the protection of data secrecy (Article 1). From our perspective, Article 98 of the DSL is of central importance. It defines the criminal offense of unauthorized disclosure, transfer, or making accessible data or documents that have been entrusted, obtained by other means, or the acquisition of data or documents that are classified as secret, marked with the appropriate level of confidentiality. On the other hand, the Criminal Code (CC) includes Article 316, which addresses the disclosure of state secrets. Particular attention will be paid to the aggravated forms of the offense outlined in Article 316 of the CC, which pertain to serious offenses against the constitutional order and security of Serbia. As previously mentioned, an examination will also be conducted on certain aspects of the following offenses: Disclosure of an Official Secret (Article 369 of the CC), Disclosure of a Military Secret (Article 415 of the CC), Unauthorized Disclosure of Secrets (Article 141 of the CC), and Violation of Confidentiality of Proceedings (Article 337 of the CC).

The DSL is a fundamental law that clarifies the substantive aspects of classified data protection, as well as the basic elements of the aforementioned crimes. However, The CC provides its own definitions for similar offenses, which, whether intentionally or not, ultimately largely align with each other. The DSL is a crucial normative part of data secrecy protection because it establishes the "core" rules for determining what is lawful and, conversely, what is not. It is also an important legal act for the control and classification of data of a certain, "special" form. It is worth emphasizing that, in the realm of informa-

tion protection in cyberspace, international standards, such as the ISO/IEC 2700 series, play a significant role. The international dimension is important not only for cooperation and global security but also for alignment with European legal standards and for addressing new challenges in emerging technologies such as digital assets (Kovačević & Milošević, 2022: 95; Radisavljević, 2023; Banović, 2023a).

DSL provides definitions for certain basic terms. It categorises data into three types: Data of Interest for the Republic of Serbia, Classified Data, and Foreign Classified Data. Article 1 of the DSL establishes the legal meanings of these definitions. Firstly, Data of Interest for the Republic of Serbia refer to "any data or documents in the possession of a public authority that relate to territorial integrity and sovereignty, protection of the constitutional order, human and minority rights and freedoms, national security and public safety, defense, internal affairs, and foreign affairs". Secondly, Classified Data mean "any data of interest for the Republic of Serbia that have been classified and assigned a level of secrecy by law, other regulations, or decisions of a competent authority made under the law". Finally, Foreign Classified Data mean "any data provided to the Republic of Serbia by another country or an international organization, with the commitment that the Republic of Serbia will maintain them as classified; as well as classified data resulting from cooperation between the Republic of Serbia and other countries, international organisations, or other international entities under an international agreement concluded by the Republic of Serbia". Given the topic of the Article and the definitions provided, classified data represent a "vital" category of data that will be the focus of our analysis.

On the other hand, the CC entirely serves as a supporting source in this context, coming into force in cases of the most serious infringements of classified data. This is why we combine these two laws concerning the criminal law aspects. As previously mentioned, the offense of disclosing state secrets and its aggravated forms are a complementary part of the protection of classified data. Essentially, the main difference lies in the formal terminology: the CC addresses state secrets (or military or official secrets), while the DSL concerns classified data that have been designated with a level of secrecy, such as "top secret", "secret", "confidential", or "restricted".

It is clear that our legal system establishes two regimes for the protection of classified data: one before and one after 2009, when the DSL came into force. Unlike the Criminal Code, which defines offenses and the concept of secrets for its purposes, the Data Secrecy Law not only prescribes the offense of "misuse" of classified data but also outlines an entire system for its protection. This includes the purpose, storage, and use of collected data, data classification procedures, authorised personnel, licensing, marking, declassification, protective measures, access to different types of classified data, control and oversight, statutory norms for the Council Office, and more. This is not an unusual legal practice, as modern systems tend to replace the term "state secret" with "classified data" (Donna, 2002: 401; Gál, 2022: 587).

From an organisational perspective, a Higher Court has jurisdiction over the two crimes that form the "core" of this paper – Article 98 of the Data Secrecy Law and Article 316 of the Criminal Code (Article 25, paragraph 1, item 2 of the Law on Regulation of Courts – LRC).

CRIMINAL OFFENSES INVOLVING CLASSIFIED DATA

Article 98 of DSL

This criminal offense from the DSL is referred to descriptively in this paper, as it lacks a specific legal designation. In a sense, this is a distinctive technique characteristic of secondary legislation. The offense includes a basic form, three aggravated forms, and a privileged form.

First, the offense under Article 98 of the DSL can be committed in three alternative ways: (1) when an authorised person, meaning anyone in lawful possession of the data or the document containing the data, makes the data or document available to an unauthorised person; (2) if an unauthorised person, who has unlawfully obtained possession of the secret, transfers the secret to a third unauthorised person; or (3) when an unauthorised person unlawfully acquires data or documents containing secret information (Milošević, 2022: 202). In other words, the criminal offense can be committed by anyone who has access to confidential data or documents, whether the data have been entrusted to them or they have obtained it in another way, and then discloses or transfers that data or those documents to an unauthorised person. The basic and aggravated forms of the offense differ in terms of the classification of secret data. The basic form involves committing the crime with respect to data marked as "restricted" or "confidential", as established by the DSL. For this form, the prescribed penalty is imprisonment for a term of three months to three years. The first aggravated form pertains to data marked as "secret", (prescribed sentence is prison term of six months to five years) while the second involves data marked as "top secret" (with prescribed sentence of imprisonment for a term of one to ten years. The third aggravated form is prescribed as an alternative act of commission and applies to all three of the previous forms, with specific penalties. The qualifying circumstances for this form include: intent for personal gain, the intention to "release or use secret data abroad", or committing the offense during a state of war or emergency (Milošević, 2022: 202). The offender shall be sentenced to prison term of six months to five years for the offense from paragraph 1 of the Article 98, one to eight years for the offense from paragraph 2, and five to fifteen years for the offense from paragraph 3. The privileged form depends on a subjective element and requires negligence as the relevant degree of guilt. Prescribing negligent criminal offenses is common in the field of data protection, especially considering the importance of strengthening security culture in this area (Banović, 2022: 149). For this form, the perpetrator shall be sentenced to imprisonment up to two years for the offense from paragraph 1 of the Article 98, three months to three years for the offense from paragraph 2, and six months to five years for the offense from paragraph 3.

It is important to note that the object of the action – classified data with a specific level of secrecy – is determined under Article 14 of the DSL[2], in conjunction with relevant bylaws issued by the Government. Legally speaking, this pertains to blanket disposition of criminal offenses. In addition to the DSL, which is part of secondary criminal legislation, bylaws can provide further interpretation of the objective elements of these crimes. While this approach to traditional criminal law is not typical, it illustrates how bylaws can function as specific sources of criminal law, although this may present challenges concerning the principle of legality (Vuković, 2021: 8). The situation becomes more complicated when considering Articles 10 and 11 of the DSL, which prescribe the procedures for data classification and the enactment of decisions on determining classification levels. Among other things, these procedures require an assessment of the potential damage to the interests of the Republic of Serbia. However, despite the DSL and relevant bylaws defining the types of classified data, there remains the possibility of a mistake of law, especially in relation to Article 105 of the DSL (for instance, a mistake of law can be applied to situations where the offender does not know that the information or document represents classified data with a relevant level of classification or believes that its disclosure is not prohibited (Donna, 2002: 405)). This article stipulates that data and documents classified under earlier regulations will retain their classification level and type. Furthermore, the heads of public authorities were required to review the classification markings of these data and documents within two years of the Law entry into

2 1) "TOP SECRET", which is designated to prevent the occurrence of non-avoidable severe damage to the interests of the Republic of Serbia; 2) "SECRET", which is designated to prevent the occurrence of serious damage to the interests of the Republic of Serbia; 3) "CONFIDENTIAL", which is designated to prevent the occurrence of damage to the interests of the Republic of Serbia; 4) "RESTRICTED", which is designated to prevent the occurrence of damage to the operations or tasks of the public authority that designated it.

force, as stipulated by the DSL. Even though this term has passed, it still seems reasonable to assert that the legislator's intention to review all previously established security classifications may have been difficult to implement in practice due to the sheer volume and number of classified data and documents (Kovačević & Milošević, 2022: 102). Additionally, this is one of the reasons for further analysing the next offense, as the factual situation creates two regimes of classified data.

The lack of statistical data on the incidence of this offense prevents us from getting a complete picture of its representation in practice, as these data are aggregated with other criminal offenses from special laws (secondary legislation). For illustration purposes, in the rare verdicts we have found, this offense is committed when "the offender unlawfully made available to a third party a document or data that were entrusted to him by his superior, specifically a list of individuals titled 'Supervision and Control of Individuals – ...,' prepared by the Police Administration…, which contains data from the information system of the Ministry of Internal Affairs of the Republic of Serbia. According to Article 6, item 47 of the Mandatory Instructions on Rules and Procedures for Using the Information System of the Ministry of Internal Affairs of the Republic of Serbia, all data contained in the mentioned information system, which fall under the jurisdiction of the state and the ministry, are classified as 'confidential'" (Judgment of the Supreme Court of Cassation of Serbia, KZZ 1120/2019, 17.12.2019).

Article 316 of CC – Disclosing a State Secret

This offense involves a specific object of action: a state secret. The group object of protection is the constitutional order and security of Serbia. The Criminal Code (CC) defines a state secret from both a formal and substantive perspective. In addition to defining what constitutes a state secret, the CC also clarifies what does not qualify as one. According to Article 316, paragraph 5 of the CC, a state secret includes information or documents that are declared as such by law, other regulations, or a decision of a competent authority pursuant to the law (formal aspect), and whose disclosure would or could harm the security, defense, or political, military, or economic interests of Serbia (substantive aspect). Conversely, a state secret does not include information or documents that involve a serious violation of fundamental human rights, undermine the constitutional order and security of Serbia, or are intended to conceal a criminal offense punishable by imprisonment of five or more years. The last one is a situation where something that cannot be classified as a secret becomes a secret. Theoretically, this can be defined as an "illegal secret" (Stojanović, 2012: 851). A similar provision is found in the DSL, specifically in Article 3: data marked as classified for the purpose of concealing a crime, exceeding authority, abusing office, or hiding any other illegal act or proceedings by a public authority shall not be considered classified. Considering the relationship between the definitions of classified data under the Data Secrecy Law and state secrets in the Criminal Code, we can conclude that, in matters of secrecy, the CC employs both formal and material criteria. In contrast, the definition of classified data in the Data Secrecy Law is primarily formal, with an indirect reference to the material element through the specification of different levels of secrecy. However, we should keep in mind that, on the one hand, the DSL came into force after the Criminal Code, and its main purpose was to unify the regulations concerning classified data. On the other hand, the content of Article 316 of the Criminal Code has not been amended since 2009 (even then, the legislator only increased the minimum penalty in Article 316, paragraph 2 of the Criminal Code[3]).

It is correctly observed that the formal process of classification is significant, especially considering historical examples where the substantive element has predominated (Gál, 2022: 593). A substantive approach simplifies the initiation of criminal proceedings but can conflict with the values of legal

3 The 2009 amendments were characterised by a trend of increasing criminal law repression (Bodrožić, 2020: 386).

certainty and predictability, which are essential components of justice. However, the fact that the definition in the Criminal Code includes both elements aligns this area with the concept of *ultima ratio*, as it restricts criminal law protection to only the most serious acts.

Unlike espionage, this offense is "situated" in a "domestic environment", meaning it does not involve any foreign elements (Delić, 2021: 334-340; Milošević, 2022: 203). In some legal systems, there was a distinction between a breach of confidentiality and the disclosure of a secret, which led to a lack of clear differentiation between disclosing a state secret and committing espionage. Both criminal offenses were part of a single one. Later, this ambiguity led to certain reforms in this field (Creus, 1998a: 163-165; Donna, 2002: 405).[4]

Article 316 of the Criminal Code includes a basic form, two privileged forms, and an aggravated form. Article 321 of the Criminal Code – Grave Offenses against the Constitutional Order and Security of Serbia – also references the criminal offense of disclosing a state secret by introducing an additional aggravated form in paragraph 3. We will explore why this presents an issue in the continuation of the paper.

According to Article 316, paragraph 1 of the Criminal Code, this offense can be committed by anyone who, without authorisation, discloses, hands over, or makes available to another person information or documents that are entrusted to them or that they have otherwise acquired and that constitute a state secret. The prescribed sentence is imprisonment for one to ten years. Unlike the basic form, where the perpetrator has authorisation to possess classified data but unlawfully makes it available to a third person, the first privileged form can be committed by anyone who discloses to another person information or documents they know to be a state secret and which they have unlawfully acquired[5]. In this case, the offender shall be punished by imprisonment extending from six months to five years. The

4 This issue may also be relevant under Serbian law, particularly regarding the distinction between aggravated forms of criminal offenses involving the disclosure of classified data or secrets, as defined in the perpetration acts prescribed by Article 98, paragraph 4 of the DSL, Article 369, paragraph 2 of the CC (disclosure of official secrets), and Article 415, paragraph 2 of the CC (disclosure of military secrets). Considering that these criminal offenses are committed "for the purpose of publishing or using abroad", which serves as a qualifying circumstance, a question may arise regarding the distinction between these offenses and the criminal offense of espionage under Article 315, Paragraph 1 of the CC (where the offense is completed by disclosing, handing over, or making available military secrets, economic or official information, or documents to a foreign state, foreign organisation, or person in their service), and particularly the specific form under Article 315, paragraph 4 of the CC (which is committed by anyone who obtains secret information or documents with the intent to disclose or hand them over to a foreign country, foreign organisation, or person serving them), and these forms, given that the type of information (the object of the action) may coincide. This is notably relevant because, in aggravated forms of the aforementioned criminal offenses, the essence lies in preparatory acts raised to the level of perpetration acts. In contrast, in the case of espionage, such actions are otherwise punishable under Article 320, paragraph 1 of the CC (Preparation for Offenses Against the Constitutional Order and Security of Serbia), while in the specific form of espionage under Article 315, paragraph 4, a preparation act is inherently involved (Milošević, 2022: 206-207). However, the main difference is that espionage implies a more direct connection with a foreign country and a stronger foreign element, while the aggravated forms of the mentioned criminal offenses are committed "within the country" and involve a more indirect level of connection with foreign entities. This is reflected both through the use of the broader term "abroad" instead of "foreign country" and the specific aim of disclosure that does not need to be achieved for the offense to exist (although this argument does not apply to the specific form of espionage). The group protective object in the context of teleological interpretation should also not be overlooked. Additionally, in these aggravated forms, the legislator uses the preposition "for (the purpose of)", which is not always unambiguous, as it sometimes equates to intent and sometimes to motive (Delić, 2016: 107). However, this is certainly a subjective element. Due to the difficulties that generally accompany proving subjective elements, and to overcome potential problems that could lead to impunity for certain borderline behaviours that could also seriously endanger the security of the country, such a normative solution – despite certain overlaps and the need for a more detailed analysis – is more comprehensive. This is particularly due to the "dual secrecy regime" established after the adoption of the Data Secrecy Law. Finally, the legal qualification of such behaviours based on this "foreign" element would depend on the circumstances of the specific case, which would enable a more nuanced response to these theoretical dilemma.

5 For example, unlike this provision, with regard to the elements of the crime, the offense of Disclosing a Trade Secret under Article 240 of the Criminal Code does not clearly distinguish between an authorised and an unauthorised person who discloses information (see: Milošević, 2022: 130-132; Banović, 2023b: 266).

primary reason for the difference in the prescribed sentences is that the perpetrator of the basic form has an obligation to maintain a state secret and violates this duty by committing the crime, whereas the offender in the privileged form unlawfully obtained the information or documents (Stojanović, 2012: 850). The secondary difference is noteworthy. Specifically, in terms of the perpetrating act, the basic form of the crime can be committed in various ways: by disclosing, handing over, or making information or documents that constitute a state secret available to another person (paragraph 1), while the first privileged form (paragraph 2) can be committed only by disclosing a state secret (for example: whether orally, in writing, or electronically…). This form of incrimination is more narrowly defined. The consequence is a concrete danger (similar: Donna, 2002: 405). It is interesting to mention that, in some legal systems, a criminal offense exists even when a secret is merely obtained unlawfully, without the requirement that it be disclosed (Donna, 2002: 401). This topic could arise in future discussions about potential amendments (Milošević, 2022: 204).

The second privileged form applies if the basic form of the offense is committed negligently. The prescribed sentence for this form is imprisonment extending from six months to five years. In the context of negligent crimes, it is important to emphasise that the duty of care or confidentiality imposed on the offender, along with the knowledge of the information by an unauthorised person, should be related to causality (Donna, 2002: 410-411).

The qualifying circumstances are prescribed under Article 316 paragraph 3 of CC. It represents either the timing – if the offense is committed during state of war or state of emergency, or the consequence – if it endangers the security, economic, or military power of Serbia. The prescribed penalty is imprisonment for a term of three to fifteen years. This provision would not be disputable by itself if it were not for Article 321, paragraph 3 of the Criminal Code (Grave Offenses against the Constitutional Order and Security of Serbia). Specifically, it prescribes that the penalty specified in paragraph 2 of this Article – which is imprisonment for a minimum of ten years or life imprisonment – shall be imposed on anyone who commits a criminal offense specified in Articles 307, 309 through 311, Articles 314 through 319, and Article 320, paragraph 2 during a state of war, armed conflict, or state of emergency. Since the offense of Disclosing a State Secret is included in this incrimination, it leads to the conclusion that there are two penalty ranges if this offense is committed during a state of war or state of emergency: imprisonment extending from three to fifteen years under Article 316, paragraph 3, and imprisonment for a minimum of ten years or life imprisonment under Article 321, paragraph 3. Additionally, considering the incrimination under Article 98, paragraph 4 of the DSL, which relates to classified data with the level "top secret" (equivalent to state secret under the Criminal Code), there is an additional penalty range: imprisonment extending from five to fifteen years related to the same qualifying circumstances. For example, the Criminal Code does not employ the same approach when prescribing penalties for criminal offenses committed during a state of war, armed conflict, or state of emergency (Article 417) concerning the offense of disclosing a military secret. It is clear that these inconsistencies regarding essentially the same offenses should be amended in the future (same: Milošević, 2022: 204; Bodrožić & Milošević, 2022: 109). Legal uncertainty is undesirable, although it is noteworthy that, according to data from the Statistical Office of the Republic of Serbia, this criminal offense is statistically infrequent.

Other 'Secrets' under the Criminal Code: Official and Military Secrets

Criminal law protection in Serbia, in addition to state secrets, also includes official secrets, military secrets, and trade secrets (Bodrožić & Milošević, 2022: 100-102). Unlike certain legal frameworks, the Serbian legislator clearly defines the group object that is protected by these types of secrets. For

example, in some legal systems, the disclosure of an official secret is categorised under criminal offenses against the freedoms and rights of individuals, with a broad explanation that personal data can constitute an official secret as well. While this may be accurate, it is not sufficiently precise. It is also important to distinguish between these types of secrets for the purpose of the joinder of offenses, as they represent distinct crimes (Creus, 1998b: 370-371).

Each of the aforementioned types of secrets protects different objects: an official secret protects official duties; a military secret protects the interests of the Serbian Army; and a trade secret safeguards economic interests. Our focus will not be on trade secrets, as they pertain to corporate security, whereas this paper emphasises national security.

Disclosing an official secret, as well as disclosing a military secret, follows the same concept as the previous offenses. These offenses provide definitions of these secrets in both positive and negative terms.

According to Article 369, paragraphs 4 and 5 of the Criminal Code, an official secret is defined as information or documents declared by law, another regulation, or a decision of the competent authority issued pursuant to law, and whose disclosure would or could cause damage to the service. Furthermore, data or documents that aim at a serious violation of fundamental human rights, endangering the constitutional order and security of Serbia, or concealing a criminal offense punishable by imprisonment of five years or more, shall not be deemed an official secret under this definition. This offense has a basic form with prescribed sanction extending from six months to five years of imprisonment (an official who, without authorisation, communicates, conveys, or otherwise makes available information constituting an official secret or obtains such information with the intent to convey it to an unauthorised person), an aggravated form, with prescribed imprisonment extending from one to eight years (if it is committed for gain, involves particularly confidential information, or is intended for publication or use abroad), and a privileged form, that shall be punished by imprisonment up to three years (if the basic form is committed negligently).

Furthermore, Article 415, paragraphs 4 and 5 of the Criminal Code define what constitutes a ”legal” and “illegal” military secret. A military secret is information declared as such by law, other regulations, or a decision of a competent authority made in accordance with the law, whose disclosure would or could cause harm to the Army of Serbia or to the defense and security of the country. Additionally, information or documents aimed at the serious violation of fundamental human rights or compromising the constitutional order and security of Serbia, as well as information and documents intended to conceal a committed criminal offense punishable by imprisonment of five years or more, shall not be deemed a military secret. The offense under Article 415 is divided into basic, aggravated, and privileged forms. Similar to the offense of disclosing a state secret, an additional aggravated form exists if the crime is committed during a state of war, armed conflict, or state of emergency. The basic form is committed when anyone, without authorisation, communicates, hands over, or otherwise makes available information that constitutes a military secret, or when someone obtains such information with the intent to hand it over to an unauthorised person. An imprisonment term extending from six months to five years may be imposed for this form. The aggravated form occurs when the offense is committed for any of the three alternatively prescribed qualifying circumstances: for gain, involving particularly confidential information, or for publishing or using such information abroad. The prescribed sentence for the aggravated form is imprisonment extending from one to eight years. A privileged form exists when the basic offense is committed negligently, and a negligent offender may be punished by imprisonment of up to three years. If the basic or privileged forms are committed during specific times (such as a state of war, armed conflict, or state of emergency), a prison sentence extending from two to ten years may be imposed (Article 417 paragraph 1 of the CC). For the aggravated form, the sentence may range from three to fifteen years (Article 417 paragraph 2 of the CC).

Unlike the offenses of disclosing a state secret, disclosing a military secret, and the offense under Article 98 of the DSL, the perpetrator of criminal offense disclosing an official secret cannot be just anyone; it must be an official person or additionally, according to Article 369, paragraph 6 of the Criminal Code, a "specific" official – one who has disclosed an official secret after their official position has ceased.

As we can see, the prescribed penalties are consistent and become more severe in cases involving the most serious threats to protected interests. It is noteworthy that the penalty ranges are quite broad, giving judges considerable discretion in determining sentences. This means that the "human factor", both from professionals and laypersons, is also important in the application of these provisions and in strengthening the culture of data protection in the area of national security.

(Additional) Secrets and Confidentiality under the Criminal Code

There are two specific crimes involving certain types of secrets that are noteworthy for a brief mention: Unauthorised Disclosure of Secrets (Article 141 of the CC), which protects rights and freedoms of man and citizen, and Violation of Confidentiality of Proceedings (Article 337 of the CC) which protects the judiciary.

The criminal offense under Article 141 of the CC can be committed by a lawyer, physician, or any other person who, without authorization, discloses a secret that came to their knowledge during the performance of their professional duties. This offense may be punishable by a fine or imprisonment of up to one year. Paragraph 2 of the same article provides a special ground for excluding criminal liability: anyone who discloses a secret in the public interest or in the interest of another person, where such interest outweighs the interest in maintaining the confidentiality of the secret, shall not be punished for the offense. Since the rights and freedoms of individuals represent a group protective object, the purpose of this incrimination is to protect the "owner of the secret" from unauthorised disclosure (Creus, 1998b: 364). This type of secret is specific to certain professions, which is why it is referred to as a professional secret. Perpetrators may include individuals who, due to the nature of their work, have the opportunity to learn personal secrets of others and then disclose them. These professions include clerics, pharmacists, midwives, nurses, and trainee lawyers, as they may come into possession of personal secrets of the people they interact with during the performance of their duties (Bodrožić & Milošević, 2022: 99). With regard to this offense, in addition to the Criminal Code, bylaws serve as a legal source for better understanding and clarifying the elements of the crime, especially since unlawfulness is a mandatory element. For example, relevant codes include the Code of Medical Ethics of the Medical Chamber of Serbia (Official Gazette of the Republic of Serbia, 104/2016) and the Code of Professional Ethics of Lawyers (Official Gazette of the Republic of Serbia, 27/2012 and 159/2020 – decision by the Constitutional Court). Prosecution for this offense is initiated by a motion from the injured party, which must be submitted to the competent public prosecutor. The provisions, including lower penalties, special grounds for exclusion of liability, and specific rules for criminal prosecution, suggest a lower level of social danger associated with this crime and a preference for addressing such infringements primarily through less severe mechanisms of law.

The offense of Violation of Confidentiality of Proceedings under Article 337 of the Criminal Code protects the unimpeded functioning of the judiciary. This offense includes a basic form and three aggravated forms. The basic form can be committed by anyone who, without authorisation, discloses information learned in a court, misdemeanour, administrative, or other procedure established by law, where the law stipulates that such information must not be publicised or has been declared secret by a decision of the court or another relevant body. The offender may be punished by a fine or impris-

onment of up to one year. The first aggravated form can be committed in four alternative ways: by anyone who without a court decision discloses the course of a criminal proceeding in which the public has been excluded, reveals a decision made in a criminal proceeding against a minor, discloses the name of the minor involved in the proceeding, or shares information that could reveal the identity of the minor. The prescribed sentence is imprisonment of up to two years. The second aggravated form occurs when the perpetrator, without authorisation, discloses information regarding the identity or personal data of a person protected in criminal proceedings or data concerning a special protection program. The punishment for this is imprisonment extending from six months to five years. The third aggravated form is related to the previous one. If this offense results in serious consequences for the protected person or significantly prevents or hinders the criminal proceedings, the offender shall be punished by imprisonment extending from one to eight years.

In 2009, certain changes were made to this incrimination. The sentences for the aggravated forms were increased, and paragraph 2 of Article 337 was slightly redefined. Before these amendments, it constituted a specific form with the same prescribed penalty as the basic form. Additionally, a new act was incriminated, referring to the disclosure of the course of a criminal proceeding from which the public has been excluded.

This criminal offense applies when information obtained during a procedure is disclosed, despite being declared secret based on relevant laws (such as Data Secrecy Law or Criminal Procedure Code – CPC, Official Gazette RS, 72/2011, 101/2011, 121/2012, 32/2013, 45/2013, 55/2014, 35/2019, 27/2021 - decision by the Constitutional Court and 62/2021 - decision by the Constitutional Court). Given that information from criminal proceedings represents one of the most "sensitive" types of data and encompasses the most important values protected by criminal law, it is important to consider some theoretical and practical implications of classified data in criminal procedure. Especially, in the context of "state secret doctrine" that deals with considering the justification for classifying certain information as secret, with the explanation of protecting a prevailing interest. In other words, it represents the relationship between constitutionally guaranteed rights and security interests. An illustrative example of "overprotection of data" is the frequent declaration of secrets under the pretext of protection against terrorism following the September 11, 2001 terrorist attacks in the United States (Cassman, 2015: 1215-1217). Furthermore, "the state secrets privilege" is a judicial doctrine where the court assesses various interests in determining whether the information should or should not be disclosed (Raguan, 2014: 122). Under this doctrine, invoking a state secret is used to prevent judicial oversight. A well-known case is American Civil Liberties vs. NSA regarding the violation of the Fourth Amendment of the U.S. Constitution, which protects citizens from unreasonable searches and seizures. After the first instance court found a violation of this amendment and determined the surveillance to be unjustified, the appellate court ruled that the plaintiffs had not provided evidence that their communications were being monitored. The problem arose because, in response to their request, the NSA refused to provide this information, citing the state secrets doctrine (Cassman, 2015: 1213-1214). Considering that significant intrusions into citizens' privacy require judicial oversight, a similar "legal situation" occurred in Serbia before the amendments to the Law on the Security Information Agency – LSIA (particularly in Articles 13, 14, 15a-15g). In response to a request by a non-governmental organisation for the number of citizens wiretapped during 2005, the Security Information Agency essentially invoked what we have defined as the state secrets doctrine, stating that the disclosure could seriously harm an interest that outweighs the public's right to know (Application no. 48135/06, ECHR Strasbourg, Youth Initiative for Human Rights v. Serbia, 25/09/2013; Milosavljević, 2023: 362-365). After the amendments, the current legal solution is satisfactory. Nevertheless, this remains an important issue that requires special attention from both the legislator and those who apply these provisions, bearing in mind that there are many "hidden secrets" that do not surface in practice. We identified this issue based on com-

parative experiences documented in relevant sources, as well as from national context, particularly in relation to Article 105 of the DSL, which stipulates the need for reconsideration of existing classification markings (Kovačević & Milošević, 2022: 101-102; Donohue, 2010: 215-216).

FINDINGS/ORGINALITY/VALUE

Conclusion

The offense prescribed under Article 98 of the Data Secrecy Law, which addresses the disclosure of classified data, the criminal offense of Disclosing a State Secret under Article 316 of the Criminal Code, and the offenses under Articles 369 and 415 of the Criminal Code that protect official and military secrets respectively, along with the aggravated forms prescribed under Articles 321 and 417 of the Criminal Code, constitute a significant normative framework for safeguarding secrecy against the most severe breaches. However, these analyses reveal inconsistencies within the domestic legal system. This discrepancy is the most evident in the realm of prescribed sanctions, where different penalty ranges exist for substantially similar criminal offenses. Additionally, there are shortcomings in certain manners of perpetration. Broadly speaking, our legal system delineates two regimes of classified data protection: before and after 2009, when the Data Secrecy Law came into force.

The most significant legal inconsistency concerns the offense of Disclosing a State Secret, given that there are two penalty ranges if this offense is committed during the state of war or emergency: imprisonment extending from three to fifteen years under Article 316, paragraph 3, and imprisonment for a minimum of ten years or life imprisonment under Article 321, paragraph 3. Furthermore, under Article 98, paragraph 4 of the Data Secrecy Law (DSL), which pertains to classified data marked as "top secret" (equivalent to a state secret under the Criminal Code), there is yet another penalty range: imprisonment extending from five to fifteen years for the same qualifying circumstances. This discrepancy should be addressed in future amendments to the Criminal Code, as recognized in relevant legal doctrine. One possible solution could be to delete the aggravated form prescribed under Article 321, paragraph 3, aligning it with the structure of other offenses involving the disclosure of specific secrets (such as military or official secrets). For now, both provisions – Article 316 of the Criminal Code and Article 98 of the DSL – remain in force. Despite certain differences between the definitions of classified data under the Data Secrecy Law and state secrets under the Criminal Code, both of which are important for considering the object of the crime (with the former being predominantly formal, with an indirect reference to the material element through the specification of different levels of secrecy, and the latter employing both formal and material criteria), the primary reason for the parallel existence of substantively similar incriminations can be found in Article 105 of the DSL, as the process of reconsidering existing classification markings has not yet been completed.

Besides the aforementioned offenses, Unauthorised Disclosure of Secrets under Article 141 of the Criminal Code and Violation of Confidentiality of Proceedings under Article 337 of the same law further strengthen the realm of confidentiality. These offenses protect different categories of group objects, such as the rights and freedoms of man and citizen or the judiciary. The offense under Article 141 of the CC falls into the category of minor offenses and, considering the prescribed penalty, allows for the application of lighter criminal sanctions, such as community service or warning measures like a suspended sentence or judicial admonition. It also permits the use of certain legal institutes, such as the Offense of Minor Significance under Article 18 of the CC or Deferring Criminal Prosecution under Article 283 of the Criminal Procedure Code. The second offense differs slightly from the others,

as it pertains to protecting the confidentiality of proceedings, which can be relevant in the context of potential abuse of privileged information, especially in criminal proceedings.

Moreover, we have observed that this area is regulated by a significant number of bylaws, which is exceptional in the field of criminal law as it sometimes challenges the principle of legality. Nevertheless, such regulation is necessary in this context, although it requires greater awareness among all participants – both those applying the law and potential offenders.

The issue of data secrecy is one of the most significant aspects of the national security system, both in its preventive and repressive functions. In light of the identified inconsistencies, this article aimed to propose solutions for future amendments and the application of the law. The importance of the classified data protected under the provisions of the Data Secrecy Law and the Criminal Code highlights the sensitivity of this topic, necessitating further development. While an adequate normative framework is essential, effective law enforcement is urgently required to ensure comprehensive protection. Additionally, enhancing the culture of security in the handling and management of classified data is a crucial element of data secrecy protection. As noted in domestic classic literature, Jovan Dučić remarked that "Silent people pour their trust into those they work with, as many see their own security in the silence of others".

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JURISDICTIONAL CHALLENGES OF CYBERCRIMES AND THE ROLE OF THE INTERNATIONAL CRIMINAL COURT

Naeem AllahRakha[1]
Tashkent State University of Law, Uzbekistan

PURPOSE (INTRODUCTION)

Cybercrime is illegal activity involving computers, the internet, or network devices (Smyth, Curran, & McKelvey, 2019). It covers a wide array of criminal activities conducted using digital technology, and it can be broadly classified into cyber-dependent and cyber-enabled crimes. According to the UK National Cyber Security Strategy, cyber-dependent crimes are those that can only be committed through Information and Communications Technology (ICT) devices, which serve as both the tool and the target of the crime, such as malware development for financial gain and hacking to steal or destroy data. On the other hand, cyber-enabled crimes are traditional offenses that can be amplified in scope by utilizing ICT, including fraud and data theft (Wong, 2018). Similarly, the Royal Canadian Mounted Police (RCMP) categorizes cybercrime into two types: technology-as-target and technology-as-instrument. Technology-as-target involves crimes that necessitate the use of digital devices, such as unauthorized computer access and denial-of-service attacks, while technology-as-instrument involves crimes where the internet and digital technologies facilitate the offense, including online scams and identity theft (Clough, 2015).

The European Union identifies cybercrime as comprising internet-specific crimes like phishing, online fraud, and illegal online content such as child sexual abuse material and incitement to racial hatred (Phillips et al., 2022). In Uzbekistan, Article 3 state that cybercrime is defined under the cybersecurity law as cumulative offenses conducted in cyberspace using software and technical means for the purpose of obtaining, altering, destroying, or breaching information systems and resources. The USA Department of Justice further broadens the scope, defining computer crime as any criminal law violation that requires knowledge of computer technology for perpetration, investigation, or prosecution (Bazelon et al., 2006). In China, article 286 of the Criminal Law state that whoever violates state regulations by deleting, altering, adding, or interfering with computer information systems, causing abnormal operations and grave consequences, shall be sentenced to up to five years of imprisonment or criminal detention; if the consequences are particularly serious, the sentence shall be no less than five years of imprisonment (Calderoni et al., 2022). Anyone who deliberately creates and propagates computer viruses or other programs that sabotage the normal operation of computer systems, causing grave consequences, shall be punished similarly (Ronggong & Lijia, 2020).

1 chaudharynaeem133@gmail.com

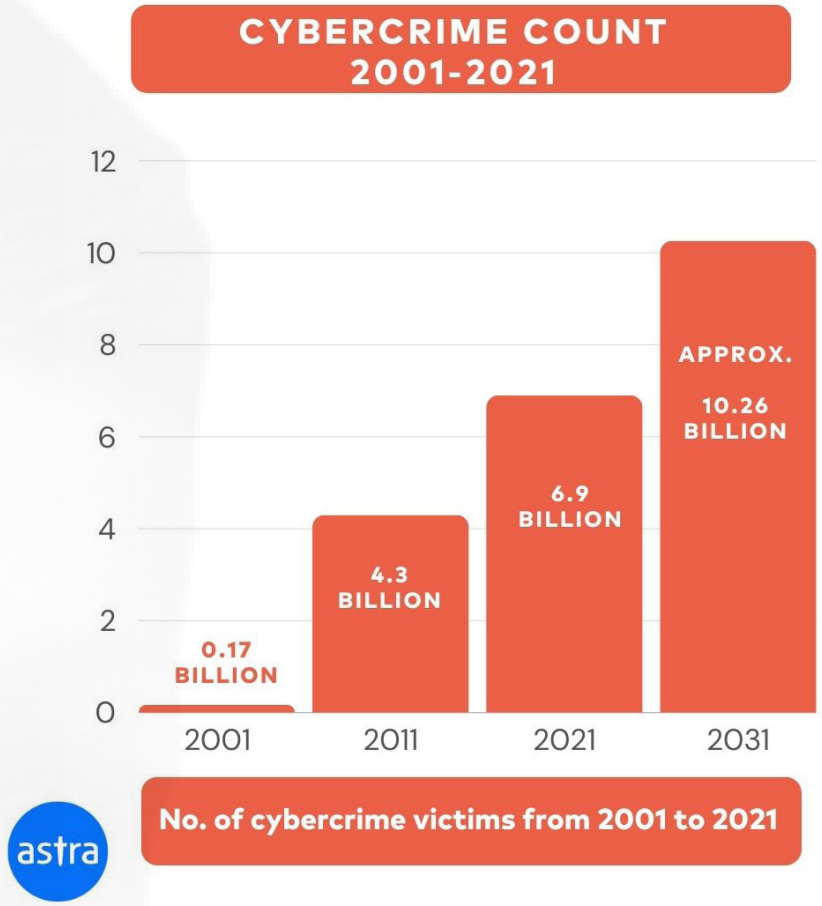


Figure 1.

The figure 1 shows the alarming increase in the number of cybercrime victims globally over a span of 20 years, from 2001 to 2021, with a projected estimate for 2031. In 2001, the number of cybercrime victims stood at approximately 0.17 billion. This number grew significantly to 4.3 billion by 2011, indicating a substantial rise in cybercrime activities during that decade. The trend continued, and by 2021, the number of victims had reached 6.9 billion worldwide. Alarmingly, the chart projects that if the current trajectory persists, the number of cybercrime victims could escalate to an approximate 10.26 billion by 2031. According to the 2022 annual report published by the Internet Crime Complaint Center (IC3), the United States reported the highest number of victims of internet-facilitated criminal activity among countries worldwide. The tally of victims from the United States stood at an alarming 479,181 cases. Following closely behind was the United Kingdom, which documented 284,291 victims of such crimes during the same year. Canada ranked third among the most afflicted nations, with 5,517 cases of citizens falling prey to internet-facilitated criminal offenses as per the IC3 report.

Various actors engage in cybercrime, including individual hackers, organized crime groups, corrupt company employees, and foreign intelligence operatives (Galeotti, 2023). Presently, financially motivated organized criminal networks, often comprising members from diverse countries, are the primary perpetrators of cybercrime. Unlike traditional organized crime groups, these networks do not necessarily have a hierarchical structure; instead, they operate in a decentralized manner, with members remaining relatively anonymous and independent (Di Nicola, 2022). When these criminals plan a cyberattack, they utilize the network to acquire the necessary resources and expertise for the operation. These networks span across borders, with members from numerous countries. Most cyberattacks

are believed to originate from regions such as America, China, Europe, and Russia, while organized criminal networks are emerging in South-East Asia. Cyber criminals often target users from countries with weaker governmental institutions or less stringent rule of law, as well as those where cybercrime contributes significantly to economic growth (Khadam et al., 2023). Furthermore, wrongdoer exploit international law enforcement boundaries, making it challenging to investigate and prosecute their crimes effectively (Mayans-Hermida & Holá, 2023).

Jurisdiction is the legal authority granted to a legal entity to administer justice. It encompasses the authority of a court or official organization to make decisions and judgments (Hovell, 2018). There are several types of jurisdictions, including exclusive jurisdiction, appellate court jurisdiction, original jurisdiction, subject matter jurisdiction, concurrent jurisdiction, personal jurisdiction, criminal jurisdiction, and advisory jurisdiction. In international law, jurisdiction refers to a state's power to affect persons, property, and circumstances within its territory (Kamminga, 2020). This includes the ability to prescribe laws applicable to individuals or conduct (jurisdiction to prescribe) and the ability to subject persons or things to court processes (jurisdiction to adjudicate). State jurisdiction in international law is rooted in the principle of sovereign equality, which grants each state the exclusive right to exercise jurisdiction based on principles such as territoriality, protective principle, nationality/active personality, passive personality, and universality (Roth, 2011).

The International Criminal Court (ICC) addresses the gravest crimes, including genocide, war crimes, crimes against humanity, and aggression, aiming to end impunity and prevent such atrocities (Rome statute, 1998; Palarczyk, 2023). With 31 cases and 46 arrest warrants issued, the ICC has seen 21 detainees and 17 suspects at large, with charges dropped against seven deceased individuals. The ICC is now considering expanding its mandate to include cybercrimes that violate the Rome Statute, recognizing the significant impact of cyber warfare on human lives (Sarkar & Shukla, 2023). Prosecutor Karim Khan emphasizes that the digital front lines can cause damage and suffering akin to what the ICC founders intended to prevent, highlighting this in Foreign Policy magazine (Onn, 2023). Through its efforts, the ICC continues its global mission of holding perpetrators accountable and preventing future crimes.

This research problem explores the ICC's evolving jurisdiction to include cyber activities that may constitute core international crimes. Article 8(2)(b)(ii) of the Rome Statute criminalizes attacks on civilian objects without reference to the means used, indicating that cyber-attacks on civilian infrastructure could lead to criminal liability. Despite the consensus among scholars and experts, including those behind the Tallinn Manual and the 2021 Report on the Application of the Rome Statute of the ICC to cyber warfare, significant challenges remain. The ICC is mandated, as affirmed by the preamble to the Rome Statute, to prosecute only "the most serious crimes of concern to the international community as a whole," and must declare a case inadmissible if it lacks sufficient gravity (Article 17(1)(d)). Furthermore, attributing cyber activities to specific perpetrators is notoriously difficult. Addressing these challenges is crucial for ensuring that the ICC can effectively respond to the emerging threat of cybercrimes, thereby maintaining its role in upholding international justice in the digital age. The study examines the potential role of the ICC in expanding its mandate to include cybercrimes that violate the Rome Statute.

The rapid advancement of technology and the increasing dependency on digital infrastructure have led to a significant rise in cybercrimes globally (Chen et al., 2023). The literature on cybercrimes reveals a multifaceted problem that challenges traditional notions of jurisdiction and international law. This review critically analyzes existing studies to identify gaps, inconsistencies, and areas that require further exploration. Lee et al. (2023) and Iftikhar (2024) have extensively discussed the various forms of cybercrime, including hacking, identity theft, and cyber-terrorism. These works highlight the diverse and evolving nature of cybercrimes, but they also indicate a need for more comprehensive definition to

better understand and combat these crimes (Peters & Jordan, 2020). The transnational nature of cybercrimes poses significant jurisdictional challenges. Curtis and Oxburgh (2022) argue that cybercrimes often involve perpetrators and victims in different countries, complicating law enforcement efforts.

Similarly, Perloff-Giles (2018) emphasizes the difficulty in applying traditional territorial jurisdiction to crimes committed in cyberspace. Existing international frameworks, such as the Budapest Convention on Cybercrime, provide a foundation for cooperation. However, they have limitations of immunity of state official and state cooperation (Liu, 2024). As noted by Clough (2023), not all countries are signatories, leading to gaps in global cooperation. The literature points to the need for more inclusive and binding international agreements. The potential role of the ICC in prosecuting cybercrimes has been explored by several scholars. For instance, Schjolberg and Ghernaouti-Helie (2011) discusses the possibility of the ICC expanding its mandate to include cybercrimes that meet the criteria of the Rome Statute (AllahRakha, 2024). However, this proposition raises questions about the ICC's capacity and jurisdiction, which are yet to be fully addressed in the literature (Sadat, 2024).

Studies by Arnell and Faturoti (2022) provide insights into various national approaches to cybercrime prosecution. It reveals significant disparities in legal frameworks and enforcement capabilities, underscoring the need for harmonization and international standards. Research by Osei Mensah, Mensah, and Opoku (2023); Lancry and Rahim, (2023) focuses on the experiences and challenges faced by cybercrime victims. This highlights the psychological and financial impacts of cybercrimes, pointing to the need for better victim support systems. The dynamic nature of cybercrimes necessitates continuous technological and legal adaptations. Whalen (2022) and AllahRakha (2024) argue for the need to update legal definitions and frameworks regularly to keep pace with technological advancements. This view is supported by Walter (2024), who emphasizes the importance of adaptive and flexible legal mechanisms.

Safitra, Lubis, and Fakhrurroja (2023) discuss various policy and regulatory responses to cybercrime. These works highlight the importance of comprehensive cybersecurity policies that incorporate preventive measures, legal responses, and international cooperation. Evidence collection in cybercrime cases presents unique challenges, as discussed by AllahRakha (2024) and Casino (2022). The volatility and ephemerality of digital evidence require specialized skills and tools, which are not uniformly available across jurisdictions. The intersection of cybercrime enforcement and privacy rights is a critical area of concern. Studies by Power, Heavin, and O'Connor (2021); Dhirani et al. (2023) explore the ethical implications of surveillance and data collection, highlighting the need to balance security and privacy.

Theoretical frameworks for understanding cybercrimes have been developed by Curry (2023); Leukfeldt and Yar, (2016); Palmieri, Shortland, and McGarry, 2021), who apply criminological theories to the digital context. These theoretical perspectives provide valuable insights but also indicate the need for further development to address new types of cybercrimes. The importance of global cooperation and capacity building is emphasized in studies by Peters and Jordan (2020); Homburger (2019). These works advocate for increased international collaboration and resource sharing to combat cybercrimes effectively (Daniel, 2023). Recent legislative innovations, such as the EU's Cybersecurity Act, General Data Protection Regulation (GDPR), and The Network and Information Systems Directive (NIS Directive) have implications for cybercrime enforcement. As discussed by Kuner (2012) and Bygrave (2014), such regulations can enhance cybersecurity, data protection and legal measures but also create new compliance challenges for international cybercrime investigations.

Zaid and Garai, (2024); Wu, Peng, and Lemke, (2023); Park and Park, (2024) identify emerging trends in cybercrime and propose future research directions. They call for interdisciplinary approaches that integrate legal, technological, and social perspectives to develop more effective responses to cybercrimes. The literature reveals a complex and evolving landscape of cybercrimes that challenges tradi-

tional legal frameworks for investigation and jurisdictional enforcement. While significant progress has been made in understanding and addressing cybercrimes, there remain critical gaps and inconsistencies. The potential role of the ICC in prosecuting cybercrimes presents a promising but controversial avenue for future policy development.

The existing literature provides valuable insights into the jurisdictional challenges of cybercrimes and the role of the ICC in addressing them. However, a notable gap in the literature is the lack of comprehensive analysis regarding the feasibility and implications of expanding the ICC's mandate to include cybercrimes. While scholars have discussed the jurisdictional challenges, international legal frameworks, and challenges of victim, evidence collection and adaptation of technological. There is a dearth of empirical studies or case analyses that examine how such an expansion would practically impact the ICC's operations, jurisdictional principles, and relationship with national legal systems. There is limited research on the perspectives of ICC member states and other stakeholders regarding the proposal to include cybercrimes under the Rome Statute. Addressing this gap is important for understanding the practical implications of expanding the ICC's jurisdiction and for informing policy decisions regarding international responses to cybercrimes.

The questions of this research as under

> **Q-1:** Expanding the ICC's jurisdiction to incorporate cybercrimes will enhance its capacity to prosecute international crimes committed through digital means. How this expansion aligns with the Rome Statute's core principles?
>
> **Q-2:** The inclusion of cybercrimes within the ICC's mandate will face significant jurisdictional challenges, particularly in attributing cyber activities to specific perpetrators due to the anonymity and transnational nature of cyberspace. What types of cases will the ICC investigate and prosecute, and on what grounds will these cases be based?
>
> **Q-3:** The feasibility and practical implementation of prosecuting cybercrimes at the ICC will depend on developing robust international legal frameworks and cooperation mechanisms. What international legal mechanisms will the ICC adopt to enforcement of sentence of cybercrimes?

This study focuses on examining the potential expansion of the ICC jurisdiction to include cybercrimes. It delves into the jurisdictional challenges, practical implementation, and the development of robust international legal frameworks to address these crimes. However, the study is delimited by several factors. Primarily, it considers the legal and procedural aspects without a detailed technical analysis of cybercrime detection and attribution methods. The research does not explore the intricacies of domestic cybercrime laws. The study is constrained by its reliance on Rome Statute legal framework. The rapidly evolving nature of cybercrimes and technological advancements means that the findings might become outdated as new threats and methods of cybercrime emerge. The study assumes cooperation and willingness among ICC member states to adapt their legal systems to accommodate the prosecution of cybercrimes, which may not reflect the real-world political and legal complexities.

The potential contributions and implications of this research are manifold, highlighting its academic, practical, and societal relevance. Academically, this study fills a critical gap in the existing literature by providing a comprehensive analysis of the feasibility and implications of expanding the ICC's mandate to include cybercrimes. Practically, it can inform the development of policies and strategies to enhance the ICC's capacity to address cybercrimes, thereby strengthening the global legal response to digital threats. From a societal perspective, the study underscores the growing importance of addressing cybercrimes in an interconnected world. As cybercrimes increasingly impact individuals, organi-

zations, and nations, ensuring that these crimes are met with appropriate legal responses is crucial for maintaining public trust in digital technologies and international justice systems.

METHODOLOGY

This study adopts a qualitative research design, chosen for its dynamic nature, allowing the researcher to engage with respondents in real-time, facilitating in-depth conversations on the subject (Tenny, Brannan, & Brannan, 2022). This approach is particularly well-suited for exploring complex issues such as cybercrime jurisdiction and the role of the International Criminal Court (ICC). The target population comprises a wide range of published research papers related to cybercrimes, jurisdiction, and international law. A sampling strategy was employed, utilizing databases such as Westlaw, Legal Information Institute, Casetext, Oxford Reports on International Law and Oxford Reports on International Human Rights Law, Lexis, Google Scholar, HeinOnline, and ProQuest. Initially, 4835 manuscripts were identified, which were then filtered to include only English papers published since 2015 except fewer that are legal and theoretical framework, resulting in a final set of 1065 references for further evaluation.

The data collection process involved using a specific set of keywords to access relevant research papers, books, and monographs related to cybercrimes and jurisdiction. These keywords included "Cybercrime," "Jurisdiction," "International Criminal Court," "Cross-border crimes," "Territoriality principle," "Cyber jurisdiction," "Cyber law enforcement," "International cooperation," "Sovereignty," "Extradition," "Digital evidence," "Cybersecurity," "Digital rights," "Transnational crime," "International criminal law," "Cybercrime Investigation," and "Cybercrime Prosecution." This approach ensured that the collected data covered a wide range of topics relevant to the study. A manual screening process was then conducted to exclude overly technical papers and irrelevant sources, resulting in a final set of 107 references from reputable publications.

As this study adopts a doctrinal research approach. Doctrinal legal research methodology focuses on analyzing the text of the law rather than its practical application, providing a detailed analysis of legal rules found in primary sources (Bhat, 2020). The validity and reliability of the research methods were ensured through the use of reputable databases and publications, the exclusion of papers with insufficient data, and a manual screening process to filter relevant sources. The data analysis process involved identifying key themes, patterns, and insights from the collected data. This qualitative analysis focused on examining the content of the research papers to uncover recurring topics, arguments, and perspectives. Themes such as the evolving nature of cybercrimes, the challenges of attributing cyber activities to specific perpetrators, and the implications of cyber-attack on international law were identified. Patterns in the data included the increasing prevalence of cybercrimes globally, the use of digital technologies by criminal networks, and the need for international cooperation to combat cybercrimes effectively. Insights from the data analysis highlighted the complexity of jurisdictional issues in cyberspace, the importance of updating legal frameworks to address technological advancements, and the potential role of the ICC in prosecuting cybercrimes.

The findings contribute to a deeper understanding of the challenges posed by cybercrimes and the ways in which international law and institutions can respond to these challenges. This study adhered to strict ethical standards to ensure the integrity of the research process and the protection of individuals and entities involved. All data obtained from legal cases, law enforcement agencies, or other sources were handled with the utmost care and in compliance with relevant data protection regulations. Ethical guidelines from the Committee on Publication Ethics (COPE) and legal boundaries were strictly respected, particularly when dealing with sensitive information or evidence related to ongoing investiga-

tions or legal proceedings. The study ensured that research outcomes were not used in any manner that could potentially harm or exploit participants or the communities affected by cybercrimes.

One limitation of this study is the potential bias in the selection of research papers, as only English papers published since 2015 were included. This may have excluded valuable insights from non-English papers and those published before 2015. Another limitation is the reliance on existing literature, which may not capture the most current developments in cybercrimes and jurisdictional challenges. The exclusion of papers with insufficient data may have also limited the scope of the study, potentially overlooking important perspectives or arguments. The research design assumes that the selected research papers provide a comprehensive and reliable source of information on cybercrimes, jurisdictional challenges, and the role of the ICC. It also assumes that the keywords used in the data collection process accurately captured relevant literature on the subject.

FINDINGS (RESULTS & DISCUSSION)

Jurisdictions

The ICC is established as a permanent institution with the authority to prosecute individuals for the most serious international crimes as specified in its Statute (Rome Statute). It functions in a complementary role to national criminal jurisdictions, meaning it supports but does not replace them. The ICC has international legal personality and the legal capacity necessary to carry out its functions and objectives (Šturma, 2019). It can operate within the territories of State Parties and, through special agreements, in other states. The ICC's relationship with the United Nations will be formalized through an agreement approved by the Assembly of States Parties and signed by the President of the Court on its behalf (Sterio, 2020).

The Preamble of the Rome Statute highlights the unity of all peoples through shared heritage and expresses concern over the potential fragility of this mosaic. It acknowledges the devastating atrocities suffered by millions in the 20th century, which deeply shock humanity's conscience. The serious crimes are recognized as threats to global peace, security, and well-being (Heller, 2017). The Preamble affirms that the most serious crimes should not go unpunished and stresses the importance of national and international measures for effective prosecution. It emphasizes the duty of states to exercise criminal jurisdiction over international crimes and reaffirms the principles of the United Nations Charter, particularly the prohibition against the use of force. The Preamble asserts that the Statute does not authorize state intervention in armed conflicts or internal affairs. It resolves to establish an independent, permanent International Criminal Court, complementary to national jurisdictions, to uphold international justice for present and future generations (Ambos, 2022).

The Court's jurisdiction is confined to the most serious crimes of international concern, specifically: genocide, crimes against humanity, war crimes, and the crime of aggression (Dubey, 2021). The Elements of Crimes guide the Court in interpreting and applying articles 6, 7, 8, and 8 bis of the Rome Statute. These elements are adopted by a two-thirds majority of the Assembly of States Parties. Amendments to the Elements of Crimes can be proposed by any State Party, a majority of the judges, or the Prosecutor, and require a two-thirds majority for adoption. Both the Elements of Crimes and any amendments must align with the Statute. The ICC may exercise jurisdiction if the crime occurred on the territory of a state party, or if the accused is a national of a state party (Galand, 2019).

States not party to the statute may accept the ICC's jurisdiction for a specific crime. The ICC can exercise its jurisdiction if a situation involving such crimes is referred to the Prosecutor by a state party, the UN Security Council under Chapter VII of the UN Charter, or if the Prosecutor initiates an investigation (Akande & Tzanakopoulos, 2018). A State Party can refer a situation to the ICC Prosecutor if it believes that one or more crimes within the ICC's jurisdiction have been committed. The referral asks the Prosecutor to investigate the situation to determine if specific individuals should be charged with these crimes. The referral should include details about the situation and any available supporting documentation. The principle of ne bis in idem, meaning "not twice for the same," is enshrined to prevent double jeopardy (Nuridzhanian, 2024). It states that a person cannot be tried by the ICC for crimes they have already been convicted or acquitted of by the ICC or another court. Similarly, if a person has been tried by another court for conduct that also falls under the jurisdiction of the ICC. They cannot be tried again by the ICC unless the previous proceedings were intended to protect the person from liability or were conducted unfairly (Galand, 2019).

The Court ensures its jurisdiction and may determine the admissibility of a case based on challenges brought by the accused, a State with jurisdiction over the case, or a State required to accept jurisdiction. The Prosecutor may also seek a ruling on jurisdiction or admissibility, with input allowed from those who referred the situation and victims (Sekulow & Ash, 2020). Challenges to admissibility or jurisdiction may only be made once and must occur before or at the trial's start, although exceptions can be granted. Such challenges are first reviewed by the Pre-Trial Chamber and then by the Trial Chamber after charges are confirmed, with appeal to the Appeals Chamber possible (Guilfoyle, 2019). The Prosecutor must suspend an investigation if a State challenges admissibility, but certain investigative steps can be pursued pending the Court's ruling. A challenge does not invalidate prior actions of the Prosecutor or Court, and the Prosecutor can request a review of an inadmissibility decision if new facts arise. If the Prosecutor defers an investigation, they may request information from the relevant State, which must be kept confidential unless the Prosecutor decides to proceed with the investigation (Urs, 2024).

The Rome Statute, in Article 6, defines "genocide" as acts committed with the intent to destroy a national, ethnical, racial, or religious group, in whole or in part. These acts include killing, causing serious harm, inflicting destructive conditions, preventing births, and forcibly transferring children. In the case of The Prosecutor v. Omar Hassan Ahmad Al Bashir, the ICC has charged the Sudanese President with multiple counts of genocide, crimes against humanity, and war crimes allegedly committed in Darfur between 2003 and 2008. The specific charges include murder, rape, targeting civilians, pillaging, and three counts of genocide. Despite arrest warrants issued in 2009 and 2010, Al Bashir remains at large, preventing the ICC from proceeding to trial until he is apprehended and transferred to The Hague. The case is currently in the Pre-Trial stage (Schabas, 2016).

Table 1. *Crimes Related to Genocide*

Category of Crime	**Description of Crimes** (Data source is Article 6 of the Rome Statute)
Genocide	Killing members of the group Causing serious bodily harm to members of the group Causing serious mental harm to members of the group Deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part Imposing measures intended to prevent births within the group Forcibly transferring children of the group to another group

Crimes against humanity cover a range of acts committed as part of widespread or systematic attacks on civilian populations with knowledge of the attack. These acts include murder, extermination, enslavement, deportation, imprisonment, torture, sexual violence, persecution, enforced disappearance, apartheid, and other inhumane acts causing severe suffering or injury (Mimiko, Olaseeni, & Oluwadayisi, 2016). The definition of these crimes includes specific interpretations, such as "extermination" involving the deprivation of food and medicine, "enslavement" as exercising ownership over a person, and "forced pregnancy" intended to affect ethnic composition. "Attack directed against any civilian population" involves multiple such acts under a state or organizational policy. The Statute also clarifies that "gender" refers strictly to male and female within the societal context, without any broader implications (Rodenhäuser, 2018).

Table 2. *Crimes Against Humanity*

Category of Crime	**Description of Crimes** (Data source is Article 7 of the Rome Statute)
Crimes against Humanity	Murder
	Extermination
	Enslavement
	Deportation or forcible transfer of population
	Imprisonment or other severe deprivation of physical liberty in violation of fundamental rules of international law
	Torture
	Rape
	Sexual slavery
	Enforced prostitution
	Forced pregnancy
	Enforced sterilization
	Other forms of sexual violence of comparable gravity
	Persecution against any identifiable group or collectivity on political, racial, national, ethnic, cultural, religious, gender, or other universally recognized impermissible grounds
	Enforced disappearance of persons
	The crime of apartheid
	Other inhumane acts of a similar character intentionally causing great suffering, or serious injury to body or to mental or physical health

The Court's jurisdiction over war crimes, emphasizing those committed as part of a plan or on a large scale. War crimes include severe breaches of the Geneva Conventions (12 August 1949), such as willful killing, torture, unlawful deportation, and taking hostages. It addresses violations in international conflicts, like attacks on civilians, humanitarian missions, and protected buildings. Non-international conflicts are also covered, listing crimes like murder, mutilation, rape, and forced displacement (Ramezani Ghavam Abadi, 2020). The provisions exclude internal disturbances, such as riots, focusing instead on prolonged conflicts involving government forces and organized armed groups (Article 8-2-d). The regulations do not hinder a government's duty to maintain law and order or protect the state's unity and territorial integrity. It ensures that while addressing war crimes, the sovereignty and stability of states are respected (Tsilonis, 2024).

Table 3. *Delineate the War Crimes*

Category of Crime	**Description of Crimes** (Data source is Article 8 of the Rome Statute)
War Crimes	Wilful killing Torture or inhuman treatment, including biological experiments Wilfully causing great suffering, or serious injury to body or health Extensive destruction and appropriation of property, not justified by military necessity and carried out unlawfully and wantonly Compelling a prisoner of war or other protected person to serve in the forces of a hostile Power Wilfully depriving a prisoner of war or other protected person of the rights of fair and regular trial Unlawful deportation or transfer or unlawful confinement Taking of hostages Intentionally directing attacks against the civilian population Intentionally directing attacks against civilian objects Intentionally directing attacks against personnel, installations, material, units or vehicles involved in a humanitarian assistance or peacekeeping mission Intentionally launching an attack knowing it will cause incidental loss of life or injury to civilians or damage to civilian objects Attacking or bombarding towns, villages, dwellings or buildings which are undefended and not military objectives Killing or wounding a combatant who has surrendered Making improper use of a flag of truce, flag or military insignia and uniform of the enemy or United Nations distinctive emblems Transferring parts of the Occupying Power's own civilian population into the territory it occupies Intentionally directing attacks against buildings dedicated to religion, education, art, science or charitable purposes, historic monuments, hospitals Subjecting persons in power of an adverse party to physical mutilation or medical or scientific experiments not justified by their medical needs Killing or wounding treacherously individuals belonging to the hostile nation or army Declaring that no quarter will be given Destroying or seizing the enemy's property not justified by military necessity Compelling nationals of the hostile party to participate in operations of war against their own country Pillaging a town or place, even when taken by assault Employing poison or poisoned weapons Employing asphyxiating, poisonous or other gases, and all analogous liquids, materials or devices Employing bullets which expand or flatten easily in the human body Employing weapons, projectiles and material and methods of warfare which cause superfluous injury or unnecessary suffering Committing outrages upon personal dignity, including humiliating and degrading treatment Committing rape, sexual slavery, enforced prostitution, forced pregnancy, enforced sterilization, or any other form of sexual violence also constituting a grave breach of the Geneva Conventions Utilizing the presence of a civilian or other protected person to render certain points, areas or military forces immune from military operations Intentionally directing attacks against buildings, material, medical units and transport, and personnel using the distinctive emblems of the Geneva Conventions Intentionally using starvation of civilians as a method of warfare by depriving them of objects indispensable to their survival Conscripting or enlisting children under the age of fifteen years into the national armed forces or using them to participate actively in hostilities Employing weapons which use microbial or other biological agents, or toxins Employing weapons that cause injury by fragments which escape detection by X-rays Employing laser weapons specifically designed to cause permanent blindness

A crime of aggression involves the planning, preparation, initiation, or execution of an act of aggression by a person in a position to control or direct a State's political or military actions. An act of aggression is defined as the use of armed force by a State against the sovereignty, territorial integrity,

or political independence of another State, or in a manner inconsistent with the UN Charter. Examples include invasion or attack, bombardment, blockade, attacking another State's armed forces, using armed forces in another State without proper agreement, allowing one's territory to be used for aggression, and sending armed groups to carry out aggressive acts (Galand, 2019).

Table 4. *Describes the Crime of Aggression*

Category of Crime	**Description of Crimes** (Data source is Article 8 *bis* of the Rome Statute)
Crime of Aggression	The invasion or attack by the armed forces of a State of the territory of another State
	Military occupation resulting from such invasion or attack
	Annexation by the use of force of the territory of another State or part thereof
	Bombardment by the armed forces of a State against the territory of another State
	The blockade of the ports or coasts of a State by the armed forces of another State
	An attack by the armed forces of a State on the land, sea or air forces, or marine and air fleets of another State
	The use of armed forces of one State within the territory of another State in contravention of the conditions provided in the agreement
	The action of a State in allowing its territory to be used by another State for perpetrating an act of aggression against a third State
	The sending by or on behalf of a State of armed bands, groups, irregulars or mercenaries, to carry out acts of armed force against another State

A case may be deemed inadmissible if it is already being investigated or prosecuted by a state with jurisdiction, unless that state is unwilling or unable to genuinely carry out the proceedings. Similarly, if a state with jurisdiction has decided not to prosecute, the case may be considered inadmissible unless this decision stems from the state's unwillingness or inability to genuinely prosecute. If the person in question has already been tried for the same conduct and a trial by the Court is not permitted, the case may be deemed inadmissible. Finally, a case may be considered not of sufficient gravity to warrant further action by the Court (Krzan, 2021). The determination of unwillingness or inability in a specific case is based on principles of due process and may involve factors such as proceedings being undertaken to shield the person from criminal responsibility, unjustified delays, or lack of impartiality in the proceedings (Birnbaum, 2021). If a state's judicial system has substantially collapsed or is unavailable, rendering the state unable to obtain the accused or necessary evidence, the case may also be deemed inadmissible.

When the ICC receives a referral indicating a reasonable basis for an investigation, or when the Prosecutor decides to initiate an investigation, the Prosecutor must notify all relevant states. These states can then inform the Court if they are already investigating or have investigated individuals for crimes that fall under the ICC's jurisdiction (Bådagård & Klamberg, 2017). The Prosecutor may defer to a state's investigation unless the Pre-Trial Chamber authorizes otherwise. This deferral can be reviewed if there are significant changes or if the state is unwilling or unable to genuinely conduct the investigation. Both the state and the Prosecutor can appeal decisions regarding deferral. The Prosecutor can request updates on the state's investigations and may seek authorization for investigative steps to preserve evidence. States can challenge rulings and the admissibility of a case based on new facts or circumstances (Danilenko, 2000).

The ICC is empowered to exercise jurisdiction over the crime of aggression, subject to specific conditions. For such jurisdiction to apply, at least 30 States Parties must ratify or accept the relevant amendments, and the Court must decide to proceed with jurisdiction after January 1, 2017, by a majority vote. A State Party can exclude the Court's jurisdiction over aggression by declaring so, but it can also

withdraw this declaration within three years. If the Prosecutor wishes to investigate a crime of aggression, they must first confirm whether the Security Council has determined an act of aggression by the State in question (McDougall, 2021). If the Security Council fails to make such a determination within six months, the Prosecutor may proceed with the investigation, provided the Pre-Trial Division authorizes it and the Security Council does not intervene. Any determination of aggression by an external body does not impact the Court's own findings. It's important to note that this article does not affect the Court's jurisdiction over other crimes (Reisinger Coracini & Wrange, 2016).

INVESTIGATION AND PROSECUTION

The Prosecutor of the ICC has the authority to start investigations based on information about crimes falling under the Court's jurisdiction. The Prosecutor evaluates the information's seriousness and may request more information from various sources (Pereira, 2020). If the Prosecutor finds a reasonable basis to proceed, a request for investigation authorization is submitted to the Pre-Trial Chamber, allowing victims to provide input. The Chamber, after review, can authorize the investigation, with subsequent decisions on jurisdiction and admissibility left to the Court. Refusal to authorize does not prevent future requests based on new evidence. If the Prosecutor determines the information insufficient, they can inform the providers but may reconsider with new facts. Additionally, investigations or prosecutions can be delayed if the UN Security Council requests so (Kotecha, 2020).

The Prosecutor must conduct investigations thoroughly to uncover all relevant facts and evidence, considering both incriminating and exonerating circumstances equally. They are tasked with ensuring effective investigations and prosecutions while respecting the interests and circumstances of victims and witnesses, including their age, gender, and health. The Prosecutor must also respect the rights of individuals as outlined in the Statute (Article 55). They have the authority to conduct investigations on a State's territory either through specified procedures or with authorization from the Pre-Trial Chamber. The Prosecutor can collect and examine evidence, question individuals involved, seek cooperation from States and organizations, enter into agreements to facilitate cooperation, maintain confidentiality of certain information, and take necessary measures to protect information, individuals, and evidence (Chigowe, 2022).

During an investigation under the Rome Statute, individuals have several rights. They cannot be forced to incriminate themselves or confess guilt, and they must not face coercion, torture, or other cruel treatment. If questioned in a language they do not fully understand, they have the right to a competent interpreter at no cost. They also cannot be arbitrarily arrested or detained, and their liberty cannot be deprived except under lawful grounds and procedures. If there are grounds to believe a person has committed a crime within the Court's jurisdiction and they are about to be questioned, they must be informed of these grounds and their rights. These rights include being informed of the suspicion of a crime, the right to remain silent, the right to legal assistance, and the right to have counsel present during questioning unless voluntarily waived (Appel, 2018).

The Pre-Trial Chamber's role is to safeguard the integrity and efficiency of proceedings when the Prosecutor identifies a unique opportunity to gather crucial evidence or testimony that may become unavailable for trial later on. Upon being informed by the Prosecutor, the Chamber can take various measures to protect the rights of the defense, including recommending procedures, appointing experts, or even assigning counsel for the defense (Dieckmann & O'Leary, 2017). If the Prosecutor fails to request such measures but the Chamber deems them essential for the defense, it can consult with

the Prosecutor and, if necessary, take action on its own initiative. Any evidence collected or preserved under these measures will be evaluated at trial (Funk, 2015).

The Prosecutor identifies a unique investigative opportunity that may not be available later for a trial. Upon the Prosecutor's notification, the Pre-Trial Chamber can take various measures to ensure the efficiency and integrity of proceedings, including protecting the rights of the defense. These measures may involve making recommendations, appointing experts, recording proceedings, and allowing counsel for the defense to participate (Clooney & Webb, 2021). If the Chamber believes measures are necessary to preserve evidence essential for the defense and the Prosecutor has not sought them, it can consult with the Prosecutor and, if justified, take measures independently. Any evidence collected or preserved is subject to admissibility rules at trial, with the Trial Chamber determining its weight (Donat-Cattin & Greer, 2021).

The Pre-Trial Chamber can issue a warrant of arrest if, upon the Prosecutor's application, it finds reasonable grounds to believe that a person has committed a crime within the Court's jurisdiction and that their arrest is necessary for trial, to prevent obstruction of justice, or to stop the commission of further related crimes. The application must include the person's name, the alleged crimes, a concise statement of facts, evidence supporting the allegations, and reasons for the arrest necessity (Gavrilă, 2023). Alternatively, the Prosecutor can request a summons for the person to appear if sufficient to ensure their presence. The custodial State, upon receiving a request for arrest and surrender, must promptly arrest the person and ensure their rights are respected, with the person having the right to apply for interim release pending surrender. The Pre-Trial Chamber can make recommendations on interim release requests, and once ordered to surrender, the person must be delivered to the Court without delay (Hall & Ryngaert, 2015).

The procedure for confirming charges before a trial, a hearing held by the Pre-Trial Chamber, attended by the Prosecutor, the accused, and their counsel. The Chamber may hold a hearing in the absence of the accused if waived right to be present or fled or cannot found, ensuring representation by counsel if necessary. Prior to the hearing, the accused must receive a copy of the charges and be informed of the evidence (Schabas, 2020). The Prosecutor can continue investigating and may amend or withdraw charges before the hearing, notifying the accused accordingly. During the hearing, the Prosecutor must present sufficient evidence for each charge, which the accused can challenge or object to. Based on the hearing, the Pre-Trial Chamber decides whether there is enough evidence to confirm the charges for trial or not, potentially adjourning for further evidence or investigation. If charges are not confirmed, the Prosecutor can request confirmation with additional evidence. After confirmation, the case moves to a Trial Chamber for further proceedings (McDermott, 2016).

The trial process mandates that the accused must be present in court. If the accused disrupts the trial, the Trial Chamber can remove them, ensuring they can still observe and communicate with their counsel via technology. This removal is a last resort, used only when other options fail and for the shortest time necessary. The presumption of innocence is emphasized, requiring the Prosecutor to prove guilt beyond a reasonable doubt (Gaskins, 2020). The rights of the accused include a public and fair hearing, prompt and detailed information on charges, adequate time for defense preparation, the right to be present and choose legal assistance, examination of witnesses, and access to interpreters, and protection against self-incrimination. The Prosecutor must disclose any evidence that may prove the accused's innocence or mitigate guilt. The Court ensures these provisions are upheld to maintain fairness and justice (Karnavas, 2018).

The Court prioritizes the protection of victims and witnesses, ensuring their safety, well-being, dignity, and privacy. Measures are taken considering factors such as age, gender, health, and the nature of the

crime, especially in cases involving sexual or gender violence or violence against children. The protections must not compromise the rights of the accused or a fair trial (Yang, 2023). The Court may hold private sessions or use special means to protect victims and witnesses, particularly in cases of sexual violence or involving children. Victims can present their views through legal representatives, and the Victims and Witnesses Unit provides advice on protective measures. The Prosecutor may withhold evidence that could endanger a witness, offering a summary instead, ensuring fairness to the accused (Jacovides, 2023). States can request measures for the protection of their officials and sensitive information.

The rules of evidence stipulate that witnesses must commit to truthfulness before testifying. Testimony is usually given in person, though video, audio, or written testimonies may be allowed under certain conditions, provided they do not infringe on the rights of the accused. Parties can submit relevant evidence, and the Court can request any evidence deemed necessary for truth determination (Richmond, 2021). The Court evaluates evidence based on its relevance, probative value, and potential prejudice to a fair trial, respecting confidentiality privileges. It takes judicial notice of widely known facts without requiring proof. Evidence obtained through rights violations is inadmissible if it undermines its reliability or the integrity of proceedings. The Court does not adjudicate the application of national law when assessing the relevance or admissibility of evidence collected by a State (Fallah, 2020).

The decision-making process of the Trial Chamber requires the presence of all judges throughout the trial, with the possibility of alternate judges if needed. Decisions are based solely on evidence and proceedings presented during the trial, adhering strictly to the charges. Judges strive for unanimity, but decisions may be made by majority if necessary, with deliberations kept confidential. The decision must be written, fully reasoned, and delivered in open court, including majority and minority views if there is no unanimity (Guilfoyle, 2019). Upon conviction, the Trial Chamber determines the sentence, considering trial evidence and relevant submissions. It may hold additional hearings for further evidence or submissions regarding sentencing if requested by the Prosecutor or the accused. Any additional representations under article 75 are also heard. The sentence is publicly pronounced, preferably in the accused's presence (Manley, Tehrani, & Rasiah, 2023).

The Prosecutor can appeal based on procedural errors, factual errors, or legal errors. Similarly, the convicted person, or the Prosecutor on their behalf, can appeal on these grounds, as well as any factor affecting the fairness or reliability of the decision (Hodgson, 2023). Sentences may be appealed if they are disproportionate to the crime. During the appeal process, a convicted person typically remains in custody unless the Trial Chamber orders otherwise, but must be released if their custody time exceeds the imposed sentence, unless the Prosecutor is also appealing (Courtney & Kaoutzanis, 2015). In cases of acquittal, the accused is released immediately, with possible exceptions for exceptional circumstances such as flight risk or the seriousness of the offense. Execution of decisions or sentences is suspended during the appeal period (Manley, 2016).

Table 5.. *Annotate the ICC Cases*

C. No.	Accused	Warrant/ summons (Initial Order)	Category of Crimes	State of defendant	State of Proceedings	Situation Name
1	Alfred Yekatom and Patrice-Edouard Ngaïssona	Warrant of arrest 2018	Crimes against humanity War crimes	In ICC custody	Trial	Central African Republic II

2	William Samoei Ruto and Joshua Arap Sang	Summons to appear 2012	Crimes against Humanity	Case closed 2016	Closed Terminate charges	Kenya
3	Mahamat Said Abdel Kani	Warrant of arrest 2019	Crimes against humanity War Crimes	In ICC custody	Trial	Central African Republic II
4	Joseph Kony	Warrant of arrest 2005	Crime Against humanity War crimes	At large	Pre-trial Pending the accused's arrest	Uganda
5	Dominic Ongwen	Warrant of arrest	Crime Against humanity War crimes	In ICC custody	Guilty sentenced	Uganda
6	Bosco Ntaganda	Warrant of arrest	Crimes against humanity War Crimes	In ICC custody	Guilty sentenced	Democratic Republic of the Congo
7	Mathieu Ngudjolo Chui	Warrant of arrest	Crimes against humanity War Crimes	Closed	Acquitted 2012	Democratic Republic of the Congo
8	Francis Kirimi Muthaura and Mohammed Hussein Ali	Summons to appear	Crimes against humanity	Closed	Charges withdraw due to insufficient evidence 2011	Kenya
9	Sylvestre Mudacumura	Warrant of arrest	War crimes	At large	Pre-trial Pending the accused's arrest	Democratic Republic of the Congo
10	Callixte Mbarushimana	Warrant of arrest	Crimes against humanity War Crimes	Case closed and released from ICC custody	Closed Declined to conform the charges	Democratic Republic of the Congo
11	Bemba, Mangenda and Kilolo	Warrant of arrest	Offence against the administration of justice	Case closed convicted	Convicted 2018	Central African Republic
12	Thomas Lubanga	Warrant of arrest	War crimes	Convicted	Sentence 2012	Democratic Republic of the Congo
13	Henry Kiprono Kosgey	Summons to appear	Crimes against humanity	Case closed 2012	Decline to confirm the charges	Kenya
14	Uhuru Muigai Kenyatta	Summons to appear	Crimes against humanity	Case closed	Charges withdrawn due to insufficient evidence	Kenya
15	Germain Katanga	Warrant of arrest	Crimes against humanity War crimes	Case closed By Convict	Sentence 2007	Democratic Republic of the Congo
16	Saleh Mohammed Jerbo Jamus	Summons to appear	War crimes	Case closed his passing 2013	Trial	Darfur, Sudan
17	Abdallah Banda	Summons to appear	War crimes	At large	Trial Pending the accused's arrest	Darfur, Sudan

18	Abdel Raheem Muhammad Hussein	Warrant of arrest	Crimes against humanity War crimes	At large	Pre-trial Pending the accused's arrest	Darfur, Sudan
19	Ahmad Harun	Warrant of arrest 2007	Crimes against humanity War crimes	At large	Pre-trial Pending the accused's arrest	Darfur, Sudan
20	Paul Gicheru and Philip Kipkoech Bett	Warrant of arrest 2015 Paul surrended 2020	Offence against the administration of justice	Case closed	Closed Terminating proceeding against Paul Gicheru his passing	Kenya
21	Simone Gbagbo	Warrant of arrest 2012	Crimes against humanity	Case closed	Closed Charge vacated	Côte d'Ivoire
22	Gbagbo and Blé Goudé	Warrant of arrest 2015	Crimes against humanity	Case closed	Closed Acquitted	Côte d'Ivoire
23	Saif Al-Islam Gaddafi	Warrant of arrest 2011	Crimes against humanity	At large	Pre-trial Pending the accused's arrest	Libya
24	Muammar Gaddafi and Abdullah Al-Senussi	Warrant of arrest 2011	Crimes against humanity	At large	Terminate due to death of Muammar Gaddafi Charge declared inadmissible against Abdullah Al-Senussi	Libya
25	Philip Kipkoech Bett	Warrant of arrest 2015	Offence against the administration of justice	At large	Pre-trial Pending the suspect's arrest	Kenya
26	Walter Osap Barasa	Warrant of arrest 2013	Offence against the administration of justice	At large	Pre-trial Pending the suspect's arrest	Kenya
27	Ali Muhammad Ali Abd-Al-Rahman	Warrant of arrest 2020	Crimes against humanity War crimes	In ICC custody	Trial	Darfur, Sudan
28	Al-Werfalli	Warrant of arrest 2017	War crimes	Case closed	Closed Due to accused death	Libya
29	Al-Tuhamy Mohamed Khaled	Warrant of arrest 2017	Crimes against humanity War crimes	Case closed	Closed Due to accused death	Libya
30	Ahmad Al Faqi Al Mahdi	Warrant of arrest	War crimes	Case closed convicted	Sentence Accused makes an admission of guilt at trial opening	Mali
31	Omar Hassan Ahmad Al Bashir	Warrant of arrest 2009	Crimes against humanity Genocide War crimes	At large	Pre-trial Pending the suspect's arrest	Darfur, Sudan

32	Al Hassan Ag Abdoul Aziz Ag Mohamed Ag Mahmoud	Warrant of arrest 2018	Crimes against humanity War crimes	In ICC custody	Trial	Mali
33	Abu Garda Bahr Idri	Summons to appear	War crimes	Case closed	Pre-trial Charges not confirm	Darfur, Sudan

INTERNATIONAL COOPERATION AND ENFORCEMENT

The Court has the authority to request cooperation from States Parties, transmitting requests via diplomatic or designated channels. Requests may also be sent through Interpol or regional organizations when suitable. Requests and supporting documents must be translated into the official language of the requested State or a working language of the Court. The requested State must keep requests confidential unless disclosure is necessary for execution (Hillebrecht & Straus, 2017). The Court can take measures to protect the safety and well-being of victims, witnesses, and their families. Non-party States can be invited to assist on an ad hoc basis, and failure to cooperate by any State may be reported to the Assembly of States Parties or the Security Council (Cormier, 2020). The Court may request information and assistance from intergovernmental organizations. If a State Party fails to comply with cooperation requests, the Court may refer the matter to the Assembly of States Parties or the Security Council.

In cases of urgency, the ICC can request the provisional arrest of a person before receiving the formal request for surrender and supporting documents. The request must include the person's description and probable location, a brief description of the alleged crimes with dates and locations if possible, and confirmation of an arrest warrant or conviction judgment against the person. If the requested state does not receive the surrender request and documents within specified time limits, the person can be released, but they may still consent to surrender earlier if allowed by the requested state's law. If released, the person can still be arrested and surrendered later if the request and documents are provided afterward (Klamberg, 2017).

The Court may request the arrest and surrender of individuals, which States Parties must comply with under their national laws. If a person challenges surrender based on the principle of ne bis in idem, the State must consult the Court to verify admissibility before proceeding. States must also authorize the transit of surrendered individuals through their territories, with specific conditions for air transport (Melander, Alfredsson, & Holmström, 2021). In cases of competing requests for extradition, priority is given to the Court's request if the case is deemed admissible. States must consider factors such as request dates, the interests of the requesting State, and the gravity of the conduct when deciding between surrendering to the Court or extraditing to another State. If the Court finds a case inadmissible, the requested State must inform the Court if subsequent extradition is refused (du Plessis, 2017).

States are obligated to provide various forms of assistance, such as identifying persons or locations, taking evidence, questioning individuals, serving documents, and protecting victims and witnesses. The ICC can also assure witnesses or experts that they won't be prosecuted for past actions (Kaluzhna & Shunevych, 2022). If a requested form of assistance is prohibited by a State's laws, consultations should be held to find alternative solutions. Requests for assistance must be executed according to the requested State's laws and procedures, and the ICC may directly execute requests in certain circumstances (Fraser & McGonigle Leyh, 2020). Additionally, maintaining confidentiality is important, except when it is necessary for the investigation and proceedings.

The enforcement of sentences of imprisonment by the ICC involves a process where a State, chosen from a list of willing States, is designated to carry out the sentence. The designated State must promptly confirm its acceptance of this designation (Vojta, 2018). The State of enforcement must notify the Court of any circumstances that could affect the terms of imprisonment, with at least 45 days' notice (Schabas, 2020). If the Court does not agree with these circumstances, it will proceed according to its rules. When choosing a State for enforcement, the Court considers principles of equitable distribution of responsibility, international standards for prisoner treatment, and the views of the sentenced person, their nationality, and other relevant factors. If no State is designated, the sentence is served in a facility provided by the host State, with costs covered by the Court (Aston, 2016).

The transfer of a sentenced person to another state or their application for transfer, with the sentence of imprisonment being binding and unmodifiable by states parties (Van der Wilt, 2016). The Court has sole authority over appeals and revisions. Enforcement of imprisonment must comply with international standards, and conditions must be consistent with those for similar offenders in the state of enforcement. Supervision of enforcement lies with the Court, ensuring compliance with international standards (Abu-Hagras, 2017). After completion of the sentence, a person may be transferred to another state, with costs borne by the Court if no state does so. The state of enforcement can extradite or surrender the person upon completion. States must enforce fines and forfeitures ordered by the Court, recovering the value if unable to comply, and transferring the proceeds to the Court (Birkett, 2019).

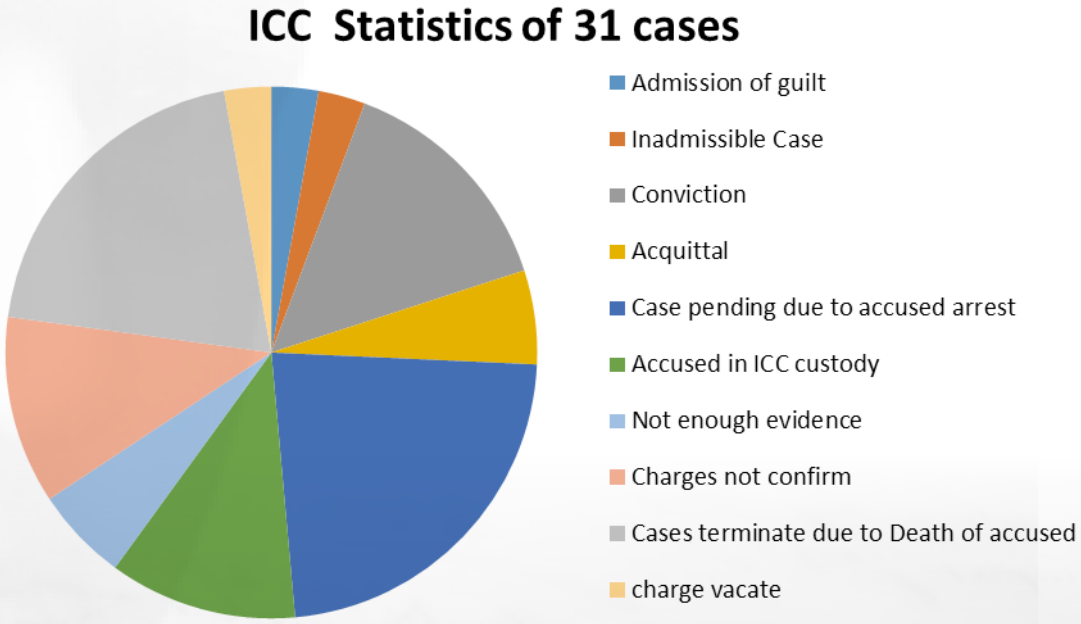


Figure 2. *Graphical Indication of ICC Cases – Current Situation*

The pie chart above visualizes the status of cases handled by the International Criminal Court (ICC). Out of 31 total cases, convictions account for 16.1%, while acquittals represent 6.5%. Cases pending due to the accused's arrest form the largest category at 25.8%, highlighting ongoing challenges in apprehending suspects. Cases terminated due to the death of the accused make up 22.6%, reflecting the impact of such occurrences on judicial proceedings. Additionally, charges not confirmed (12.9%), cases with insufficient evidence (6.5%), and those where charges were vacated or deemed inadmissible (each 3.2%) underline the complexities of legal processes at the ICC. A small percentage (3.2%) involves an admission of guilt, illustrating the rarity of such outcomes. This distribution underscores

the multifaceted nature of international justice and the varying resolutions of cases under the Rome Statute, which established the ICC.

ORIGINALITY/VALUE (CONCLUSION)

This research provides a novel and comprehensive analysis of the jurisdictional challenges faced by the ICC in prosecuting cybercrimes, contributing to the understanding of the Court's role in addressing these offenses in the digital age. The ICC is established as a permanent institution with the authority to prosecute individuals for the most egregious international crimes, as outlined in the Rome Statute. It serves as a complementary entity to national criminal jurisdictions. The ICC is authorized to operate on the territories of State Parties and, by special arrangement, on the territories of non-State Parties. Elements of Crimes mentioned in the Tables 1, 2, 3, and 4 of the Statute, and any amendments to these elements can be proposed by State Parties, the judges, or the Prosecutor and require a two-thirds majority vote by the Assembly of States Parties for adoption. A State joining the Statute accepts the Court's jurisdiction over genocide and other serious crimes.

A State Party can refer cases to the Prosecutor if it suspects that crimes within the Court's jurisdiction have been committed, requesting an investigation to determine whether specific individuals should be charged. The Prosecutor is tasked with assessing the seriousness of the information received and may seek additional information from various reliable sources, including States, the United Nations, and other organizations. Should the Prosecutor find a reasonable basis for an investigation, they must seek authorization from the Pre-Trial Chamber, presenting any collected evidence. Victims also have the right to present their views to the Pre-Trial Chamber, following the established Rules of Procedure and Evidence.

The Court must deem a case inadmissible if it is already being investigated or prosecuted by a State with jurisdiction unless that State is unwilling or unable to conduct genuine proceedings. Similarly, if a State with jurisdiction has investigated but decided not to prosecute, the Court cannot take over unless this decision stemmed from the State's unwillingness or inability to prosecute genuinely. A case is also inadmissible if the person has already been tried for the same conduct or if the case lacks sufficient gravity. Challenges to admissibility or jurisdiction can be made by an accused person, a State with jurisdiction, or a State required accepting jurisdiction under the Statute.

The principle of ne bis in idem ensures that no person is tried twice for the same conduct. Specifically, a person cannot be tried by the ICC for conduct that led to a conviction or acquittal by the Court, nor can they be tried by another court for the same crime if already tried by the ICC. Furthermore, if a person has been tried by another court for conduct proscribed under the Statute, they cannot be tried again by the ICC unless the previous trial was intended to shield the individual from responsibility or was not conducted impartially, failing to adhere to international due process standards.

The ICC Prosecutor is mandated to initiate an investigation if there is sufficient information suggesting a crime within the Court's jurisdiction has been committed, unless there is no reasonable basis to proceed. The decision to investigate considers the crime's gravity, the interests of victims, and the interests of justice. If the Prosecutor determines an investigation is not warranted solely based on these interests, they must inform the Pre-Trial Chamber. Upon concluding an investigation, if the Prosecutor finds insufficient legal or factual grounds to prosecute, or if prosecution is deemed not in the interests of justice considering factors like the perpetrator's age or role, the Pre-Trial Chamber and relevant referring entities must be notified. The Pre-Trial Chamber can review decisions not to

proceed, either upon request or on its initiative, particularly if decisions are based on the interests of justice. The Prosecutor can also reconsider decisions based on new facts or information.

From 2002 to 2024, the ICC has handled 31 cases, as illustrated in Table 5. This highlights the relatively limited number of cases brought before the ICC over more than two decades. In contrast, data from Figure 1 reveals that in 2021 alone, there were 6.9 billion crimes committed globally. This staggering number of crimes suggests that the ICC's capacity to investigate and prosecute is significantly constrained, particularly in the face of the sheer volume of global criminal activity. Given this data, it becomes evident that the ICC, with its current resources and mandate, is not equipped to handle the investigation and prosecution of widespread cybercrimes, which often involve complex, transnational elements and require substantial investigative resources. The vast discrepancy between the number of global crimes and the ICC's caseload underscores the limitations faced by the Court in addressing the full scope of international criminal activity.

The principle of complementarity prioritizes states over the ICC in prosecuting cases within their jurisdiction, as outlined in Articles 17 and 53 of the Rome Statute. This principle renders cases inadmissible before the ICC if a state with jurisdiction is already investigating them. The ICC's capacity to handle cybercrime cases is limited, as evidenced by the fact that 25.8% of cases are pending due to the accused's arrest. The ICC relies heavily on state cooperation for the participation of the accused. Consequently, states, when supportive of the ICC, are better positioned to try cybercrime cases themselves, possessing greater resources for investigation and prosecution. This cooperation highlights the importance of state involvement in effectively addressing cybercrime, leveraging their resources and judicial capabilities.

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III

NATURAL AND APPLIED SCIENCES IN FORENSICS, CYBERCRIME AND SECURITY

CBRN THREATS AND SECURITY: THE ROLE AND IMPORTANCE OF FUNDAMENTAL SCIENCES, POLICE AND SECURITY FORCES

Aybüke A. İsbir Turan, PhD[1]
Turkish National Police Academy, Institute of Forensic Sciences
Department of Science, Ankara, Türkiye

INTRODUCTION

The hazards presented to organisms by chemical, biological, radiation, and nuclear (CBRN) agents have been present throughout human history and persist today. It is impossible to entirely eradicate the risks and threats posed by CBRN agents, encountered in various forms that may or may not be documented in literature. Given the growing diversity of CBRN-related threats, maintaining continuous attention and awareness is crucial to safeguarding safety and security within society. Awareness should encompass identifying both the existing and evolving threats, along with acknowledging the necessity for flexible, efficient, science- and technology-driven strategies to prevent, detect, and respond to CBRN threats. It is crucial to stay abreast of evolving challenges and threats to CBRN security through sustainable security solutions, scientific and technological innovations. Science, technology, and engineering play a vital role in addressing these issues. The advancement of science and technology is key in detecting and mitigating CBRN threats.

The CBRN threat landscape involves adversaries, terrorists, and criminal groups aiming to acquire chemical or biological agents or exploit the beneficial applications of nuclear and other radioactive materials for malevolent purposes. In the current era, security strategies highlight the frequent utilization of technological advancements and scientific support. Nations are noted to leverage biological innovations when traditional methods prove inadequate in safeguarding their borders. Today, defense strategies reliant on human resources are being supplanted by artificial intelligence, with weaponry benefiting from technological and scientific progress. In this era of significant scientific advancements, efforts are focused not only on addressing fundamental challenges like population growth, resource exploration, and water and food scarcity but also on enhancing security measures.

In our daily lives, from hazardous household chemicals in homes to chemical factories, and from chemical factories to nuclear power plants, there are threats that may pose risks to living organisms and human life. Moreover, on an international scale, the high potential for CBRN agents to be utilized as warfare agents during terrorist attacks underscores their significance. Consequently, the Ministry of Internal Affairs and relevant institutions conduct research on CBRN threats and collaborate with pertinent ministries and organizations. It is crucial to address the existing CBRN threat faced by personnel working in environments prone to such risks. Assessing the strengths and vulnerabilities of identified threats is essential. Equally critical is ensuring that personnel in authorized institutions are equipped to handle CBRN threats, possess expertise in CBRN threats, and are proficient in crisis management.

1 aybuke.turan@gmail.com, aybukeayse.turan@pa.edu.tr

Given the wide range of CBRN agents, the associated threats and hazards are diverse. It is crucial to address these specific risks, considering the working environments of personnel in the management administration of the relevant institution. In incidents stemming from CBRN threats, personnel involved must be well-versed in the security and management protocols of the scene. These events can significantly impact human and environmental health, affecting both society and institutions. For instance, emergency health services play a vital role in addressing health issues resulting from CBRN threats before patients are transported to hospitals. Therefore, CBRN threats not only endanger those directly affected but also pose risks to the personnel responding to such situations initially. Crime scene security and management procedures necessary for the safety of all living beings vary based on the nature and circumstances of each urgent intervention.

To prevent or reduce potential harm to human health and the environment from CBRN threats that could impact Turkey domestically or internationally, it is essential for relevant institutions and organizations to collaborate with law enforcement, security forces, and civilians proactively. Ensuring seamless cooperation and coordination with assigned duties and responsibilities before, during, and after such incidents is imperative.

DISCUSSION

CBRN is increasingly significant globally and in Turkey. The broad scope and numerous hazards associated with the CBRN concept underscore its contemporary importance. Factors like chemical plants, nuclear facilities, epidemics, and chemical and biological warfare represent just a fraction of the risks posed by CBRN threats to human and animal life. Consequently, CBRN threats, pervasive across all aspects of life, consistently entail risks to human and animal well-being. Various pertinent ministries, institutions, and organizations, including the Ministry of National Defense, the Ministry of Health, other relevant ministries, the General Directorate of Security, the Gendarmerie General Command, the fire department, and notably the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Internal Affairs are actively engaged in managing these risks (Duty Regulation on Chemical, Biological, Radiological, Nuclear Threats and Hazards, 2020).

The team responsible for responding to any CBRN threat is AFAD. Injuries caused by such threats are considered life-threatening emergencies. The primary responders in such cases are 112 emergency ambulances. Challenges and uncertainties may arise in addressing CBRN hazards and threats post-incident. This situation can be attributed to various factors:

1) Insufficient societal awareness of CBRN hazards and risks.
2) There are a greater number of CBRN agents than anticipated.
3) The inadequacy of the CBRN threat and management process among ambulance personnel is recognized.

In the following sections, CBRN hazards, weapons, warfares, terrorism are explained.

CHEMICAL HAZARDS

Chemicals encompass elements, compounds, or mixtures that permeate various facets of human existence, boasting a broad spectrum of applications. They exist in natural settings in their pure state, are synthetically manufactured, or arise as byproducts. Pharmaceuticals, food items, paints, cosmetics,

textiles, cleaning agents, pesticides, and more sectors feature their presence. While these chemical entities facilitate human activities, they also pose potential dangers and unintended adverse effects. Hazardous chemicals, crucial for safeguarding the ecosystem and biodiversity, play a pivotal role in diverse industries and applications (Karacan, 2018).

Chemical hazards refer to dangers that result from the deliberate or unintentional discharge of toxic chemicals into the surroundings, posing risks to humans, organisms, and the ecosystem. These hazards are typically categorized into three main groups:

1) Household chemicals encompass products like cleaning and paint materials that contain toxic substances, enhancing the daily lives of individuals. These chemicals are prevalent in various aspects of daily life, found in homes, workplaces, and hospitals, becoming essential to human existence. Despite their widespread use, these chemicals possess significant toxicity and harmful effects that are frequently underestimated. Exposure to household chemicals can transpire through inhalation, skin absorption, or ingestion, leading to adverse health outcomes such as allergies, skin irritation, neurotoxicity, eye irritation, birth defects, and different forms of cancer (Lee and You, 2020). Hence, the safe production and utilization of household chemicals by individuals are paramount. Improper handling and dissemination of household chemicals can escalate to levels that endanger living organisms and ecosystems. Individuals exposed to such chemicals may seek medical attention due to distressing symptoms like breathlessness, eye and skin irritation, dizziness, headaches, vision impairment, and loss of coordination (Gülegen, 2018).
2) Toxic industrial chemicals encompass hazardous substances in solid, liquid, and gaseous states utilized in industrial activities such as production, transportation, storage, and waste handling. Industry embodies the creation, growth, or refinement of essential resources to enhance and streamline human life.
3) Chemical Weapons: Chemicals possessing toxic properties utilized to incapacitate individuals and organisms by causing harm or death, to pollute or devastate food supplies and storage facilities, and to instill fear, disorder, and alarm by rendering vital resources inoperable.

Classification of Chemical Weapons

Chemical warfare involves incapacitating individuals, harming food supplies, and impacting vital economic sectors through the contamination of food, inducing chaos and unrest. These substances possess toxic properties that are harnessed for specific objectives. It is estimated that there are many toxic chemicals classified as weapons in schedule 1, 2 and 3, with a significant likelihood of resulting in fatalities and harm (https://www.opcw.org/chemical-weapons-convention/annexes/annex-chemicals/annex-chemicals). Chemical weapons are categorized into nerve agents (soman, sarin, VX, tabun), blood agents (hydrogen cyanide, cyanogen, arsine, chlorine), choking agents (chlorine, phosgene), and blister agents (lewisite, mustard). Additionally, tear gas, incapacitating agents, vomiting agents, and fire-producing weapons fall under this classification (Yılmaz, 2015). The harm inflicted by chemical agents manifests within moments of vapor or skin contact.

Chemical Warfare

Chemical terrorism involves the use or threat of toxic chemicals by non-state actors to cause harm, death, economic damage, or territorial control for political, religious, or ideological motives. The availability of chemical weapons precursors has increased due to the global nature of the chemical industry, which serves both peaceful and warfare purposes. State and non-state entities seeking to

develop chemical weapons can access numerous instructional materials online. Past incidents have shown that terrorists have conducted chemical attacks and may do so again. Criminals, cults, and other non-state actors have also carried out such attacks. Terrorist groups might steal toxic substances from industrial or research facilities, with less harmful chemicals like chlorine being common targets due to their accessibility. The complexity varies based on the chosen agent, munitions, and delivery system, typically involving three main steps.

Terrorists select and obtain a chemical warfare agent:

1) Assuming terrorists do not steal or obtain ammunition from a state, they develop ammunition. Basic applicable ammunition designs (e.g., explosive smoke device) are widely available. Advanced munitions are more challenging to manufacture and less likely to be produced by terrorists (e.g., dual missile-deliverable warheads).
2) The intricate nature of sophisticated delivery systems like missiles presents a significant challenge for terrorist organizations aiming to execute a successful chemical warfare agent assault. Optimal environmental conditions are essential for the efficient deployment of chemical agents, posing a potential challenge for terrorist groups. While terrorist groups can feasibly create improvised explosive devices with chemical components, these makeshift firing systems lack the effectiveness of more sophisticated methods like missiles.

BIOLOGICAL HAZARDS

It is widely recognized that the Covid-19 pandemic has had severe consequences globally, although its rate of transmission has somewhat decreased. This situation has prompted scientists to consider the potential of this epidemic being used as a biological weapon, leading to the implementation of various measures by both individuals and organizations. Consequently, there has been a heightened focus on enhancing the expertise of law enforcement and security agencies in this domain, as well as fostering collaboration among different institutions. The historical use of biological weapons dates back to ancient times when many nations employed them to gain an advantage in warfare. The escalating destructive capabilities of these weapons have prompted discussions on international legal measures, a topic that remains relevant today. International agreements have restricted the use of biological weapons, with sanctions established to address biosecurity concerns. The potential devastating impact of biological weapons, their propensity for spiraling out of control, and the critical importance of understanding biosecurity due to their lethal nature are all evident. Biological threats are defined as human endoparasites, cell cultures, and microorganisms that have undergone genetic changes capable of causing poisoning, allergies, or infections (Akbulut, 2019). Microorganisms that are highly contagious, easily producible, and can be readily disseminated to nearby communities for malicious purposes such as vaccines and treatments, can be utilized for biological attacks (Von Lubitz, 2005). Bacteria, viruses, and toxins posing biological threats are categorized into classes based on the risks of disease, mortality, and transmission.

Classification of Biological Weapons

Throughout human history, infectious diseases that have naturally emerged have raised the possibility of their potential use in military operations. Biological weapons encompass a range of agents such as bacteria, viruses, fungi, microorganisms, and toxins (Dando, 2000). These infectious agents, including bacteria and viruses, are intentionally employed to induce harmful and lethal effects on living organ-

isms. Bacteria, single-celled microorganisms visible under a microscope and typically ranging from 0.1-10 μm in size, can present a biological hazard. They are categorized into various types such as bacillus, vibrio, coccus, and spirillum, each with distinct beneficial, benign, or disease-causing characteristics. Examples of pathogenic bacteria include Shigella dysenteriae (causing dysentery), Yersinia pestis (responsible for the plague), Coxiella burnetii (associated with Q fever), Vibrio cholerae (causing cholera), various Salmonella strains (linked to intestinal infections), and different Brucella species (causing brucellosis). These harmful bacteria are recognized for their ability to induce illness in the human body. Viruses posing a biological threat are nucleoprotein molecules capable of replicating in living cells, observable through an electron microscope, and responsible for causing diseases. They contain either DNA or RNA. Furthermore, viruses can generate new strains through mutations. Examples of viral agents that can pose biological threats include Hantavirus, Variola major (smallpox), Ebola virus, SARS CoV, Lassa virus, MERS-CoV, and COVID-19. Pathogenic viral agents are easily replicable in human cells post-infection, leading to various diseases. The presence of pathogenic agents represents a public health hazard. Biological hazards include toxins like C. botulinum toxin, Trichothecene mycotoxin, Saxitoxin, Ricin, and Aflatoxin, originating from living organisms and causing toxic reactions in other organisms (Bhaskar and Sant, 2020). Agents with the potential to present a biological threat are categorized into three groups: A, B, and C by the Centers for Disease Control and Prevention (CDC) in the United States, based on factors such as ease of transmission, severity of mortality and morbidity, and potential for utilization (Berger et al., 2016). These agents, which can pose a biological threat, have detrimental impacts on humans and the environment. Their characteristics, including rapid spread, heightened mortality and morbidity rates, and ready accessibility, elevate the risk of their deployment as biological weapons by terrorist organizations and in conflicts.

Bioterrorism

The utilization of agents that can instigate biological threats as biological weapons underscores the notion of bioterrorism. Bioterrorism involves deliberately introducing harmful biological elements such as bacteria, viruses, and toxins into the environment of a targeted community, leading to health and economic repercussions and inflicting material and moral losses on society. Agents capable of initiating biological attacks are employed in acts of terrorism. Consequently, toxins posing a biological threat are appealing agents for terrorists engaging in bioterrorism. One primary reason for the attractiveness of biological toxins is their ease of acquisition. Moreover, many toxins impact the nervous system by impeding the transmission of nerve impulses, thereby heightening their utilization in bioterrorist assaults (Janik, 2019). Examples of agents with the potential for employment in biological attacks include Botulinum toxin, plague, anthrax, and smallpox, among others. Although severe diseases caused by these agents have been managed in contemporary society (Clarke, 2002). Agents designated for use as biological weapons possess crucial characteristics such as effectiveness even in small doses, easy transmission within the community, challenging diagnosis and treatment, high mortality rates, ineffective existing vaccines, and the ability to instill fear and panic in society (Chugh, 2019). Biological warfare, known to spread through individuals with infectious diseases in the 18th century, found its roots in the advancements of bacteriology in the 20th century. For instance, during World War I, the Germans contaminated animals intended for Russia from Romania with glanders and anthrax, allegedly causing the spread of plague in St. Petersburg and cholera in Italy (Noah et al., 2002). The development and production of biological weapons have played a significant role in various war periods, notably during World War II. Despite international efforts through agreements like the Geneva Protocol (1925), the Independent Armaments Commission (1982), the Biological Weapons Convention (1972), and the Chemical Weapons Convention (1993) to regulate these weapons, histor-

ical instances reveal a lack of full compliance. This non-compliance poses a persistent risk of exposure to such agents. For instance, during World War II, Japan conducted experiments with biological weapons resulting in the deaths of approximately 10,000 prisoners due to infections like meningitis and cholera. Similarly, the British conducted biological weapons development on Gruinard Island in 1941, leading to contamination with anthrax spores until its decontamination in 1986. The United States also engaged in biological weapons development at the American Detrick Camp in Maryland from 1943 to 1969, a program terminated by President Nixon. Instances like the Tokyo subway sarin gas attack prompted further experiments with anthrax release. The 2001 anthrax letters sent in the United States resulted in 22 cases of anthrax, causing the death of 5 individuals due to pulmonary anthrax.

RADIOLOGICAL AND NUCLEAR HAZARDS

In the 20th century, advancements and achievements were made in various scientific fields such as medicine, industrial production, agricultural surplus, efficient utilization of resources, and space technology. Progress was notable in multiple domains, including the evolution of warfare strategies during World War I and II, marked by unprecedented investments. The deployment of nuclear and hydrogen bombs by the United States on Japan at the conclusion of World War II altered traditional combat approaches, ushering in an era of destructive capabilities impacting entire nations. The advent of the nuclear age spurred a global race among nations to acquire nuclear armaments for strategic advantage, leading to challenging post-war recoveries for societies. Currently, nuclear and radiological advancements are highly effective technologies employed in the medical sector for treating humans and other organisms.

There is a difference between Radiological and Nuclear Weapons. Nuclear incidents involve detonation of a nuclear device whereas radiological incidents produce radiation without detonation of a nuclear device. A radiological weapon is not a nuclear weapon. Even if uranium or plutonium is spread by a radiological bomb, the blast effect is due only to the high explosive; no nuclear fission occurs, as it would in a nuclear bomb.

On the other hand, in non-war-related disasters and emergencies, nuclear power facilities and medical imaging facilities must consistently be ready for potential risks following an accident or catastrophe.

Classification of Nuclear and Radiological Weapons

There are two methods by which terrorist organizations can acquire nuclear weapons: by attempting to manufacture them or by stealing or purchasing them. When examining the operational concept of nuclear weapons, it is important to note that a nuclear weapon contains sufficient fissile material to create multiple critical masses. However, the weapon remains in a subcritical state until detonation. This means that the fissile material is structured in a manner that prevents neutrons from initiating a chain reaction spontaneously. Depending on how the initially subcritical mass is transformed into a supercritical state, two primary explosive configurations can be identified: weapon type and explosion type. In the weapon type configuration, the fissile material is divided into several distinct pieces, each below critical size, before the explosion. These pieces are then amalgamated using conventional explosives to form a single geometrically suitable (preferably spherical) supercritical mass. On the other hand, in the explosion type configuration, the subcritical spherical mass of fissile material is compressed symmetrically to achieve a supercritical state. A radiological weapon, also known as a radiological dispersion device, is a device created to scatter radioactive material into the environment with

the aim of devastating an area or hindering its utilization. At times, radiological weapons are referred to as "dirty bombs" when they utilize high explosives to disperse radioactive substances. It is important to note that a radiological weapon differs from a nuclear weapon. Even if uranium or plutonium is released by a radiological bomb, the explosive impact is solely due to the high explosive; nuclear fission, as in a nuclear bomb, does not occur. Consequently, the explosive impact of a radiological bomb mirrors that of a conventional bomb utilizing an equivalent amount of explosives.

Nuclear and Radiological Terrorism

Nuclear weapons are created through the process of atom splitting (fission), which involves splitting heavy metal atoms like uranium and plutonium into two unequal parts through neutron bombardment. In the context of these weapons, a kiloton of energy accumulation signifies a force equivalent to the destructive capability of 1.000 tons of TNT. Nuclear warfare is a form of conflict involving the use of nuclear weapons to inflict harm upon the enemy. Distinguished from conventional warfare, nuclear warfare seeks to inflict extensive damage over a vast area in a brief period. The lasting physical repercussions of nuclear warfare span decades or even centuries, setting it apart from conventional warfare. Historically, nuclear weapons have been deployed in battle on two occasions. During World War II, the deployment of nuclear weapons by the United States in the Japanese cities of Nagasaki and Hiroshima stands out as significant instances of their utilization in warfare. Following the conclusion of World War II, the proliferation of nuclear weapons by the United Kingdom, the Soviet Union, the People's Republic of China, and France heightened the risk of a nuclear conflict due to the expansion of nuclear arsenals. The potential for a major nuclear confrontation peaked during the Cold War, particularly as the United States and the Soviet Union engaged in an arms race. The conclusion of the Cold War in 1991 with the dissolution of the Soviet Union marked the conclusion of the "Cold War Era" leading to a substantial reduction in the likelihood of a nuclear conflict between the two superpowers. Subsequently, the threat of nuclear war has transitioned to the peril and menace posed by the proliferation of nuclear weapons and nuclear terrorism. Numerous challenges hinder terrorist groups from acquiring nuclear weapons, resulting in a minimal likelihood of terrorists utilizing such weaponry. Crafting nuclear arms is an arduous endeavor, even for nations. To curb nuclear proliferation, enhancements have been made to the "Nuclear Non-Proliferation Treaty" alongside improved security measures. Strengthening the treaty, decreasing warheads, and bolstering efforts to reduce fissile material will effectively diminish the threat of nuclear terrorism. It is worth noting that while the acquisition and utilization of radiological weapons demand advanced technology, making it challenging for a sophisticated terrorist organization, they are relatively easy to obtain and deploy. Researchers project a 40% likelihood of such an attack happening in the near future (Lugar, 2005).

CONCLUSION

CBRN poses a significant threat to security, requiring police and security forces to coordinate with affiliated organizations, institutions, and ministries. Specialized units and personnel trained in CBRN play a crucial role in crisis management through the implementation of emergency plans. Preparing and planning by relevant institutions, police, and security forces, along with fostering cooperation, coordination, and mutual assistance, are vital for effective emergency response and recovery from chemical, biological, radiological, and nuclear threats.

To effectively and efficiently manage pre- and post-disaster stages, such as modern disaster management in CBRN incidents, it is crucial for our country to be prepared at local, national, and interna-

tional levels. This preparedness involves raising public awareness, adequately training first response teams, and ensuring they have the necessary equipment. To prevent or minimize damages from CBRN threats that may impact human and natural life in Turkey and globally, it is essential for relevant institutions, organizations, police, and security forces to collaborate and fulfill their duties, responsibilities, and coordination before, during, and after CBRN incidents.

During the identification of CBRN agents in CBRN incidents through fundamental scientific methods, encompassing both instrumental and traditional experiments, law enforcement and security personnel tasked with responding to such incidents can promptly identify the agents. This swift identification is crucial for safeguarding their own well-being, as well as the health and safety of individuals in the vicinity and the surrounding ecosystem. By enabling the rapid detection of CBRN agents, basic sciences contribute significantly to minimizing the impact of CBRN incidents and are instrumental in ensuring safety and decontamination measures. Basic scientists are thus tasked with promptly identifying CBRN agents upon the occurrence of an incident, employing pertinent scientific methodologies and informing law enforcement and other security entities. Subsequently, they must strategize on the appropriate intervention methods to mitigate the CBRN threat with minimal risk and harm. Facilitating the dissemination of scientific knowledge on mitigation and security measures is of paramount importance. Given the indispensable and dynamic role of basic sciences in addressing CBRN incidents, it is evident that the significance of basic sciences in managing CBRN threats and security is escalating, close to their importance in various other domains nationally and globally.

The roles of science and technology in addressing CBRN (Chemical, Biological, Radiation, and Nuclear) security challenges are continually evolving as new threats emerge and the existing ones become more complex and the paper outlines several key aspects of this evolution:

1) Advancing Detection and Mitigation: Science and technology are at the forefront of developing methods and tools to detect CBRN threats more effectively. This includes advanced sensors, laboratory analysis, and real-time monitoring systems that can identify hazardous agents and materials.
2) Innovation in Response Strategies: Technological innovations are leading to the development of new response strategies. For example, the use of drones, robots, and other autonomous systems can reduce human exposure to dangerous environments during response operations.
3) Artificial Intelligence and Automation: The document mentions the shift from human-resource-reliant defense strategies to those leveraging artificial intelligence. AI can process vast amounts of data to identify patterns and predict potential threats, enhancing the ability to respond to CBRN incidents.
4) Enhanced Protection Measures: Advances in materials science and engineering are leading to the development of better protective gear for first responders and military personnel, providing improved safety when dealing with CBRN threats.
5) Cybersecurity and Digital Threats: As technology becomes more integrated into CBRN security, the importance of cybersecurity increases. The document indirectly implies the need to protect critical infrastructure and digital systems from cyber-attacks that could compromise CBRN security.
6) Global Collaboration and Information Sharing: Science and technology facilitate global collaboration by enabling real-time information sharing and coordinated responses to CBRN threats. This includes sharing of best practices, research findings, and real-time data.

7) Training and Simulation: Technological advancements have also improved training methods for personnel dealing with CBRN threats. Simulations and virtual environments can provide realistic training scenarios without the risks associated with live exercises.
8) Medical Countermeasures: The document touches on the role of science in developing medical countermeasures, such as vaccines, antidotes, and treatments, to mitigate the health impacts of CBRN incidents.

In summary, the roles of science and technology in addressing CBRN security challenges are evolving to include more sophisticated detection, response, and protection capabilities, leveraging innovations in various scientific and technological fields to stay ahead of emerging threats.

Furthermore, police and security forces must undergo a comprehensive training and development program on CBRN (Chemical, Biological, Radiological, Nuclear) threats and security, covering the nature of dangers, possible scenarios, identifying threats, and response skills. This training should emphasize the following topics:

1) Awareness and Threat Perception: Personnel should be trained to identify different types of CBRN threats and recognize their symptoms. This enables early detection of threats and rapid response.
2) Emergency Management: They should receive training in emergency management to effectively work during and after CBRN incidents. This includes risk assessment, resource management, and building collaborative skills.
3) Protection and Decontamination: Personnel should be trained in the use of equipment to protect themselves and civilians and decontamination procedures. This protects them from potential hazards.
4) Collaboration and Coordination: Collaboration and coordination between different agencies and expertise are vital in CBRN incidents. Police and security forces should learn to collaborate with other first responders, healthcare services, and civilian authorities.
5) Legal and Ethical Issues: Understanding legal and ethical issues related to CBRN threats and acting accordingly is important. This includes compliance with laws and standards when assessing threats and responding.
6) Continuity of Training: CBRN threats and technologies are constantly evolving. Therefore, training needs to be continuously updated, and personnel need to be retrained.
7) Practical Training and Simulations: In addition to theoretical training, practical exercises and realistic simulations help improve personnel skills and ability to respond correctly under stress.
8) International Cooperation: CBRN threats have a transnational nature. Therefore, cooperation with international organizations and information sharing should also be part of the training and development process.

Training and development of police and security forces on CBRN threats and security should not be limited to teaching technical skills but should also include the development of soft skills such as leadership, decision-making, and communication. This way, personnel will be equipped to effectively work in complex and dangerous situations and protect the civilian population.

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DARK WEB – BLACK DEEP BETWEEN PAST AND PRESENT

Hatidža Beriša, PhD[1]
University of Defence, Belgrade, Serbia

Katarina Jonev Ćiraković, PhD Candidate
Aleksandar Ćiraković, PhD Candidate
Faculty of Political Science, University of Belgrade, Serbia

BLACK DEEP WEB AS A CHALLENGE - DARK WEB

Dark Web[2] - black deep network, a space on the global network-Internet, is a logical structure that protects the identity of network users and hides the user's activities on the network. In the era of 5D warfare (disinformation, deception, destabilization, disruption and tailored destruction) the impossibility of personal identity and the possibility of a negative impact on the security of the state are ubiquitous. In the era of counter-terrorism, the dark web was the ICT infrastructure that provided security to terrorist organizations and activists. Such a network provided users with complete anonymity and very good and cheap crypto-protection. Combined with cryptocurrencies, the dark web was a space for terrorist indoctrination, recruitment, propaganda and training. "In the period of the fight against CoVid–19, the dark web services had a significant impact on the information environment and were a place for the spread of propaganda, conspiracy theories and the sale of media stones for the treatment of CoVid–19. During the conflict between Russia and Ukraine, the deep black network and the services it provides have an impact on shaping the information environment of the conflicting parties, but it can be said that it has an impact on the global information environment. The black deep network as a network for protecting the identity and activities of actors in the cyber domain represents a global security challenge in the fight against terrorism, during the CoVid–19 pandemic and in modern conflicts" (Denic, Devetak, 2023).

THE QUEST FOR SECURITY AND ANONYMITY ONLINE

The Internet as a network of all networks should provide all users with the same rights and opportunities. However, the Internet should also provide a certain level of security and anonymity to its users. The level of anonymity and security has been declining since 2000. States are increasingly exercising control in cyberspace to increase security in the physical domain.

The average internet user finds services on the Internet thanks to the internet search engines. The internet search engines such as Google, Bing, Yahoo, Baidu, Yandex, Ask are of great help to the internet users because data are searched through them. The popularity of the search engine depends on the region, but the use of the search engine also depends on the device used by users, for example, phones with the Android operating system use Google as the default browser, while devices with the Micro-

1 berisa.hatidza@gmail.com

2 What is the dark web? The dark web is 6% of the deep web layer. The dark web is not the secure layer. Instead, it is a hidden layer of the deep web and is mostly used for illegal activities like cybercrimes, theft, smuggling, and terrorism.

soft operating system use the default Bing. The most popular internet search engines in the world for all platforms (mobile phone, tablet, desktop, laptop) based on the Statcounter GlobalStats website is Google with 92.20% share, while the second is Bing with 3.42% share (Statcounter Global Stats 2022).

Internet browsers use automated processes to collect as much data as possible on the Internet. Specialized programs analyze databases that are created on the basis of indexed words for each document for which data have been collected. When the user searches for a specific term, the pre-stimulators use their own algorithms to check the database and return information about the term to the user. The user generally receives information that depends on the algorithm of the internet search engine. Internet pages allow the previously mentioned specialized programs to collect data from them in order to make the page visible to as many users as possible. In most cases, website administrators optimize their pages so that search engines rank them higher when the algorithm sends information to the user. The average internet user thinks that the Internet is only what he can find using some of the internet search engines. However, the Internet is much larger than websites can index. The total percentage of indexed data on the Internet is estimated at about 5% (60 Minutes CBS News 2015). "The rest of the unindexed web pages are called the deep web, hidden web, or invisible web. The mentioned estimate of 5% is based on the total Internet traffic" (Denic, Devetak, 2023).

At the very beginning of the Internet, web pages were static and easy to index, but with the development of new technologies, things are becoming more and more complex. Dynamic web pages that cannot be indexed by conventional web browsers appear. A static website is linked to a single location on the Internet and the data on that page change from time to time. On the other hand, dynamic internet pages are more complex and the only thing that is sometimes constant is the page frame, while the data on the page depend on the data that the user requests. These pages are created based on the data requested by the user and are populated from related sources requested by the user. Dynamic pages are becoming more and more common, and therefore the unindexed part of the space between what is visible and what is invisible on the Internet begins to grow. In 1994, the term invisible web was introduced. The term refers to the information that was not visible to conventional internet browsers for that time period (Bergman, 2001).

The term invisible network had been used until 2001, when Michael K. Bergman introduced the new term - deep web in his work "The deep web: Surfacing Hidden Value". The antonym of the deep web becomes the surface web, which was previously called the visible web. The surface network is the part that the average internet user considers to be the Internet.

The deep web does not only represent internet pages that cannot be accessed directly through conventional browsers. The deep web represents content on the Internet that is:

1) Inaccessible via conventional internet browsers,
2) Accessible only through targeted queries or keywords,
3) Protected from algorithms used by internet browsers,
4) Protected by security mechanisms (user accounts, passwords...),
5) Protected by a logical or encrypted structure that is inaccessible from the outside (Denić, Devetak,2023).

After the year 2000, internet browsers improved so that they can collect information from databases of dynamic internet pages. In his work Bergman (Bergman) estimates that the deep network is 500 times larger than the surface network. It is assumed that the surface network is only 0.25 to 5 percent of the total Internet. The estimate of the size of the surface Internet is based on the data obtained by monitoring the status of the Internet. Currently, the Internet is used by slightly more than 5.46 billion users,

while in the same period of 2016, the number of Internet users was 3.48 billion (Country Cassette - Real Time World Statistics 2022). The number of internet users has grown by about 57% in the last 6 years, which makes it the fastest growing multinational shared domain. This multinational domain is part of the world information domain, economy, state apparatus, army, etc. In order to protect their own national interests, countries are trying to legalize the control of the Internet on their territory and beyond. This control has already been established by various actors.

The first example of a state that controls activities on the Internet is the Russian Federation, which has controlled all electronic communications on its territory since 1996 (Blake, 2016). The system of operational investigative activities [Sistema tehnicheskih sredstv dlya obespecheniya funktions Operativno-Rozysknykh Meropriyatij-SORM] is a system that all providers of telecommunication services must have. SORM is equipment that allows the Federal Security Service of the Russian Federation-FSB to duplicate user traffic and store it for its own needs. This system monitors mobile and landline telephone communications, monitors internet communications and collects all data of all types of communications as target data and stores them for up to three years.

Another example is of course the United States of America, which carried out similar activities at the same time as the Russian Federation. The National Security Agency (NSA) has implemented the Planning Tool for Resource Integration, Synchronization, and Management (PRISM) to collect data from telecommunications service providers in the US. Prior to that, the Upstream program had been used to eavesdrop on international lines passing through US territory. More about these programs and the highly offensive presentations that Edward Snowden gave to journalists in 2013 to show what the US was doing can be found on the website of The Washington Post (The Washington Post 2013).

Given that the data of internet users are in any case controlled by the state authorities of their country or by the security services of foreign countries, a significant number of internet users began to look for new network services on the Internet that would provide them with a certain level of privacy and security.

The deep web was one of the solutions to get out of the totally controlled network environment of the surface internet. In the beginning, users protected their privacy by using virtual private network services [Virtual Private Network–VPN] and proxy programs. In the period before 2001, The Freedom Network from Zero–Knowledge System, Inc. was a privacy network. It was a commercial service and was used only by those who could afford to pay for such a service. Since the use of the service was not free, this service did not experience expansion throughout the globe.

Another project, which aimed to protect privacy and increase security on the Internet, is The Onion routing-Tor. The project started on September 20, 2002. Tor is a routing protocol that enables anonymity in end-to-end routing. Network watchdogs, network operators, or government officials cannot determine the source and destination of data sent over the network. It should be noted here that it is possible to see that a user is using Tor, but his activities cannot be seen, nor can the activities and identity of the user accessing the services be revealed on the server of the hidden services. This network is supported by volunteers who maintain the "relays" and "bridges" in the network and they donate their data flow and processing power to the needs of the network's functioning. The network was primarily developed for the needs of the US Navy, but after the program was abandoned and transferred to the hands of volunteers, there was a mass use and improvement of the service. According to data from the website torproject.org, the users of this network are:

1) People who want to protect their privacy,
2) Journalists and their readers,

3) Security authorities,
4) Activists and whistleblowers,
5) Persons of high and low "profile",
6) Directors of companies,
7) Bloggers,
8) Army,
9) IT experts (Denić, Devetak,2023).

The official Tor website does not list all users of this anonymity service. The advantages provided by hidden services, primarily end-to-end anonymity, cheap and high-quality data encryption, are extremely attractive to people who do not care much about legality, ethics and the prosperity of mankind. Due to the surveillance on the surface network, they begin to use hidden services to spread a variety of illegal activities and take advantage of the opportunities that the network provides. In the part of the deep Internet via hidden Internet links, adult content, material distributed by pedophiles, immoral forums, chat services, training and recruitment material for terrorists, fundraising for illegal activities, human and organ trafficking, and the black market can be accessed (drinking, sneering, hiring assassins, etc.). This illegal part of the deep internet is called the dark web. The black deep web can be defined as a part of the deep web that contains generally illegal and anti-social information that can be accessed either through conventional or specialized internet browsers using a secret internet link (Dilipraj 2014:124).

THE POTENTIAL OF THE DARK WEB IN THE FIGHT AGAINST TERRORISTS

The dark web was considered an ideal ecosystem for Islamic State in Iraq and the Levant-ISIL's activities (Berton 2015). In November 2015, after the attacks on Paris, ISIL used the hidden services of the dark web to spread propaganda. There are three main reasons for this (Denić, Devetak,2023).

First, they want to avoid censorship of their internet pages on the surface network.

Secondly, the content of internet pages on the dark web can only be accessed if the data on the access method are available, and the network itself protects the identity of the persons who want to access the information on the pages in question or administer those pages during access to that content.

Third, the content on the dark web is protected from hacker activities. The terrorist attack on Paris in 2015 triggered the Anonymous hacktivist group to launch "Operation Paris" (Blake, #OpISIS and #OpParis: Anonymous hacktivists to retaliate against ISIS after Paris attacks 2015). The result of this operation was the removal of hundreds of websites on the surface network that were linked to ISIL. Unfortunately, websites did not completely disappear from the global Internet, but administrators migrated them to the dark web. In order to continue accessing the pages in question, the Telegram application published a link that was a link to the black deep web, using Tor technology, to the pages "onion".

One of the most important activities for which terrorist organizations use the black deep network is the collection of funds and the anonymous transfer of funds for the black market of weapons, opiates, ordering murder and other trade in illegal goods and services (Denic, 2017). Fundraising using the dark web combined with anonymous transactions provided by cryptocurrencies increases actors' resistance to detection and seizure of funds. Cryptocurrencies, such as for example Bitcoin–BTC and

lately the increasing primacy in anonymous transactions Monero–XMR, have a significant role in massing users who want anonymity on the Internet (Rudes 2020). XMR is currently considered the cryptocurrency that provides the highest degree of privacy and anonymity. The transactions of this cryptocurrency are almost impossible to track, and this is one of the reasons why XMR is the choice of persons or actors who are engaged in illegal trade or concealment of income in order to avoid taxes (Denic, 2017).

Cryptocurrencies act the same as cash in the payment system. It is very difficult to track such transactions because there is no official intermediary, a bank that mediates transactions. When there is an official intermediary in the transaction, that person as a party to the business, has the obligation to submit data on the transactions based on a court order to the authorities conducting the investigation.

For example, the website "Fund Islamic Struggle Without Leaving Traces" existed on the dark web for all donors who were willing to anonymously fund the holy war [Jihad] in BTC currency (Weimann, 2016).

The black market on the black deep web is full of electronic stores for the trade of drugs, weapons, ammunition, lethal means, forged IDs, personal data, payment card duplicating data, banned books, etc.

The next example of how terrorist organizations use the dark web is the case of a small terrorist cell from Indonesia. In addition to organizing fundraisers on the dark web, terrorists used stolen identity information, also provided through the dark web, for stock trading on the Forex surface network website (Pearson, 2016). This group managed to collect about 600,000 US dollars with several cybercriminal activities (Weimann, 2016).

One of the most famous sites for trading in illegal goods is The Silk Road 2.0. The arrest of the administrator of the site closed the trade in illegal items on the dark web only temporarily, but sellers and buyers quickly found alternatives. Silk Road 2.0, an illegal online trading site on the dark web, is an example of profitably taking advantage of the black deep web to make money. Similar to internet trading sites on the surface network, the Silk Road 2.0 site offered a wide range of illegal items (opiates, weapons, contract killing services). This website was the guarantor of the transaction between the buyer and the seller. A customer who would order illegal items from the Silk Road 2.0 site would pay for the items in the cryptocurrency BTC. The money remained in the possession of the site until the customer received the goods. When the buyer received the goods, Silk Road 2.0 transferred funds to the seller in cryptocurrency. Of course, the black deep web site took a commission of 8 to 15 percent for those transactions. The FBI estimated that the site had about 150,000 anonymous users and about 4,000 sellers. The value of total trade by July 2013, when the website was discovered, was over 1.2 billion US dollars (Sui, Caverlee and Rudesill 2015). It can be assumed that part of the profits from the sale of illegal goods ended up in the hands of terrorists around the world.

The kill list is a very interesting example of psychological effects on persons working in state institutions. Namely, the kill list was published between March and May 2016 by three pro-Islam hacker groups (SITE Intelligence group 2016). The kill list contained information on US citizens and government officials who were to be killed. The aim of this operation was to wake up the "lone wolves" who should carry out the execution. For the execution of persons from the "lone wolves" kill list, they would receive a monetary reward in crypto-currencies, which was specifically defined for each person individually. The link to access the data was extended through the Telegram service. The personal data in the kill list were not obtained by those hacker groups, but were purchased on the black market of the deep web from hackers who made a material profit by stealing and selling personal data from social networks without knowing what the data would be used for later.

THE IMPACT OF THE DARK WEB ON THE GLOBAL INFORMATION ENVIRONMENT DURING COVID-19

Internet pages, social networks and forums play a significant role in shaping perception, opinion and behavior in crisis situations. In the period of the crisis caused by the CoVid−19 virus infection, disinformation could and did pose a great danger to security although it seemed to be harmless in nature. Internet sites where conspiracy theorists shared half-truths and lies about security measures, the origin of viruses and vaccinations quickly fell under state censorship around the world. As with the Paris operation, in this case citizens who are supporters of conspiracy theories continued their search for information and the spread of disinformation on the pages of the black deep web. Due to censorship on the surface network, there was a migration of pages from the surface to pages of the black deep network. The information posted on the pages of the black deep web became extremely dangerous because most users accepted it as authentic and more accurate than the information provided by government authorities (Topor, Shuker, 2020). When you add to this the anonymity in the interaction that the network provides to users, their trust in shared information increases even more, and the black deep network becomes an environment for creating a global polarization of society into those who trust state authorities and those who do not and are already organized as internet clans. Although it is believed to be a small percentage of the population that used the dark web for discussions and exchange of "information" globally, there are always physical circles of these people who could spread this disinformation very easily (Bracci, 2022). In order to determine the percentage of the population that used the black deep web, a survey on the use of the black deep web as a source of information for CoVid−19 was conducted by three countries (United Kingdom, Sweden and Finland) (Sirola, et al. 2022). The results of the study show that a certain percentage of citizens of these three countries used the black deep web as a source of information during the CoVid−19 pandemic. In the United Kingdom, 19 percent of the total sample searched for information on the dark web. Persons who used the dark web fit the following profile: young people who had advanced knowledge in the use of internet technologies.

In the age of the CoVid−19 pandemic, websites for the trade of prohibited substances were also unavoidable. An illustrating example is the vaccine trade long before the vaccines were approved. On one of the pages of the black deep web, there was an ad for the sale of vaccines in cryptocurrencies at a price equivalent to 5,000 US dollars. Such ads not only spread misinformation, but also put the health of people who bought such untested substances at risk (Topor, Shuker 2020). Sites selling illegal items offered protective masks, drugs such as chlorquine, hydrochlorquine and azithromycin (Jarmon, 2020). "The offer included instructions for business entities of Western countries to collect money from the state due to the CoVid−19 pandemic, internet domains that had connections with corona in their names, medical devices that supposedly detect CoVid−19, tests to confirm CoVid−19, fake medical documentation about the virus and respirators" (Denić, Devetak,2023).

DARK NETWORKS OPERATING DURING THE CONFLICT IN UKRAINE AND THE GLOBAL THREAT

Illegal sales services are used on the dark web in the latest conflict between Russia and Ukraine. An ad appeared on one of these services about the sale of American-made anti-tank missiles called Koplje [Javelin]. On the trading page, this rocket was being sold at a price of US$30,000 (the actual price of a rocket like this is around US$200,000). Payment for this weaponry was to be made in cryptocurrency

around 150.05 XMR (AtlasNews 2022). A seller from Kiev claimed that he could provide the transport of the ordered goods to Poland, an EU country. It is still too early to determine whether this is a real offer of anti-tank weapons or part of Russian propaganda. What is certain is that such activities, even though they are on the dark web, have an impact on the global information environment. The Russian side is using this offer for the purposes of an information campaign in order to influence public opinion in Western countries. The main message that the Russian side sends to Western public opinion is that although they donate weapons and equipment, it ends up on the black market and that taxpayers' money ends up in the pockets of war profiteers. On December 9, 2022, Russia requested an urgent session of the UN Security Council, at which the Russian ambassador to the UN stated that the weapons supplied by Western countries to Ukraine were increasingly ending up in the hands of terrorists not only in Europe, but also in Africa and the Middle East. On the other hand, Ukraine treats the appearance of the sale of donated weapons on the dark web as part of Russian propaganda aimed at undermining the trust of Western public opinion in the Ukrainian state apparatus (FOXBusiness 2022).

The activities of hackers are fully in line with the actions of the countries from which they operate. Before the conflict in Ukraine, Russian hackers had a code of not attacking countries that emerged from the USSR. After the conflict started on February 24, 2022, geopolitical tensions were also reflected in the dark web and hackers from both sides started online activities beyond the code. Groups of hackers often use forums, websites where information is posted [paste sites], applications for secure communication [Telegram, Signal...] and finally specially built websites that support the actions they carry out and serve to plan the activities of each party. The available means of communication often serve hacker groups in the current conflict to communicate sensitive information to the other party and to agree and plan future online activities. When we talk about the disclosure of sensitive information, information related to state agencies, the army, political bodies, as well as private companies and groups that are connected to the parties to the conflict are published in a targeted manner. The Russian hacking group Free Civilian uses the black market of the deep web to offer for sale data from the databases of state institutions of Ukraine that have been the object of hacking attacks. Among these data are data from the electronic administration service https://diia.gov.ua/ [Deržavní poslugi online], the Ministry of Internal Affairs https://wanted.mvs.gov.ua/ [Mínisterstvo vnutríšních sprav Ukraí" ni] and the like (Webz.io 2022).

In addition to citizens' data, links to confidential documents belonging to the operational command "North" of the Army of Ukraine were posted on one of the most popular Russian hacker forums, xss.is.

On the other hand, the Shadow Hunters hacker group from Ukraine uses the service https://pastebin.com to post information and anonymously distributes a large number of Internet addresses that need to be attacked during the hacking operation. Among the sites defined as targets are the site of the Russian president http://20.kremlin.ru and sites linked to the kremlin.ru domain.

The black market of the deep web is an ideal place for hackers who possess knowledge that can easily be monetized. When they do that, they do not think about the consequences, but only about the profit made by publishing sensitive data. The disclosure and sale of the data on the critical infrastructure of companies, especially the data on nuclear facilities and the data on people who possess information on essential production processes bring profit to the persons who sell but increases the degree of endangerment of persons and objects. Cyble, a company that monitors the dark web, notes that the number of cyber attacks on nuclear facilities around the world is increasing. Pro-Western analysts cite the reason for the increase in attacks as a consequence of Russia's intervention in Ukraine. Beginning in February 2022, about eight disclosures of critical information appeared on cyber forums on the dark web. The disclosed data related to nuclear facilities in Russia, Brazil, Iran, Taiwan, Indonesia, Thailand,

India and South Africa (Lapienytė 2022). Although nuclear facilities have air-gapped networks, the assumption is that the attacks were successful because they took advantage of network misconfigurations, exposed network elements, vulnerabilities in network control systems, and social engineering. The data that appeared on the deep black web ranged from internal documents of nuclear plants, source codes of software used by energy companies, information on key nuclear plant personnel, construction plans and details of plant equipment. Those data were the so-called gold mine for future attackers. They were key to developing specialized malware, auditing controller firmware, and gaining access to organizations dealing with nuclear facilities (Denic, Devetak 2023).

Since the beginning of the conflict, the effects on the information environment from cyberspace have not been forgotten even by countries that are not involved in this conflict. In order to influence public opinion and the economic conditions of the Republic of Serbia, anonymous reports appeared about the placement of bombs in elementary schools, state institutions and on flights between Belgrade and Moscow (Denić, Devetak, 2023). In accordance with the procedures in the Republic of Serbia, this type of threats must be checked by specialized teams in order to protect the civilian population. There is an assessment that these threats were created with the aim of changing the official state policy of the Republic of Serbia and the position of the Republic of Serbia regarding the conflict. The impossibility of identifying the source of the threat, as well as the territory from which the threatening electronic messages were sent, was achieved thanks to the high level of awareness of the application of operational security measures - OPSEC of the actors who generated the threat. Operational security is defined as the process of protecting sensitive and/or critical information from hostile reconnaissance and collection in a way that traditional security programs cannot protect. The method of applying the operational security of the actor will be described below. The source of the threat uses an e-mail exchange service, in this case Proton Mail was used as the service for sending messages. This service provides end-to-end protection of messages, does not require identification from the user when opening an account. The mentioned service protects the user's internet address, so that the source of the threat at a given moment cannot be geolocated based on the address. The advantage of this service is also in the laws of Switzerland (the server is located in Cern), which is neutral militarily and politically, all in order to protect free speech. With this service, as with other e-mail services (Google, Microsoft, Yahoo...), the company has the right to access electronic data on the server, but while popular providers of these services companies can access the data, Proton Mail data cannot be accessed by the company because it is encrypted and only the sender and receiver have the decryption data. It is certain that the threat addressed to institutions and companies in the Republic of Serbia is a terrorist act, and it would be logical for Proton Mail to provide data on the source of the threat at the request of the investigative authorities of the Republic of Serbia, which would only be possible in this case (Denić, Devetak,2023). Unfortunately, the source of the threat implements its own operational security measures. One of the operational security measures is to open an account and access the service through the deep web at the service address https://protonirockerxow.onion/. For the authorities of the Republic of Serbia, this is an approach from the black deep network, given that the threat is aimed at undermining the security of a sovereign state. Services that are combined in order to achieve complete operational security in cyberspace are Tor, Telegram, Signal, Pasteit, Pastebin, I2P

CONCLUSION

Based on the above, it is concluded that the Black Deep Network remains anonymous, especially taking into account that there is a high degree of crypto-protection of the exchanged information, which are reflected in the diversity and the possibility of combining different services and electronic

tools that increase the operational security of network users and reduce the ability of state authorities to identify actors. Black deep web services are a reflection of the real situation on the global stage and are used by non-state and state actors. The variety of possibilities that the dark web provides to users does not mean that it is a silver bullet against state institutions, law and order. There are examples that show that it is possible to identify service users and geolocate servers that provide services. Exposing service users and administrators is always due to non-compliance with operational security measures. However, serious actors when working in the dark web apply these measures. Tools to access the dark web do not have technological flaws that can be exploited to expose actors and track their intentions.

The various services of the Black Deep Network are particularly prominent, as well as the platforms for psychological and information operations, propaganda dissemination, online indoctrination, recruitment and mobilization, virtual training of actors, planning and coordination of cyber operations, arms trade, trade of essential information about critical infrastructure and information about people who have knowledge of certain technologies, to collect funds and commit financial fraud with personal data.

It is especially important to point out how much the transition from the surface to the deep and black deep network for all users and especially for the development of services provides opportunities for the complete protection of actors, creates an environment in which the sources of the threat are uncertain, the motives of the actors are hidden or masked, and new threats do not have the same patterns as before, In such an environment, it is increasingly difficult to get the right information, make assumptions, perform analyses, define tactics, techniques and procedures as responses to threats.

The threats that come from the black deep web are a potential danger to the information environment and their diversity represents the adaptation of the black deep web to the needs of the physical environment and geopolitical circumstances.

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INNOVATIVE SOLUTIONS FOR SECURITY CHALLENGES: INTEGRATING NATURAL AND APPLIED SCIENCES IN THE EMERGING THREAT OF AI-DRIVEN CYBER ATTACKS – BIBLIOMETRIC ANALYSIS

Alexandru Ioan, PhD[1]
Department for Emergency Situations, Ministry of Internal Affairs, Romania

PURPOSE

The Proliferation of Artificial Intelligence

Artificial Intelligence (AI) has witnessed significant growth over the past decade, transforming various sectors, including healthcare, finance, and transportation. The exponential increase in computational power, coupled with the availability of large datasets, has fueled the development and deployment of advanced AI systems (LeCun et al., 2015). These systems are capable of performing complex tasks with high precision, such as natural language processing, image recognition, and autonomous decision-making (Goodfellow et al., 2016). The integration of AI into everyday applications has revolutionized the way we interact with technology, leading to increased efficiency and novel capabilities.

However, the rapid proliferation of AI also poses significant challenges, particularly in terms of security. AI systems, while powerful, are not infallible and can be exploited by malicious actors. Adversarial attacks, wherein small perturbations to input data can cause AI models to make incorrect predictions, exemplify the vulnerabilities inherent in AI technologies (Szegedy et al., 2013). These vulnerabilities necessitate robust security measures to safeguard AI systems against exploitation.

The integration of AI in cybersecurity has been extensively studied, highlighting its dual role in both fortifying defences and introducing novel threats. Brundage et al. (2024) discuss the broadening threat landscape due to AI, emphasizing that while AI technologies can enhance cybersecurity measures, they also bring about new types of vulnerabilities (Brundage et al., 2024). Similarly, the work of Security Magazine (2024) highlights current trends where AI automates cybersecurity operations to address zero-day threats, exploiting vulnerabilities that traditional methods fail to detect.

Cybersecurity Challenges

The digital age has brought about an increase in cybersecurity threats, with cyber-attacks becoming more sophisticated and widespread. Traditional cybersecurity measures, which rely heavily on signature-based detection methods, are often inadequate against the dynamic nature of contemporary threats (Symantec, 2019). Cybercriminals are leveraging AI to enhance the sophistication of their attacks, creating a scenario where defensive measures must evolve rapidly to keep pace with offensive strategies.

1 aioan.mail@gmail.com

AI-driven cyber-attacks pose unique challenges. For instance, AI can be used to automate phishing attacks, making them more convincing and harder to detect (Bose & Leung, 2018). Additionally, machine learning algorithms can be used to identify vulnerabilities in systems and exploit them before they are patched (Li et al., 2018). This evolving threat landscape underscores the need for innovative solutions that integrate advanced AI techniques for cybersecurity defence.

The Convergence of Natural and Applied Sciences

Natural and applied sciences provide the foundational knowledge necessary to develop advanced AI algorithms and cybersecurity protocols. Research by the Department of Homeland Security (2024) underscores the importance of scientific research in understanding and mitigating cyber risks associated with AI. The interdisciplinary nature of this research is evident in studies such as those by Marsh McLennan (2022), which explore the application of AI in life sciences and its implications for cybersecurity.

Recent literature has focused on innovative AI-driven solutions to address cybersecurity challenges. The work by ArXiv (2024) on autonomous threat hunting represents a paradigm shift, leveraging AI to proactively identify and neutralize threats. This proactive approach is also discussed by the Atlantic Council (2023), which examines the potential uses of generative AI systems in cybersecurity and the resulting new threat vectors.

Addressing the complexities of AI-driven cybersecurity threats requires a multidisciplinary approach that converges natural and applied sciences. The integration of principles from biology, physics, and mathematics with computer science and engineering can lead to the development of more robust and adaptive security solutions (Helbing, 2012). For example, biological systems exhibit resilience and adaptability, qualities that can inspire new cybersecurity strategies. The concept of immune system-inspired defences, which mimic the human immune system's ability to detect and neutralize pathogens, has gained traction in cybersecurity (Dasgupta, 1997).

Furthermore, the application of quantum computing in cryptography represents another intersection of natural and applied sciences. Quantum cryptography, which leverages the principles of quantum mechanics, offers the potential for unbreakable encryption methods that could safeguard against even the most advanced AI-driven attacks (Bennett & Brassard, 1984). The convergence of these diverse scientific domains can thus provide innovative solutions to emerging security challenges.

Evolving Security Threats

The landscape of security threats is continually evolving, driven by advancements in technology and changes in the socio-political environment. AI-driven cyber-attacks are a prime example of how threats are becoming more sophisticated and harder to predict. These attacks can target critical infrastructure, financial systems, and personal data, leading to significant economic and societal impacts (Herzog, 2017).

To combat these evolving threats, it is imperative to adopt a proactive and holistic approach to cybersecurity. This includes the development of AI systems capable of detecting and responding to threats in real-time, as well as the implementation of adaptive security measures that can evolve alongside the threat landscape (Sommer & Paxson, 2010). Additionally, international collaboration and information sharing are crucial in addressing the global nature of cyber threats.

Interconnection and Purpose

The purpose of this paper is to explore innovative solutions for security challenges by integrating natural and applied sciences in the context of AI-driven cyber-attacks. The proliferation of AI has brought about significant advancements but also poses substantial cybersecurity challenges. Addressing these challenges requires a multidisciplinary approach that leverages the strengths of both natural and applied sciences.

This paper employs bibliometric analysis as a key tool to bridge the gap between natural and applied sciences and cybersecurity. Bibliometric analysis enables a systematic examination of the scientific literature, allowing us to map out research trends, identify influential works, and understand how different disciplines intersect and contribute to cybersecurity research. By analysing publications from fields such as biology, chemistry, physics, computer science, engineering, and mathematics, we can uncover patterns and connections that might not be apparent through traditional literature reviews.

The increasing number of publications in this area indicates growing academic and practical interest. Research by Intereconomics (2024) and AI Business (2024) highlights the evolving digital security landscape, with AI being pivotal in gathering and analysing threat intelligence. Furthermore, studies like those by the Institute of Data (2024) emphasize the continuous development of AI technologies to enhance protection and defence mechanisms against cyber threats.

The literature on AI, cybersecurity, and natural and applied sciences illustrates a rapidly evolving field characterized by interdisciplinary collaboration and innovation. The integration of AI into cybersecurity strategies offers promising solutions but also necessitates careful consideration of new vulnerabilities. Future research should continue to explore these intersections, focusing on developing robust, AI-driven security measures that leverage the strengths of natural and applied sciences. The ongoing bibliometric analysis will provide valuable insights into the progression and impact of research in this critical area.

Through bibliometric analysis, this study will:

Identify Research Trends: By examining the frequency and evolution of topics related to cybersecurity and AI in natural and applied sciences, the paper can highlight emerging trends and shifts in research focus. This helps in understanding which interdisciplinary approaches are gaining traction and why.

Highlight Influential Works and Authors: The analysis will pinpoint key publications and researchers that have significantly contributed to the intersection of these fields. Recognizing these contributions can guide future research efforts and foster collaborations that build on established foundations.

Map Collaboration Networks: Bibliometric techniques such as co-authorship analysis will reveal how researchers from different disciplines collaborate on cybersecurity challenges. This can provide insights into how interdisciplinary teams are formed and how they function, offering a model for future collaborative efforts.

Discover Research Gaps: By visualizing the distribution of research across various topics and disciplines, the paper can identify areas that are underexplored. These gaps represent opportunities for new research that can further integrate natural and applied sciences into cybersecurity.

Evaluate the Impact of Interdisciplinary Approaches: The study will assess the citation impact of interdisciplinary research compared to more siloed studies. This evaluation can demonstrate the practical value and influence of integrating different scientific perspectives in developing robust cybersecurity measures.

The convergence of natural and applied sciences with cybersecurity through bibliometric analysis can lead to the development of more resilient and adaptive security measures. For instance, innovations like immune system-inspired defences from biology and quantum cryptography from physics exemplify how interdisciplinary research can enhance cybersecurity. By systematically analysing the literature, this study aims to highlight such innovative approaches and their practical implications for cybersecurity.

This paper uses bibliometric analysis to systematically explore and bridge the gap between natural and applied sciences and cybersecurity. This approach not only enhances our understanding of the current research landscape but also identifies and promotes interdisciplinary solutions that can effectively address the complex and evolving nature of AI-driven cyber-attacks. Through this comprehensive analysis, the study underscores the critical importance of integrating diverse scientific fields to develop robust, adaptive security measures capable of withstanding modern cyber threats.

DESIGN/METHODS/APPROACH

Research Objectives and Approach

The primary objective of this research is to elucidate innovative solutions to bolster cybersecurity resilience by integrating insights from natural sciences (biology, chemistry, and physics) and applied sciences (computer science, engineering, and mathematics). This study employs a bibliometric analysis to investigate the scientific outputs in the domains of artificial intelligence, cybersecurity threats, and natural and applied sciences. The key goals include identifying the most studied topics, universities with the most publications, top journals in the field, prolific authors, and prevalent keywords. Additionally, case studies will be incorporated to demonstrate the practical application of interdisciplinary approaches in enhancing cybersecurity resilience.

This study will rely on secondary research, utilizing the existing literature and publications to perform the bibliometric analysis. The rationale for this approach is to leverage the extensive body of knowledge available in scientific databases to extract meaningful patterns and trends that can inform cybersecurity practices.

Sampling Methods and Criteria

In this study, a sample size of approximately 500-1000 publications was deemed appropriate for conducting a robust bibliometric analysis at the intersection of artificial intelligence, cybersecurity threats, and natural and applied sciences. This sample size allows for a thorough exploration of recent advancements and emerging trends within the field while ensuring sufficient coverage of diverse research outputs. By analysing a sizable number of publications, we aim to capture the breadth and depth of scholarly work, facilitating a comprehensive understanding of the interdisciplinary approaches utilized in addressing contemporary cybersecurity challenges. Furthermore, this sample size strikes a balance between the need for detailed analysis and the practical considerations associated with data collection and processing.

The sampling strategy for this study involves a meticulous selection process aimed at capturing the most relevant and up-to-date publications in the domains of artificial intelligence, cybersecurity threats, and natural and applied sciences. The criteria for inclusion are detailed below:

Reputable Scientific Databases: The primary sources for data acquisition will be *Crossref.org*, *OpenAlex.org* and *Scopus.com*. These databases are widely recognized for their comprehensive coverage of scholarly literature across various disciplines, ensuring access to a diverse range of publications.

Publication Relevance: Only publications directly related to *artificial intelligence*, *cybersecurity threats*, and *natural and applied sciences* will be considered for inclusion. This criterion ensures that the dataset encompasses research articles, conference papers, and review papers that contribute directly to the study's objectives.

Peer-Reviewed Publications: To maintain the highest standards of academic rigor and quality, only articles published in peer-reviewed journals and conference proceedings will be included. Peer review serves as a validation process, ensuring that the published work meets the standards of scientific excellence and reliability.

Timeframe: The study will focus on publications from the last decade (2014-2024) to capture recent advancements and emerging trends in the field of cybersecurity. This timeframe aligns with the rapid pace of technological innovation and provides insights into the latest developments shaping cybersecurity practices.

Availability of Citation Data: Publications with available citation data will be prioritized to facilitate robust bibliometric analysis. Citation data serve as valuable indicators of research impact and influence, allowing for the identification of highly cited works and influential authors within the field.

DATA COLLECTION METHODS

The data collection process for this study involves a systematic approach to retrieve essential metadata from selected scientific databases. The following steps outline the specific procedures employed:

Database Search: The initial phase entails conducting comprehensive keyword searches across prominent scientific databases, namely *Crossref.org*, *OpenAlex.org* and *Scopus.com* such as "cybersecurity", "artificial intelligence", "natural sciences", and "natural and applied sciences" will be utilized to identify relevant publications within the scope of the study. These searches will target articles published between 2014 and 2024, encompassing the most recent advancements in the field.

Data Extraction: Upon identifying relevant publications, metadata extraction will be performed to gather key information associated with each publication. This includes details such as authorship, publication year, journal name, keywords, and citation metrics. By extracting these data points, a comprehensive dataset will be compiled for subsequent analysis.

Data Cleaning: To ensure the integrity and accuracy of the dataset, rigorous data cleaning procedures will be implemented. This involves the identification and removal of duplicate entries and erroneous records that may arise during the data extraction process. By eliminating redundancies and errors, the dataset will be refined to reflect reliable and high-quality information conducive to robust analysis.

Through these meticulous data collection procedures, the study aims to compile a comprehensive dataset of relevant publications in the fields of artificial intelligence, cybersecurity threats, and natural and applied sciences. This dataset will serve as the basis for an in-depth bibliometric analysis, enabling the identification of key trends, insights, and relationships critical to understanding today's cybersecurity challenges and advancing resilience strategies.

Descriptive Analysis: Basic statistical measures will be calculated to provide insights into the distribution of publications over time, the prevalence of articles across journals, and citation metrics such as citation counts.

Network Analysis: Utilizing tools such as VOSviewer, co-citation and bibliographic coupling networks will be constructed to identify research clusters and influential papers. This analysis will offer valuable insights into the interconnectedness of research themes and the impact of seminal works within the field.

Keyword Analysis: Employing the Bibliometrix package, keyword frequency and co-occurrence will be analysed to discern emerging trends and hot topics in cybersecurity research. This analysis will provide valuable insights into the evolving landscape of research interests and priorities.

STATISTICAL METHODS AND VALIDATION

In the context of the research, cluster analysis techniques, applied in a temporal frame, offer valuable insights into the collaborative networks and intellectual landscape of the field. Co-authorship analysis helps identify clusters of researchers who collaborate on topics related to innovative security solutions and AI-driven cyber-attacks. By examining co-authorship patterns, the paper can pinpoint key individuals or research groups shaping the discourse in this domain, shedding light on collaborative trends and potential interdisciplinary collaborations.

Furthermore, bibliographic coupling and co-citation analyses provide deeper insights into the intellectual structure of the field. Bibliographic coupling reveals clusters of documents that share common citations, unveiling seminal works and closely related research themes. Co-citation analysis, on the other hand, uncovers clusters of documents frequently cited together, highlighting influential publications and mapping out the intellectual landscape of the research domain. By leveraging these cluster analysis techniques, the paper can effectively identify core topics, influential research directions, and key contributors within the realm of innovative security solutions and AI-driven cyber-attacks, facilitating a comprehensive understanding of the field's evolution and current state-of-the-art.

The chosen bibliometric approach is justified by its capacity to offer a comprehensive overview of research trends and influential works in cybersecurity. By integrating established tools and software, the analysis aims to provide accurate and reproducible results, laying a solid foundation for future research endeavours. The combination of bibliometric analysis and case study integration offers a robust framework for exploring the intersection of natural and applied sciences with cybersecurity, offering actionable insights for enhancing resilience in the face of dynamic threats.

To ensure internal validity, rigorous data analysis techniques will be employed to accurately identify interdisciplinary collaborations, thematic clusters, and emerging trends in cybersecurity research. This may involve using advanced clustering algorithms, network analysis, and statistical methods to uncover meaningful patterns in the data. By ensuring that the conclusions drawn are directly supported by the bibliometric data, we can enhance the robustness and reliability of the insights derived from the analysis.

Also, to ensure generalizability of findings beyond the specific context of bibliometric analysis, external validity will be addressed by contextualizing the findings within the broader research landscape of cybersecurity. By corroborating the literature review with the results of cluster analyses, we illustrate how interdisciplinary approaches to cybersecurity can contribute to addressing cybersecurity challenges.

By demonstrating the generalizability of interdisciplinary approaches through comparisons with the existing research, we can enhance the external validity of our findings and provide insights that are relevant and applicable to a broader audience of cybersecurity stakeholders.

FINDINGS

In recent years, the intersection of cybersecurity threats, artificial intelligence (AI), and natural and applied sciences has become a focal point of research due to the escalating risk posed by AI-driven cyber-attacks. This bibliometric analysis endeavours to shed light on the most influential publications in this field between 2014 and 2024, offering insights into the shared references among them and unveiling key connections within the scholarly landscape.

Co-authorship analysis

In exploring the interdisciplinary landscape of cybersecurity threats, artificial intelligence (AI), and natural and applied sciences from 2014 to 2024, a nuanced understanding emerges through the map of relatedness among co-authored documents. This bibliometric analysis sheds light on the collaborative networks and knowledge diffusion within this dynamic field, revealing intriguing patterns and significant contributions.

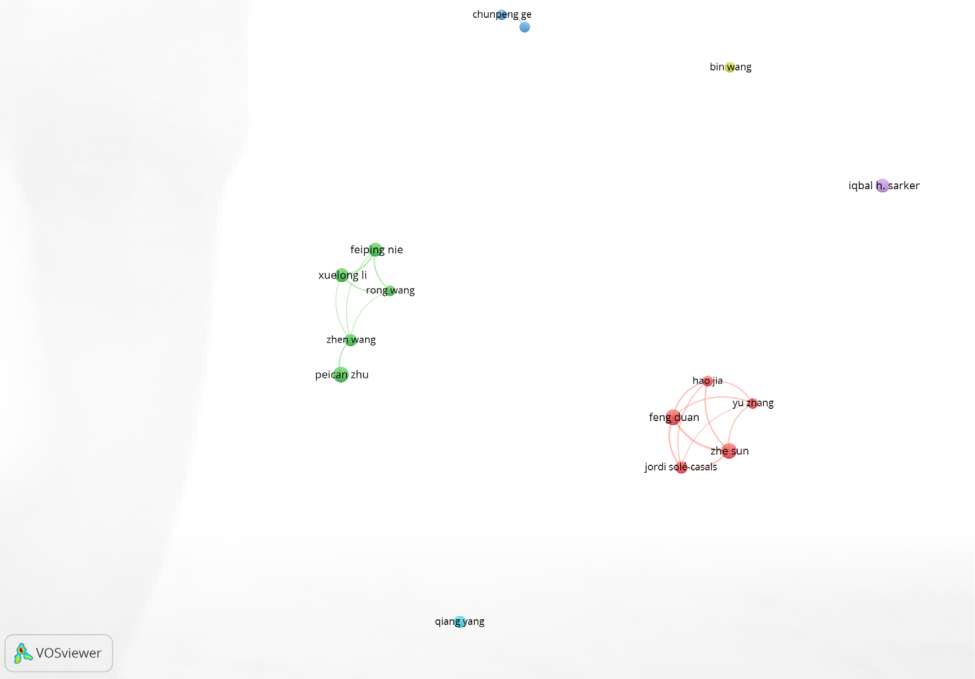


Figure 1. *Co-Authorship Map*

Co-authored documents unveil an existing tapestry of collaborative efforts in confronting the burgeoning challenges of AI-driven cyber threats. These collaborations transcend disciplinary boundaries, as evidenced by works such as "Adversarial Attacks and Defences in Deep Learning" and "The Human Factor: Understanding Behavioural Patterns in Cyber Attacks", which amalgamate insights from computer science, psychology, and sociology. Moreover, partnerships between academia and industry underscore the practical relevance of scholarly research, exemplified by "Bridging the Gap: Integrating Academic Research into Cybersecurity Practices", wherein researchers from academic institutions collaborate with cybersecurity firms to translate theoretical advancements into actionable solutions.

Furthermore, the collaborative landscape extends beyond traditional domains, as illustrated by works like "Ethical Implications of AI in Cybersecurity: A Legal Perspective" and "Economic and Policy Considerations in AI-driven Cybersecurity", which integrate ethical, legal, economic, and policy dimensions into the discourse. These partnerships not only foster innovation but also facilitate informed decision-making in navigating the complex terrain of cybersecurity. Through interdisciplinary, cross-sectoral, and cross-disciplinary collaborations, these co-authored documents exemplify a concerted effort to forge innovative pathways in safeguarding digital ecosystems against AI-driven threats.

Bibliographic coupling analysis

Through bibliometric analysis, a comprehensive map of the most frequently cited publications emerged, illuminating the interconnected web of research in the realm of cybersecurity, AI, and natural and applied sciences. This map not only showcases seminal works but also identifies clusters of related studies, thereby providing a panoramic view of the intellectual landscape.

Overlay visualization for the Bibliographic coupling map in the context of our analysis of interdisciplinary cybersecurity research provides a powerful means to identify key thematic clusters and influential authors within the field. By applying overlay colours based on citation metrics, such as citation counts or h-index, we can visually highlight the most influential authors and their contributions to the interdisciplinary literature on cybersecurity.

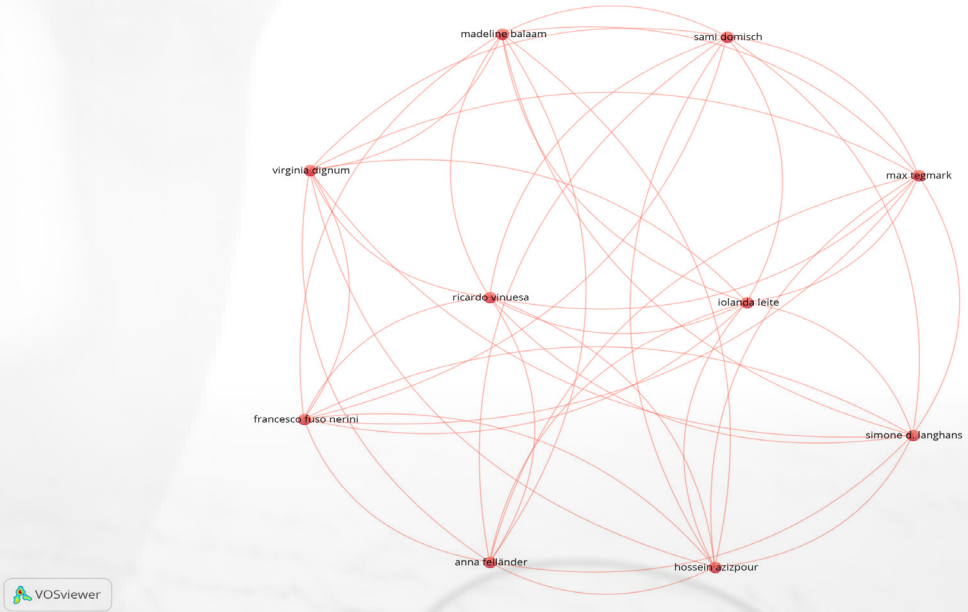


Figure 2. *Bibliographic Coupling Map – Overlay Visualization*

The table 1 presents the top 10 shared references identified in the analysis (Figure 2), along with details regarding the number of links between each of the authors, and the link strength for each link.

The results of the bibliographic coupling analysis indicate that there are nine links between each of the authors listed, with a link strength of 621 for each link. This suggests a high level of similarity in the references cited by these authors.

Table 1. *Top 10 Shared References*

Author	No. of citations	Links	Links strength
Madeline Balaam	1063	9	621
Sami Domisch	1063	9	621
Max Tegmark	1063	9	621
Simone D. Langhans	1063	9	621
Iolanda Leite	1063	9	621
Hossein Azizpour	1063	9	621
Anna Fellander	1063	9	621
Francesco Fuso Nerini	1063	9	621
Ricardo Viduesa	1063	9	621
Virginia Dignum	1063	9	621

Interpreting these results, it seems that these authors are likely working in closely related or overlapping research areas. The high number of shared citations and the strength of the links between them imply that they are drawing from a common body of literature and are likely engaged in collaborative or parallel research efforts.

The consistency in the number of citations, links, and link strength across all authors further supports the notion that they are part of the same academic community or research network, possibly contributing to shared knowledge dissemination and interdisciplinary collaboration within their field.

These shared references serve as foundational pillars in the scholarly discourse surrounding cybersecurity threats, AI, and natural and applied sciences. They not only provide a common vocabulary for researchers but also facilitate cross-disciplinary dialogue and collaboration, thereby paving the way for innovative solutions to address the evolving landscape of security challenges in the digital age.

CITATION ANALYSIS

Based on the top cited scholarly works (Table 2), it is evident that there is a significant interest in topics related to artificial intelligence (AI), deep learning, and smart manufacturing systems, among others. The publication year ranges from 2018 to 2022, indicating recent and ongoing research in these areas. Interestingly, most of the top-cited works are open access, suggesting a trend towards accessibility and dissemination of knowledge in these fields.

Furthermore, the top-cited works cover a wide range of applications and research directions, including AI in achieving sustainable development goals, smart manufacturing systems for Industry 4.0, and the ethical and regulatory issues of AI-based medical devices in radiology. This diversity reflects the interdisciplinary nature of research in AI and related fields, with implications for various sectors such as healthcare, industry, and technology.

Table 2. *Top 10 Cited Scholarly Works*

Title	Publication Year	Citing Scholarly Works
The role of artificial intelligence in achieving the sustainable development goals	2020	1063
Deep Learning: A Comprehensive Overview on Techniques, Taxonomy, Applications and Research Directions	2021	737
Smart manufacturing systems for Industry 4.0: Conceptual framework, scenarios, and future perspectives	2018	644
The Lepton Collider: Future Circular Collider Conceptual Design Report Volume 2	2019	567
The Hadron Collider	2019	398
Digital Economy as a Factor in the Technological Development of the Mineral Sector	2019	270
Artificial intelligence as a medical device in radiology: ethical and regulatory issues in Europe and the United States	2018	259
AI-Based Modeling: Techniques, Applications and Research Issues Towards Automation, Intelligent and Smart Systems	2022	219
Gut microbiome, big data and machine learning to promote precision medicine for cancer	2020	188
Deep Learning in the Construction Industry: A Review of Present Status and Future Innovations	2020	187

Co-Citation Analysis

In conducting a bibliometric analysis to explore the interconnectedness of authors within the realms of cybersecurity threats, artificial intelligence (AI), and natural and applied sciences from 2014 to 2024, several noteworthy patterns emerge. By examining the frequency of authors citing each other, we can unveil a map of relatedness, shedding light on influential figures and their contributions to the field.

Firstly, if we look at Figure 3, Iqbal H. Sarker emerges as a central figure in the network, with 11 links and a link strength of 27, indicating a significant level of citation overlap with other researchers. This suggests that Sarker's work is highly influential and frequently cited within the field, with a total of 1103 citations.

Anna Fellander also stands out with 15 links and a link strength of 15, indicating a moderate level of co-citation with other authors. Despite a slightly lower link strength compared to Sarker, Fellander's work is still highly cited, with a total of 1063 citations.

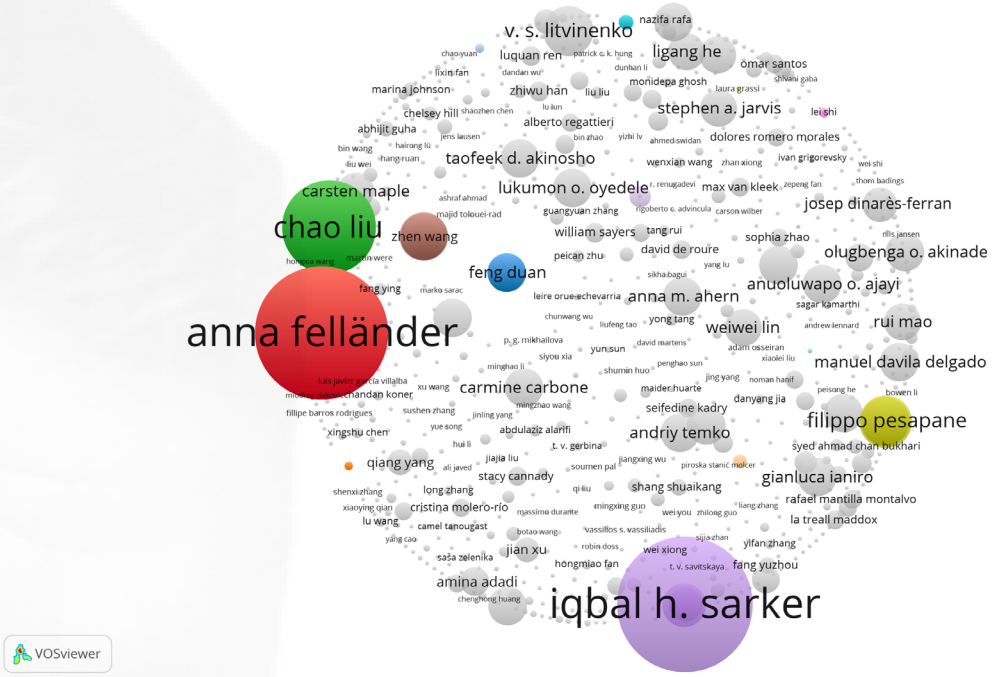


Figure 3. *Co-Citation Map*

Chao Liu, Feiping Nie, and Feng Duan exhibit lower levels of co-citation compared to Sarker and Fellander, with 5, 8, and 15 links respectively. This suggests that while their work is cited within the field, it may not be as central or influential as that of Sarker and Fellander.

Filippo Perapane falls in between, with 11 links and a link strength of 11, indicating a moderate level of co-citation and a total of 290 citations.

Overall, these findings highlight the key researchers and their respective contributions within the research domain. Sarker and Fellander emerge as central figures with significant influence, while Liu, Nie, Duan, and Perapane also contribute meaningfully to the scholarly discourse, albeit to varying degrees.

ORIGINALITY/VALUE

The originality and value of the research lie in its comprehensive analysis of interdisciplinary collaboration in addressing the emerging threat of AI-driven cyber-attacks. Drawing on findings from co-authorship analysis, the study identifies key clusters of researchers from diverse fields such as computer science, cybersecurity, behavioural science, and policy studies. For instance, the analysis reveals collaborations between computer scientists developing AI algorithms and cybersecurity experts designing defence mechanisms, indicating the convergence of technical expertise in combating cyber threats. This interdisciplinary collaboration is crucial as it fosters the development of holistic cybersecurity frameworks that consider not only technical aspects but also behavioural and policy dimensions, as evidenced by the clustering of researchers from different disciplinary backgrounds.

Moreover, bibliographic coupling and co-citation analyses uncover seminal works and influential publications that have shaped the discourse on innovative security solutions. For example, the identification of highly cited papers discussing the ethical implications of AI technologies in cybersecurity

highlights the growing awareness of ethical considerations in developing defensive strategies against AI-driven attacks.

This insight underscores the value of integrating ethical principles into cybersecurity frameworks, which is essential for ensuring responsible and sustainable solutions. Overall, the research contributes to the advancement of cybersecurity by providing a nuanced understanding of interdisciplinary collaborations and identifying key areas for future innovation.

By leveraging insights from diverse disciplines and building upon the existing knowledge, stakeholders can co-create innovative solutions that effectively mitigate the risks posed by AI-driven cyber-attacks while upholding ethical standards and addressing societal concerns.

Also, the analysis findings resonate with the literature's emphasis on the need for collaboration across diverse fields to address complex cybersecurity challenges effectively. For example, the identification of clusters of researchers from various disciplines, including computer science, cybersecurity, behavioural science, and policy studies, supports the argument made in the literature about the necessity of integrating technical, behavioural, and policy dimensions in cybersecurity frameworks.

However, there are gaps in the literature and the analysis findings that could be further explored. One notable gap is the limited attention paid to the role of international collaboration in cybersecurity research, which is crucial given the global nature of cyber threats. While the analysis may have focused on collaborations within specific regions or institutions, exploring international collaboration patterns could provide valuable insights into global trends and best practices in cybersecurity. Additionally, while the analysis highlights the importance of ethical considerations, the literature review may not have delved deeply into the specific ethical challenges posed by AI-driven cyber-attacks. Future research could address these gaps by examining international collaboration networks in cybersecurity research and conducting in-depth analyses of the ethical implications of AI technologies in cybersecurity. By filling these gaps, researchers can gain a more comprehensive understanding of interdisciplinary collaboration and ethical considerations in cybersecurity, thereby informing the development of more robust and inclusive security solutions.

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CHALLENGES AND GAPS IN BIOTERRORISM'S DETECTION AND INVESTIGATION

Cheong Ju Kim
Fanny Ewann[1]
Bioterrorism Prevention Unit, CBRNE and Vulnerable Targets Sub-Directorate
Counter Terrorism Directorate, INTERPOL, France

INTRODUCTION

Any accidental or natural release of a pathogen or toxin in a population can deeply disrupt a community or country as demonstrated by the latest COVID-19 and avian influenza epidemics or more local outbreaks such as cholera, dengue or anthrax (Madhav, 2017; Rahman et al., 2020; Samsudin et al., 2024). A similar scale event qualifying as bioterrorism would create an even greater disruption since the intentional release of the biological agent or toxin would be carried out for the purpose of harming or killing animals or plants with the intent to intimidate or coerce a government or civilian population to further political or social objectives as defined by INTERPOL in its Bioterrorism incident pre-planning and response guide (2018).

While fortunately few bioterrorism incidents are reported across the globe, those which have been successful have had deep and often lasting impact on nations and populations. With a total of 5 deaths, 17 injured, almost 8 years of investigation and around $320 million dollars spent in decontamination, the 2001 anthrax attack in the USA illustrate perfectly how an incident that had a limited number of casualties has far reaching consequences, including the psychological impact on the community. Another example is the deliberate spread of broom-witch disease in Brazilian cocoa plantations in the early 1990s. This event completely transformed the social, economic and political fabrics of the Bahia state and beyond (Trevisan, 2019). Even without going so far as spreading the agent, the investigation of bioterrorism threats monopolizes precious resources at national and sometimes international level, as happened in 2005 when the New Zealand government organized 'Operation Waiheke' in response to a letter sent to their Ministry of Agriculture and Forestry claiming the deliberate release of Foot and Mouth virus on Waiheke Island. While this incident was a hoax, its investigation and management required setting up of a coordinated incident management system, as well as an operations group supported by logistics and intelligence groups (Mackereth & Stone, 2006).

As technology, threat actors and even climate change are increasing the risk of disease emergence and re-emergence, as well as the accessibility and the opportunities to weaponize biological agents, it is crucial for nations to strengthen their ability to efficiently prevent, prepare for and respond to bioterrorism incidents. This paper explores specific challenges about detecting and examining evidence in suspected or confirmed bioterrorism events to identify gaps and discuss opportunities for LEA and the larger community to improve the detection and investigation of bioterrorism events. It does not specifically address aspects relating to biosecurity measures, incident response and prosecution.

1 F.ewann@interpol.int

METHODS (DESIGN/METHODS/APPROACH)

This desk-based study is based on current literature and INTERPOL's experience working with its membership in the area of bioterrorism prevention, preparedness and response. Google scholar (219,229,812 papers as of 24 June, 2024) and PubMed databases (over 37 million bibliographical references as of 24 June, 2024) were searched using the following keywords: Bioterrorism, Biothreat, Biocrime, Agrocrime, and Agroterrorism in combination with "crime scene management" or "microbial forensics" for papers published in the past 25 years.

DISCUSSION (FINDINGS)

Challenges of Bioterrorism Detection

Early detection of bioterrorism is key to mitigating its impact through the establishment of timely measures aimed at reducing the effectiveness of such an attack, avoiding subsequent attacks and averting the potentially catastrophic nature of mass pathogen release (Shea & Lister 2003). Detection is the unspecific demonstration of increased concentration of microorganisms in a particular environment, whereas identification is the species determination of the detected microorganism (Parida, Dash & Shukla, 2020). Unlike other forms of terrorism, several factors inherent to the nature of biological substances – including the sensitivity, specificity and technology needed to detect such a diversity of substances present in minute quantities among the regular background – make the detection of bioterrorism more difficult. As harmful biological substances are naturally present in the environment, independently from any human activities, and since natural outbreaks occur every day in every part of the world, detection of a bioterrorism incident consists foremost in identifying unusual disease events.

The intentional release of a biological agent can constitute either a covert or an overt attack. Overt attacks are easier to detect since by definition they are recognizable by law enforcement or other responders, either through a threat, warning or intelligence, the discovery of a means of dispersal or other signature activity/apparatus, or the discovery of questionable or suspect materials (Bioterrorism incident pre-planning and response guide, 2018). Except in some exceptional cases where the affected people are presenting acute and clear symptoms, biological agents or toxins would not cause immediate harm and their impact would only be visible after an incubation period (Pohanka, 2019). The clinical manifestations and epidemiological pattern of the disease would differ according to the characteristics of the agent(s) or toxin(s) used in the attack, its mode of dispersal, the affected population and other environmental conditions. To make things more difficult, the early signs and symptoms of a disease are often non-specific and could be mistaken for other endemic diseases or ongoing outbreaks. Strong epidemiological surveillance is therefore needed to detect unusual epidemiological patterns or disease presentations in human, animal and plant populations (Bower et al., 2022).

Biological agents and toxins agents are more easily available to nefarious actors who would not hesitate to use them. During the Covid-19 pandemic, for example, violent extremist groups were calling for the SARS-CoV-2 virus to be deliberately spread and to infect religious or ethnic groups particularly deemed adverse (Salman & Gill, 2020). Biological agents and toxins are more present in nature for multiple reasons such as the emergence of pathogens, climate change, human activities impacting the environment and human-animal interactions. In addition, the development of technology has accelerated the identification of new agents or traits that could be used in bioterrorism. In addition, technology advances are creating ways to engineer simpler, cheaper or more efficient processes or

new pathogen traits or toxins, thus posing biosecurity threats worldwide as described for peptide and protein toxins synthesis (Lee et al., 2022) or CRISPR-Cas9 (Stasi & Thongpravati, 2024; Kosal, 2020).

The democratization of knowledge of biotechnology and life science through the development of knowledge-sharing online tools and platforms has been accompanied by the simplification of processes and tools. Insufficient regulations or monitoring of these tools and platforms provide opportunities for threat actors to develop, acquire and misuse biological agents. This also means that the resources to plan a bioterrorist attack no longer require highly elaborated laboratory facilities, sophisticated technical expertise or extensive financial resources. Technology platforms such as DIYbiosphere could provide opportunities for malicious actors to develop new bioterrorism agents, production, dispersal or concealment methods (Harvin, 2024).

Another challenge of bioterrorism detection is the overall lack of awareness of indicators of bioterrorism-related activities, starting with the first responder communities, including law enforcement and fire/rescue responders. This pertains to the lack of systematic training on these particular indicators which can be traced to the following: 1) chemical and radiological terrorisms have been seen as being much more likely than bioterrorism; 2) covert biological incidents are more likely to be detected by health services than by first responders; 3) detection of bioterrorism requires specific awareness in the absence of suitable equipment.

While many countries have established dedicated Chemical, Biological, Radiological and Nuclear (CBRN) units, most are mainly focusing on the prevention of, detection of and response to biological incidents of natural or accidental origin and/or eventually CBRN warfare. This means that their first responders' awareness to bioterrorism indicators is limited as well. Limited awareness of indicators of deliberate release of biological agents or toxins is not restricted to first responders and specialized units. This is true for human health, veterinary and plant protection professionals. Since many disease presentations share initial signs and symptoms, health professionals, with reason, are trained to look for common illnesses before thinking of 'exotic' ones, thus potentially delaying the detection of these diseases that are indicative of a deliberate introduction.

The lack of awareness at national level can be explained by the recent recognition of the issue by international instances governing health services. For example, the fifty-fifth World Health Assembly in 2002 proposed to develop international guidance and technical information to deal with deliberate use of biological agents, but the first training material was distributed in 2022 (*https://apps.who.int/gb/ebwha/pdf_files/WHA55/ewha5516.pdf*; *https://openwho.org/channels/cbde*). In the veterinary space, the World Organisation for Animal Health (WOAH) established its biological threat reduction strategy in 2015 and their first guidelines on biological threat indicators were published in 2018 (*https://www.woah.org/en/document/en_final_biothreat_reduction_strategy_oct2015/*; *https://rr-africa.woah.org/app/uploads/2024/10/SUSPIC3.pdf*). As far as plant health is concerned, despite a position paper published in 2007 by the European and Mediterranean Plant Protection Organization, there is currently no international guidance endorsed in that regard (*https://www.eppo.int/RESOURCES/position_papers/council_bioterrorism*; *https://www.ippc.int/en/about/core-activities/capacity-development/guides-and-training-materials/).*

Many of these health services may not be able to distinguish the early signs of a bioterrorist event from natural and accidental contamination or infection because in most instances one must look beyond symptoms to identify intentionality (Perlin, 2008) or detect unusual epidemiological patterns through the analysis of health database or specific criteria. But once identified, whom to report them to and how to do so? In many countries, there is no established operational process in the health sector to report suspected bioterrorism or deliberate biological incidents to trigger an early multi-agency investigation.

An essential part of detection of bioterrorism falls onto the intelligence community to try to detect incidents before an attack unfolds or to prevent recurrence. This aspect of detection requires a good understanding of the global bioterrorism threat landscapes, whether in terms of threat actors, capabilities, motivation or possible targets. Monitoring these various aspects and understanding their possible presentation in the context of the constant evolution of biotechnology, science and emerging diseases require specialized expertise and input that is not always available to national intelligence teams.

As illustrated for example in the analysis of the June 2018 Cologne Ricin Plot (Flade, 2018), bioterrorism is likely to involve transnational components. Therefore, cross-border intelligence sharing should also form an essential part of bioterrorism detection. This implies the development of established cooperation channels and partnerships, as well as a dedicated international database consolidating relevant information on all development stages of attacks across the world to provide the most accurate picture and information to countries worldwide. So far, most of the efforts have been geared up towards gathering epidemiological intelligence through various sources and less towards building the analysis necessary to detect unusual events that would be indicative of biological attacks or weapons development.

As described above, multiple actors are involved in various aspects of monitoring and data collection regarding different aspects of bioterrorism incident. But in many countries, those various stakeholders have no dedicated information system to store and structure this information in a useable way. Often there is no defined criteria, clear reporting mechanisms or guidelines for information sharing or outreach whether at national level or across border outside of the partnerships established with international organisations.

Current Status of Bioterrorism Detection

Bioterrorism detection combines bioterrorism activity monitoring, carried out by the security sector, and biological incident surveillance which is mostly under the responsibility of the health sector (Wenger, P. N., Halperin, W., & Ziga, E., 2008). Biological incident surveillance can be conducted in a passive or an active manner and both have their pros and cons in terms of cost/benefit perception, but in both cases it is based on a set of indicators or criteria (Wenger et al., 2008). The development of event-based surveillance is a major step for bioterrorism detection as it is meant to complement the classic indicator-based surveillance systems to: 1) detect rare and new events that are not specifically included in indicator-based surveillance or 2) quickly capture information about events that are a potential risk to health in a non-traditional approach to early warning applicable across human, animal and environmental health (Crawley et al., 2024), both specificities being expected in a covert bioterrorist attack. The application of AI-based technology for multi-dimensional open-source public health surveillance data analysis is opening the door to increased bioterrorism detection through the identification of variations in local and regional disease pattern, in modelled outbreak behaviour, or the detection of specific misinformation and disinformation patterns (MacIntyre, et al., 2023).

In any case, biological incident surveillance relies either on the detection of signs and symptoms in a human, animal or plan population, or on the detection of biological agents and toxins in the environment. The latter can be performed on a permanent basis at pre-identified detection points, such as critical infrastructures, major public events, high level visits or hubs (e.g. sewage systems, airports, mail sorting facilities, etc.), where an operator collects samples from contaminated environment or real-time stand-off detection. Stand-off detection has the advantage of minimizing the operator and equipment exposure to contamination (Coluccelli et al., 2023), but that solution is still largely in the research and development stage in the biological field. The continuous detection or monitoring of biological agents requires arrays of different sensors to cover multiple biological agents because most

detection schemes are specific for a particular biological agent (Parida et al., 2020). This implies the dedication of financial, technical and human resources that are not readily available to many countries.

When a CBRN attack has occurred in a location where no permanent detection is in place, field detection can be deployed. However, where some radiological and chemical substances can be detected in real-time with specific equipment such as Geiger counters and Fourier Transform Infrared (FITR) or Raman spectroscopy devices, there is no field detection equipment that can provide an instant read of the potential presence of a dangerous biological agent (Kaszeta, 2023). Biological detection in the field still relies fully on the collection and preparation of an appropriate sample that will then be applied, most likely to a lateral flow assay or taken for molecular analysis (PCR or RT-PCR) to a laboratory, method that will take at least 15 minutes to process. Most lateral flow assays can process a very low number of agents at once (usually 1-5) requiring repetition of the operation and spending material that can be present in minute quantity already for a result that may not provide any indication and will have in any case to be confirmed in a laboratory. Moreover, presumptive testing results will have direct consequences on operational decisions (such as zoning, public order disruption, communication, etc.) that could in turn require the deployment of unnecessary resources and raise unwarranted alarm should the test turn out to be a false positive.

Table 1. *Differences Between Field Detection and Lab Identification*

	Field detection	**Laboratory identification**
Methods	Immunoassays (usually lateral flow)	Immunology Molecular biology Microbiology/Microscopy Spectrometry Chromatography Biochemistry/Enzymology
Characteristics	Presumptive Fast information On the spot Relatively limited equipment required Potentially contaminated environment Non-optimized procedures Limited methods available Limited to some agents and toxins	Confirmatory Time-consuming (sample preparation, etc.) Sophisticated equipment Controlled/safe environment Standardized/optimized procedures Many methods available Different laboratories for different agents and toxins or expertise

Whether considering environmental or field detection, these detection systems need to exhibit high sensitivity because biological agents and toxins are effective in very low quantities and the environmental background is complex and rapidly changing (Fatah, et al. 2001). The technology also needs to ensure rapidity, reliability, and specificity so as to quickly narrow down the correct etiological agent from other similar substances (Lim, Simpson, Kearns, & Kramer, 2005). In the late 1990s, most of the Research and development on detection of biological weapons involved nucleic acid or antibody-based probes combined with optical, most often fluorescence, transduction, or it involved adapting separation-based technology like mass spectrometry (Institute of Medicine (US) Committee on R&D Needs for Improving Civilian Medical Response to Chemical and Biological Terrorism Incidents, 1999). Since then, the same technologies have been further developed with the introduction of new materials, such

as nanoparticles or quantum dots, of new techniques or methods to develop or improve biosensors and bioassays for biological agents and toxins detection. (Duriez, Armengaud, Fenaille & Ezan, 2016; Pohanka, 2019; Pohanka, 2023). However, to date, the number of agents detected, their availability for multiplex detection and their sensitivity remain limited for field detection (Kaszeta, 2023).

Challenges in Collection and Examination of Bio-Contaminated Evidence

Some countries have built strong approaches to detect and examine bio-contaminated evidence (Budowle, 2003). Given the resources and expertise needed to investigate such complex events, these approaches usually involve strong partnerships and coordination between agencies. However, many countries are still looking for guidance in that domain and the scientific literature on the topic of biological crime scene management remains scarce. Indeed, most of the recent literature on bioterrorism and forensics focuses on microbial forensics (Table 1), but provides little information on biological crime scene management and processing.

Table 2. *Number of Entries in Literature in the Past 25 Years Addressing Crime Scene Management and Microbial Forensics in the Field of Biological Threats*

Keywords	**Number of papers retrieved (crime scene management/microbial forensics)**	
	PubMed	**Google Scholar**
Bioterrorism	191 (0/50)	53,900* (52/1,130*)
Biothreat	683 (0/3)	11,100* (2/309)
Biocrime	6,613 (0/48)	2,020* (3/444)
Agrocrime	3 (0/0)	59 (0/3)
Agroterrorism	43 (0/1)	3100* (12/81)

*approximate numbers

While in many countries the legal basis for interagency coordination and cooperation is well established for disaster management, it rarely covers the investigation aspects linked to the accidental or deliberate release of biological agents, even under terrorism or CBRN misuse (DeVries, 2023). In absence of legal texts, the investigation of such incidents relies mostly on subpoenas allowing law enforcement to enrol the support of external expertise. However, these *ad hoc* solutions do not account for the degree of intricacy involved in the investigation of an incident involving the release of a harmful biological substance, as described in the lessons learnt from the 2001 Anthrax attacks in the USA (Butler 2002). Indeed, once a suspicious biological incident occurs, the criminal investigation requires new roles and responsibilities to be undertaken in addition to the regular incident response. This often leads to shifts in the incident command structure and additional coordination with more specialized units or services that varies also depending on the type of incident and the step of the investigation process. In absence of proper understanding of each other roles and constraints, coordination issues may arise that can jeopardize biological incident investigations, as well as compromise safety and security of the responders and the public.

Unlike for conventional scenes, several steps will take place to ensure the safety of the responders and mitigate the risk of accidental spread of the biological material into the population and the environment when processing a contaminated crime scene (Figure 1). Most of these steps though will require

the support from other agencies, often with no law enforcement mandate or background. Ensuring that all responders involved in these different steps can perform their task safely in a manner that allows crime scene preservation and operations is challenging in itself (Zuidberg, van Woerkom, de Bruin, Stoel, & de Puit, 2014).

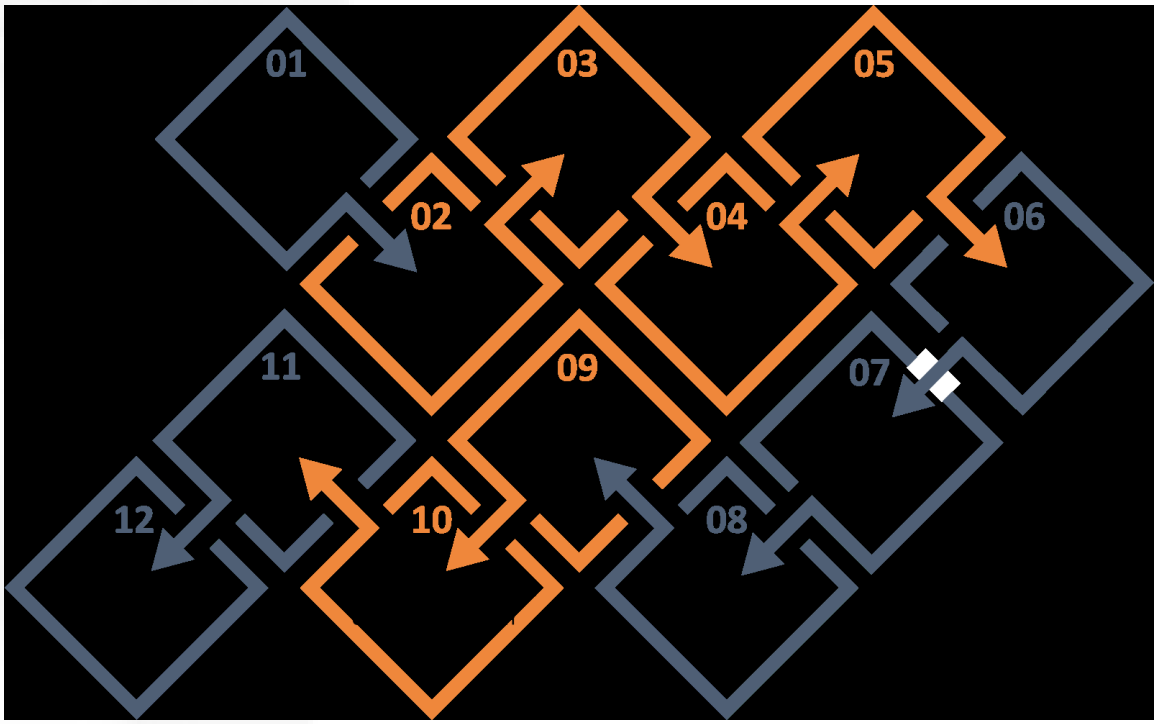


Figure 1. *Additional Steps Required to Safely Manage a Crime Scene Contaminated with Biological Materials Compared to a Conventional Crime Scene (Blue)*

Even before law enforcement officers can perform the scene reconnaissance, deployment of specific support units that will set up decontamination corridors and use specific detection equipment in a contaminated environment to carry out the CBRN hazard assessment can delay crime scene operations for a while and thus compromise some of the evidence. Technical challenges, such as logistics, equipment and carrying operations in a biological contaminated environment, also add to this coordination issues.

Integrity and preservation of evidence can be especially challenging in a biological incident as there could be many agencies involved within the incident scene (e.g. fire fighters, paramedics, military, CBRN teams, police, and environmental services) before it can be processed as a crime scene. For example, in many countries the CBRN hazard assessment is carried by firefighter or military units. While supporting the elaboration of a risk management strategy, the essential step of CBRN hazard assessment will determine which personal protective equipment (PPE) the investigative and supporting teams will be wearing to access the crime scene. This in turn will deeply impact the working conditions and forensics strategy to be applied on the scene (in the so-called hot zone).

Even without air supply limitations, the stress generated by the investigation of a high-profile bioterrorism event, the mental strain created by the work in a contaminated environment and the physical impact of operating in a PPE are limiting the time any team can spend in the hot zone. This will have to be considered, together with the information collected by the reconnaissance team and the available human and material resources for processing the scene, when establishing the forensics strategy.

Each forensic strategy will be unique as each scene is, but also because each country has a defined set of resources and capabilities for handling it. Applying the guiding principles of prioritisation of evidence to be collected will also be influenced by the capabilities of evidence examination both on-site and off-site. Considering the biological agent present on the scene and the effect of diverse types of decontaminants on materials and traces that would need to be exploited (Zuidberg, 2014), evidence decontamination may not be feasible and contaminated evidence will have to be examined.

While it is very tempting to process the maximum pieces of evidence in the hot zone to avoid taking the contamination elsewhere, several elements must be considered: operational context, quality of the work carried out in a non-controlled environment, equipment to be brought into the hot zone (and its fate or decontamination), as well as the feasibility of the examination. Another approach would be to carry out a maximum of the examination in a mobile laboratory equipped to handle biologically contaminated evidence. However, mobile labs also have their own limitation (size, equipment, technology available, decontamination protocols, etc.). Thus, the forensics strategy will have to balance those various constraints, as well as those of the specialized facilities where the necessary analyses can be carried out for the biological samples (Schmedes & Budowle, 2019) and for traditional evidence contaminated by a biological agent (Kaszeta, 2018). Once the strategy is established, forensics personnel trained in working in contaminated environment can enter the scene to process it, but several questions will need to be answered to properly collect, segregate and transport evidence. The first one pertains to the type of evidence and the analyses that can be carried out on-site. The type of evidence will determine: 1) whether traditional or microbial forensics have to be undertaken, 2) whether it can be decontaminated without damaging key elements (traces, digital information, etc.), 3) what analyses can be performed and under which conditions. These in turn will condition the fate of this evidence, as displayed in the simplified decision-making tree (Figure 2).

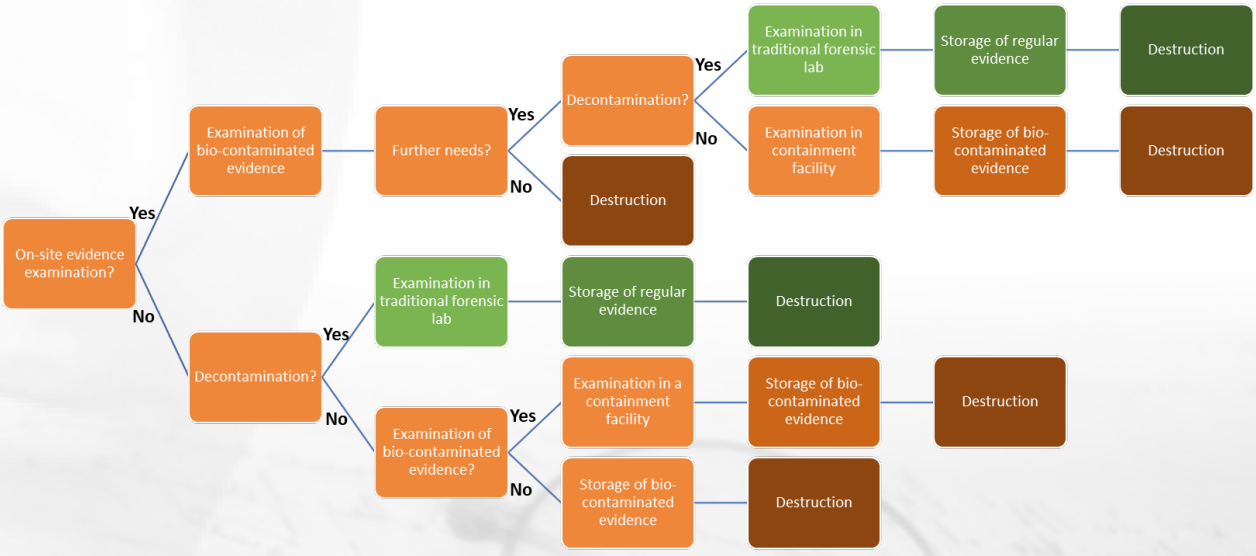


Figure 2. *Decision-Making Tree for Evidence Examination Depending on Technical Feasibility and Contamination Status (Orange: Bio-Contaminated Evidence, Green: Decontaminated Evidence)*

The identification of the biological agent or toxin involved in the attack is essential to establish proper countermeasures and mitigate the impact of the incident. However, in addition to ensuring the safety of the populations and the environment, additional analysis of the biological agent samples will be required to link the perpetrator to the attack and ascertain the deliberate nature of the incident. Microbial forensics is the scientific discipline dedicated to analyzing evidence from a deliberate release

for attribution purposes. It combines the practices of epidemiology with the characterization of microbial and microbial-related evidence to assist in determining the specific source of the sample, as individualizing as possible, and/or the methods, means, processes and locations involved to determine the identity of the perpetrator(s) of an attack (Schmedes & Budowle, 2019). As highlighted in Table 2, such a complex discipline requires the use of various technology and disciplines that are not necessarily used or available in routine high containment or forensic laboratories. Therefore, elements that need to be considered when packaging biological samples is the destination of each sample evidence and acceptance criteria (or constraints) of the facility that will receive these pieces of evidence.

Table 3. *Technologies and Disciplines Involved in Microbiological Forensics*

Technologies	**Disciplines**
Advanced microscopy	Bacteriology
Chromatography	Biochemistry
Evolving, nascent technologies	Bioinformatics
Flow-cytometry	Genomics
High-throughput sequencing	Metabolomics
Hyperspectral imaging	Molecular Biology
Identification of indicators of engineering	Mycology
Mass spectrometry	Phytopathology
Metagenomics	Population genetics
Non-biologic tools (e.g. nanotechnologies)	Proteomics
Sensitive signature detection and characterization	Statistical analysis and confidence estimations
Synthetic biology	Virology

As discussed above, the processing of traditional evidence contaminated by a biological agent will first depend on whether they need to or can be decontaminated and what decontamination protocol can be applied. The effects of decontamination agents should be considered to avoid any damage to physical evidence, such as DNA and latent prints (Wilkinson et al, 2020). If proper resources and protocols are available, some evidence can be processed without decontamination, for example for some fingerprints or digital devices. For evidence that can be decontaminated, the application of specific decontamination protocols would be required to ensure the safety of the personnel performing regular forensics examination. As for the evidence that cannot be decontaminated, their examination will depend on the facilities where they are to be handled and process, the equipment and technologies that will be available in this high-containment areas, as well as the feasibility of the examination protocols.

Another aspect that should not be neglected is the question of accessing and manipulating in high-containment laboratories. Because of their inherent constraints and operations, some of these facilities would be unable to accept emergency work from an external entity to be carried out on their premises. In addition to their capacity to host certain types of biological agents, all these facilities have strict access and training requirements for personal allowed inside (Joseph, 2021). These safety requirements would supersede operational powers granted to law enforcement, for example through subpoenas. Bio-containment facilities operating procedures could also limit to some extent the possibility to store safely and securely any bio-contaminated evidence.

Concerning manipulations in high-containment facilities, while forensic science technicians are qualified to perform traditional forensics, they do not usually develop skills to perform their tasks in a high-containment laboratories. Conversely, laboratory technicians who are routinely operating in high-containment laboratories are perfectly versed in the inner running of such facilities. However, they are usually not trained in traditional forensics techniques. Working in a facility that was not meant to undertake traditional forensics in many cases will require to adapt forensics procedures to constraints specific to the high-containment facility. In addition to answering the who and how will the work be carried out in a non-forensic, high-containment laboratory, it is important to define how chain of custody and secured evidence storage will be maintained in these facilities.

Good Practices in the Collection and Examination of Bio-Contaminated Evidence

Interagency preparedness and cooperation require to first properly identify the resources and partnership needed to carry out safely and efficiently criminal investigation of biological incidents, from detection to prosecution. This will allow to ensure that the necessary conventions and agreements (or memorandum of understanding) are in place to facilitate joint activities and provide a framework for efficient cooperation between all the agencies involved. Often overlooked, magistrates in charge of the prosecution of such crimes should be fully aware of the processes and constraints to better anticipate the difficulties and limitations linked to this kind of investigation (*https://unicri.it/Publication/Prosecutor-Guide-Chemical-Biological-Crimes*).

Having the properly trained personnel and deploying the necessary resources to respond to a bioterrorism crime scene requires a thorough mapping of human, financial, equipment and facilities available at national level, as well as the identification of partners within and outside the countries that can support law enforcement crime scene processing in each of its phases. All these partners should have some level of awareness of the biological threats and be involved in joint planning and preparedness activities for biological incident investigation.

Once a cooperation framework and joint planning has been established, it becomes easier to elaborate joint Standard Operating Procedures (SOPs) and undertake joint training and exercises. These joint activities are essential in building trust and understanding between agencies that usually have different constraints, operating framework and intervention goals. But they also contribute to rehearse procedures and hone skills and mechanisms that are not frequently used, as well as to test and improve plans and procedures for various scenarios (Reutter et al., 2010). Those interagency simulation exercises can be small or large in scale but should always be carefully planned to maximize their benefits (*https://www.woah.org/app/uploads/2021/03/simulation-exercises-veng-revised-1st-edition.pdf*). They can also be used to maintain laboratory proficiency both for sample processing and results reporting (Worbs et al., 2015).

Having access to scientific reachback capable of understanding and advising on both safety and sampling is invaluable in the processing of a bio-contaminated crime scene. Scientific advisors should be as diverse as the biological field is to cover human, animal and plant pathogens, as well as toxins. They should have a good understanding of the responsibilities and needs of forensics specialists to best guide them on the type and quantity of samples to be collected. Reaching back to the laboratories that will be conducting microbial forensics can also contribute to providing the best samples and preserve them for optimal analyses.

Given the diversity in biological agents and toxins and technologies needed in microbial forensics, as well as the constraints linked to undertaking traditional forensics in high-containment environment,

it is essential to develop laboratory networks that can be mobilised for the prompt examination of bio-contaminated evidence. Some of these laboratories would likely also be involved in the detection of bioterrorism events (Villanueva, Schweitzer, Odle & Aden, 2019). The development of a laboratory network, such as the US Laboratory Response Network for biological threats (Villanueva, et al., 2019) or the French Biotox-Piratox, offers opportunities to ensure flexibility and optimum use of national analytical capabilities (Thibault, Forcet, Lachenaud & Vidal, 2009). However, the network itself cannot be limited to the mapping of national capabilities: it must also provide the use of standardized reagents, standard-driven protocols, and training, including proficiency testing. Where national capacities are lacking, they can be compensated through regional or international networks or agreements (Nisii et al., 2009).

Existing Support from International Partners

Several international entities are providing global support to their membership about bioterrorism detection and/or evidence collection and examination. Support in this area includes information exchange on suspicious activities or events, as well as capacity building and incident support.

In the area of information exchange regarding suspicious biological incidents and bioterrorism prevention, several international bodies have developed intelligence sharing platforms to give opportunities to countries to provide and receive information. For example, from the animal health perspective, WOAH has developed the World Animal Health Information System (WAHIS) and WAHIS-Wild to track emerging and re-emerging domestic and wild animals on the basis of information confirmed by veterinary authorities (Fanelli et al., 2022). On the other end of the spectrum of the human-animal interface, the World Health Organization (WHO) runs the Epidemic Intelligence from Open Sources (EIOS) system to detect unusual or unexpected signals at various geographic levels (Togami et al., 2022). In the security arena, building from its outreach and work with its 196 countries, INTERPOL – with the support of its partners – is strengthening the global monitoring and detection of bioterrorism incidents through the development of BioTracker (*https://www.interpol.int/Crimes/Terrorism/Bioterrorism/Police-Data-Management-and-Analysis-Bioterrorism/ProjectSheet_BIOTRACKER_EN_JUNE2023.pdf*). It supports INTERPOL member countries through a data-sharing platform focusing on biological threats and incidents which includes an early warning component.

Beyond information collection and sharing, international organizations have been developing resources in support to national authorities to strengthen early detection of bioterrorist events and safe processing of bio-contaminated evidence. In the area of disease surveillance, for example, WHO and WOAH have long developed guidelines and tools, including listed diseases (*https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmfile=chapitre_oie_listed_disease.htm*, *https://www.woah.org/en/what-we-do/standards/codes-and-manuals/aquatic-code-online-access/?id=169&L=1&htmfile=chapitre_diseases_listed.htm*) or priority pathogens (Jesudason, 2024), for early warning of disease outbreak. In the past years, they have expanded the scope of some of these resources to include deliberate release of biological agents and toxins, as exemplified by WOAH's development of a biological threat reduction programme in 2015 (https://www.woah.org/en/document/en_final_biothreat_reduction_strategy_oct2015/) or WHO launching in 2022 a massive open online course on "Chemical and Biological Deliberate Event" for health professionals (*https://openwho.org/channels/cbde*).

The same applies to intergovernmental agencies in the security arenas. In 2023, the Organization for the Prohibition of Chemical Weapons (OPCW) has a result of its biotoxins analysis process and has reviewed and expended its list of priority toxins, which now includes both low molecular and high

molecular weight toxins (*https://www.opcw.org/documents/2023/04/sabrep123/analysis-biotoxins-report-scientific-advisory-boards-temporary-working*). The subsequent report highlights the importance for field detection and the potential value of strengthening early clinical diagnosis of biotoxin exposure and the need to determine whether exposure is due to deliberate use, rather than natural exposure. In 2024, INTERPOL has undertaken a full review of its list of biological agents and toxins of concerns for animal and human populations to ensure it remains relevant for the global law enforcement communities. This list, which is made available to the law enforcement community, can support the development of national and regional strategies to prevent, prepare for and respond to bioterrorism incidents targeting human and animal populations.

Several of the aforementioned intergovernmental organizations have also developed tools or frameworks to assess different aspects at the interface of bioterrorism surveillance and investigations. For example, some of the indicators of the WHO Joint External Evaluation or the WOAH Performance of Veterinary Services Pathway can identify capabilities and gaps related to public health and veterinary surveillance and epidemiological surveillance (Babigumira et al., 2023). Conversely, the Biothreat Detection Module of FAO's Surveillance Evaluation Tool was co-developed with WOAH and INTERPOL with the specific purpose to help countries assess their capacities to detect agroterrorism and agrocrime (Vasconcelos et al., 2021). With the launch in 2023 of its Global Biosecurity Enhancement Programme for Law Enforcement, INTERPOL developed, with the support of a group of expert, its Biosecurity Country Needs and Capability Assessment Framework (*https://www.interpol.int/content/download/21008/file/23COM003018-01%20CBRNE_BioT_Global%20Biosecurity_Porject%20sheet_2023-09_EN%2005%20HR%20%281%29.pdf*). This framework focuses on the interagency capacities, resources and partnerships needed, from a law enforcement perspective, to efficiently prevent, prepare and respond to suspected deliberate biological incidents, including the detection and investigation of bioterrorism.

INTERPOL is also contributing to the establishment of safer and more robust approaches for the investigation and processing of bio-contaminated evidence at national, regional and international levels. This is mostly done through capacity building activities undertaken with the support of national experts and organized as part of national training or co-organized with other intergovernmental organizations such as the WOAH, the United Nations Office for Counter Terrorism or the United Nations Office for Disarmament Affairs (*https://www.interpol.int/Crimes/Terrorism/Bioterrorism/BioTerrorism-Expertise*). While the mandate of some of those partner entities focuses on the investigation into the alleged use of biological agents and toxins by state actors (e.g. the United Nation Secretary-General's Mechanism for the investigation of alleged use of biological and chemical weapons or the OPCW), their work contributes to strengthen national expertise and international networks required to investigate bioterrorism.

In addition to strengthening prevention, detection of and preparedness for bioterrorism attacks, some of the international organization aforementioned, as well as regional organizations, also offer support to their membership in response to the deliberate release of a biological agent or toxin (Babigumira et al., 2023). For example, while WHO does not have a mandate to lead nor to participate in investigations in response to a potential deliberate event, they may collaborate with and support other entities and mechanisms, or deploy staff and resources to affected countries through their Global Outbreak Alert and Response Network (*https://goarn.who.int/*). WOAH and the Food and Agriculture Agency of the United Nations (FAO) would play a similar role should animal and/or plant health be targeted (*https://www.woah.org/en/what-we-offer/emergency-preparedness/interagency-cooperation-for-emergency-management/*; *https://www.fao.org/animal-health/our-programmes/emergency-management-centre-(emc)/en*).

Potential Solutions and Recommendations

International conventions do not require states to have legislation criminalizing the deliberate dissemination of biological agents against human, animal and plant populations. For many states, this is covered by some more general legislation without addressing the specificities of biological agents dispersal. Therefore, national legislation should be updated to provide better protection and prosecution of such acts (DeVries, 2023). In parallel, national law enforcement agencies need to ensure the proper level of awareness of their officials about the existing legal frameworks relative to biosecurity and the misuse of biological agents in their country.

To efficiently support cooperation between law enforcement and other relevant agencies, such as human, animal, plant and health agencies and regulatory authorities, interagency agreements should be formalized and provide a framework for the sharing of bioterrorism and biocrime information at national level. These agreements should also make provision for the early and sustained involvement of all relevant stakeholders to interagency prevention, preparedness and response activity in the area of bioterrorism, and include clear triggers and indicators for action and investigation with clearly defined roles and responsibilities as part of a 'One Health' approach to deliberate biological incidents.

Bioterrorism detection could be strengthened through awareness raising and training on triggers and indicators of bioterrorism in all stakeholders. However, this would have to be supported by the establishment of systems defining clear criteria and processes for the reporting of deliberate or suspicious events. In this regard, the development of additional guidance and resources from international organizations would be beneficial, particularly in plant health.

Existing resources developed by regional and international partners for generic purposes or for the very purpose of identifying gaps in prevention, preparedness and/or response to deliberate biological events are a good starting point to identify priority area for improvement (Babigumira et al., 2023). Similarly, priority biological agents and/or toxins lists from international organizations can support the prioritization of surveillance efforts at national level based on a clearly defined purpose and the application of strong and fit for purpose criteria (Pillai et al., 2023).

Both environmental and field detection are still quite limited compared to other CBRN substances. Considering the development of detection technology significantly depends on industry and academia, public-private partnerships should be considered to speed up innovation in this area in particular for rapid, sensitive, specific and cheaper field detection.

Intelligence units' expertise and tools should be strengthened to expand the scope of intelligence collection for a comprehensive analytical approach. Promoting international information sharing, including through INTERPOL BioTracker, represents a unique opportunity for member countries to contribute to the detection and early warning of biological incidents through an integrated intelligence collection and analysis, and thus provide a better understanding of the global bioterrorism threat landscape. Intelligence sharing between relevant international organizations should be promoted and facilitated through formalized cooperation agreements. The preparedness phase is essential for the establishment of interagency agreements for the safe biological crime scene management and forensic planning. These agreements should foster interagency cooperation, joint planning, joint SOPs, joint training and joint exercising (Green, M. S., LeDuc, J., Cohen, D., & Franz, D. R., 2019). They should also cater for the establishment of a comprehensive network of laboratories for evidence examination (microbial and traditional forensics in a 'One Health' perspective).

More guidance, research and resources should be developed on biological crime scene management, as well as safe and efficient examination of bio-contaminated evidence. Experience sharing in that area through various fora would be beneficial for forensics team developing expertise or looking for solutions to specific issues in the examination of traditional evidence contaminated by different types of biological agents or toxins.

CONCLUSION (ORIGINALITY/VALUE)

While some scientific literature exists on bioterrorism forensics, recent studies mostly focus on microbial forensics. This paper focuses on the institutional limitations and gaps in the detection of bioterrorism incidents, measures for the safe and efficient processing of the evidence collected in such investigations, as well as discussing opportunities to address those gaps.

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ENVIRONMENTAL DNA – eDNA

Minja Blažić Pavićević, PhD[1]
Law Office Blažić, Belgrade, Serbia

INITIAL CONSIDERATIONS

Human right to a healthy and preserved environment in modern legislature is elevated to a level of right that is guaranteed both by the law and constitution. Although we may defend a point that it is a right which is a prerequisite for the survival of today's generations, as well as the future ones, we cannot ignore the impression that exercise as well as practice of such right is being neglected, mostly because it is taken for granted, since the profession fails to seek the importance of legislature and legal control of the right to a healthy environment. The right to a healthy environment has been facing modern challenges in recent decades, which leads to the conclusion that the absence of individual consciousness has made the necessity of including criminal law in the environmental protection system. Such criminal law pertaining to the environmental protection system can be seen as a formal social control, which states are seeking to reduce the level of environmental crime (Ignjatović, 2023: 49). In addition to the above, protection via criminal law norms must be seen as the ultimate mechanism of protection, mechanism that is to be used solely in the most drastic situations, where such criminal act is a result of a person's doing (Vuković, 2021: 74).

The main goal of criminal law is a purpose of protection, which is realized though the regulation of certain acts and doings as criminal acts, and the regulation of proper sanctions for such wrongful doings, as well as the realization of the conditions of the application of the sanctions to the perpetrator of the crime (Stojanović, 2010: 3). Jovanović shares the principle that criminal law regulates class expression of the will, which is transferred into a legal norm with a purpose to defend the collective interest, while the criminality is seen as a social accompanying phenomenon to a class society (Jovanović, 1963: 53). Jovanović also adds that criminality used to be seen as a low class behavior, which is unacceptable to the higher classes, and that the criminalization of illegal behavior followed changes in social phenomena. What is really specific for the criminality is that it is able to outlive the class society (Jovanović, 1963: 56), and it is persistent to survive in its basic form, with no regard to the social context. In terms of the above, the oldest criminal behavior related to the acts against the government and the reputation of the ruler, and today we are faced with modern forms of criminality, which include environmental crime, i.e. in the sense of criminal law, crimes against the environment.

Criminal acts against the environment are established with the goal to protect the right to the environment, while certain authors consider that its purpose is indirect protection of the environment (Joldžić & Jovašević, 2011: 17). In addition to the clear understanding of the goals, in the domestic literature the prevailing opinion pertains to the definition of protected objects, i.e. the entrenched opinion is that criminal acts against the environment do not protect the environment, but the human right to live in a healthy environment. The issue of determining criminal acts against the environment is somewhat toned down by the legal regulations used in Criminal Code (hereinafter: CC) where crimes against the environment have their own chapter (CC, Official Gazette RS no. 85/2005, 88/2005 - cor., 107/2005 - cor., 72/2009, 111/2009, 121/2012, 104/2013, 108/2014, 94/2016 and 35/2019).

1Attorney at Law, minjablazic@hotmail.com

Unlike the issue of the definition of criminal acts against the environment, criminologists have come up with various definitions of ecological criminality. They can further be sorted into different groups - social, economic, criminological, political, legal, as well as those based on the compliance with or infringement of the law (Clifford, 1998: 5). More often than none, ecological criminality is determined as illegal action or inaction, which is against the law, and such is the subject of criminal prosecution and criminal sanction (Situ & Emmons, 2000: 3).

Criminal acts against the environment have made a long way from a simple undesirable incriminating behavior, reasoned because it was sought as a victimless crime or costs of doing business (Batričević, 2017: 251). Since the incrimination of such wrongful acts has evolved and expanded through social changes, it is without a doubt that new prohibited actions required adequate social reaction and appropriate repressive measure.

Criminal procedure is constructed in a way that criminal liability is proven criminal responsibility determined on the basis of the presented evidence, with little attention being paid to the issue of considering the consequences and understanding the person responsible for the consequences caused by his actions (Ćopić, 2015: 56).

That being said, it is clear that criminal liability can be determined if based on the evidence presented, meaning that evidentiary actions must be formulated, so that their application can establish the existence of a criminal offense and criminal liability. What is equally important is that the evidentiary actions are the foundation to justified imposition of criminal sanctions, which always needs to be adjusted to the level of social harm.

Criminal acts against the environment are criminal acts with blanket characteristics, while the consequence is loosely defined, which is justified bearing in mind that in most cases consequence of these criminal acts fail to be proven in quantity and quality. Many international enquiries point out to the rise and further complication of ecological crime. Therefore, for the analysis purpose we will use discovery data related to criminal acts against the environment and court case practice of Serbia.

By analyzing the domestic court case practice in criminal proceedings for criminal acts against the environment[2], data have surfaced that evidentiary actions used in criminal acts against the environment are: eavesdropping of the accused, questioning of witnesses, expert examination of documents and temporary confiscation of cases, while the evidentiary actions that have not been introduced in any case include: reconstruction of events, taking samples and checking accounts and suspicious transactions (Blažić Pavićević, 2023: 435).

The conducted research also showed that out of a total of 18 criminal acts against the environment[3], only 15 were prosecuted, of which 98.12% of the criminal proceedings were for the crimes of Killing

2 The research was conducted for the purposes of the author's doctoral dissertation entitled "Specificities of criminal proceedings for criminal offenses against the environment", and included the judicial practice of all primary courts in the territory of the Republic of Serbia in the period from 1 January, 2006, i.e. 1 January, 2010. as the day of the establishment of certain basic courts until 20 October, 2021.

3 The current CC in Chapter 24 provides for 18 criminal offenses against the environment, namely: Pollution of the environment (Art. 260), Failure to take measures to protect the environment (Art. 261), Illegal construction and putting into operation of facilities and assets that pollute the environment (Art. 262), Damage to facilities and devices for environmental protection (Art. 263), Damage to the environment (Art. 264), Destruction, damage, export abroad and import into Serbia of protected natural goods (Art. 265), Introduction of dangerous material into Serbia and illegal processing, disposal and storage of dangerous substances (Art. 266), Illegal construction of nuclear facilities (Art. 267), Violation of the right to information about the state of the environment (Art. 268), Killing and torture of animals (Art. 296), Transmission of infectious diseases in animals (Art. 270), Negligent provision of veterinary assistance (Art. 271), Production of harmful means for the treatment of animals (Art. 272), Contamination of food and water for feeding, i.e. feeding animals (Art. 273), Devastation of forests (Art. 274), Forest theft (Art. 275), Illegal hunting (Art. 276), Illegal

and abusing animals (Art. 269 CC), Devastation of forests (Art. 274), Forest theft (Art. 275), Illegal hunting (Art. 276) and Illegal fishing (Art. 277).

Bearing in mind the results of the conducted research, i.e. the fact that the majority of criminal proceedings are conducted for only certain criminal acts, as well as that only certain acts of evidence are used to prove these criminal acts, the question arose whether there is theoretical doubt about the existence of dark crime figures, whether there are certain problems in detecting and proving these criminal acts, as well as whether there are any comparative legal solutions that can be applied in domestic legislation.

"DARK FIGURE OF ENVIRONMENTAL CRIME"

The phenomenon *Dark figure of environmental crime* can be defined as penalized behavior which has occurred, but not registered by a competent state body (Getoš Kolac & Pribisalić, 2020: 638). Problems that surround the dark figure of environmental crime can be approached from various angles, such as lack of repression, doubt about the existence of a criminal act; from the angle that presumptions about the existence of criminal acts cannot be detected, proven or no criminal charges could be established. On the other hand, there is scientific and research understanding of the dark figure of environmental crime, which boils down to incomplete knowledge of phenomenology and etymology of the crime, because of which most of criminological analyses are only fragmented and speculative (Getoš Kolac & Pribisalić, 2020: 638). In general, when we discuss the dark figure of environmental crime, it is without a doubt that it is only an imaginary and presumptive phenomenon for which we lack hard evidence to prove its existence. It is no wonder why the scientific theory is divided when discussing and explaining this phenomenon.

In the context of criminal acts against the environment, the main reason for analyzing the dark figure of environmental crime relies on the mentioned empirical research, which has proved that only certain criminal acts against the environment are being discovered in Serbia, and that the group represents a small percentage of all criminal acts endangering certain eco-mediums. Newly woken up curiosity about this issue is based on the fact that as a society we are well informed on various pollutions that strike different eco-mediums, while at the same time we lack any statistical data with regard to criminal acts against certain eco-mediums.

We must not neglect the stand that criminal persecution is of selective nature, and in most cases depends on the readiness of an individual to approach the authorities with a claim (Getoš Kolac & Pribisalić, 2020: 665). Conducted empiric research has proven that in most cases criminal charges would be raised by direct witnesses to the crime (Blažić Pavićević, 2023: 374-423), meaning that the discovery of such criminal acts mostly relies on direct witnesses, while other acts of evidence are not used to full capacity. In the context of criminal acts against the environment, it is of great importance to point out to the fact that the protective object in these criminal acts is a human, while often an individual does not need to experience the consequence of the pollution, while the consequence can be materialized much later compared to the original action that took place. In correlation to the previous statement, the detection of criminal acts against the environment must not depend exclusively on direct witnesses, for it needs to be possible for other means of evidence to be used with the goal to detect and prove these criminal acts.

fishing (Art. 277) CC.

Having in mind everything presented, and especially the fact that the mentioned pollutions are being created in individual eco-mediums, which could have negative effect on living in an environment, almost to make it impossible for people to live in a healthy environment, a new question arouse in comparative systems regarding the act of proving via which we could discover and prove prohibited actions related to individual eco-mediums.

HARVESTING SAMPLES FROM THE ENVIRONMENT

Harvesting samples for a forensically-genetic analysis is also called the DNA analysis, meaning the analysis of deoxyribonucleic acid, which comes down to determining specific genetic code (Škulić, 2016: 238). DNA profiling was created with the idea that all individuals differ by one very specific mean of differentiation (Daeid et al., 2017: 7), while eDNA analysis originated from the idea of extraction of genetic material that organisms leave behind in the environment. The main difference between DNA and eDNA is that we extract from the samples with the former, while with the latter we harvest from the environment (Pawlowski et al, 2020: 4258). A point of divided opinion is the issue of what can be subsumed under the term sample from the environment, as the dominating aspect is that the term should be interpreted broadly, that it can encompass all organisms that are present in environmental samples.

A French criminologist Edmond Locard was one of the pioneer criminologist that pointed out to the possibility of using traces such are dust and ground (Allwood, Fierer & Dunn, 200: 1510), which is the reason why he is considered as the originator of extraction of genetic material of not human origin.

Environmental DNA – eDNA is DNA harvested from the environment (Lear et al., 2018, 8), and as such the term is used in the USA, Australia, Japan, Canada and New Zealand. eDNA originated for a purpose of solving problems of spawn and the return of the runaway salmon in the areas of Hokkaido and Sanrio in Japan (Minegishi et al., 2019: 1), as well as snail invasion in Canada (Ponce, Arismendi & Thomas, 2021: 1). It is important to point out the fact that in most cases eDNA is used in different biological researches, as well as forensic investigations.

DNA refers to the genetic material – nuclear, mitochondrial and chloroplast that is released by an organism to its environment, such as dead skin/plant cells, hair, feces, urine, saliva, mucous and gametes. Organisms in nature leave behind traces, which last for a certain time period and which can come in contact with water particles, sediments, earth or air. By using proper analysis, we could determine the presence of targeted organisms.

When analyzing DNA, it is required to separate cell materials and samples, which could contain different pollutions, mostly harvested from the ground or sediment material, as well as extracted from the grounds, sediments, leaves, fecal matter, water, ice, herbal tissue and animal tracks (Lear et al., 2018, 10).

There are different analysis via which one can analyze the composition of DNA, while some of them use plants, frequently pollen and mushrooms. Then, using microscopic techniques, we can compare samples from the certain area to the catalog of referenced material, as well as identifying geographical origin of people who left traces and tracks using microbe footprint trace (Alwood, Fierer & Dunn, 2000: 1505).

Technology used in environment testing is called metacarbonating and it includes the process of analyzing over hundred different samples. Most frequently metacarbonating is used in the process of con-

necting people with particular geo locations or in the process of identifying people who left microbe fingerprint traces (Alwood, Fierer & Dunn, 2000: 1505.)

There are certain opinions that the use of eDNA is useful with the aim of criminal acts discovery, because the perpetrator often carries some traces of the environment, without being aware of that, allowing the existence of forensic traces which are relatively present, stable and appropriate for placing the offenders at the crime scenes (Liu et al., 2022: 110828). An aggravating circumstance in this case is the fact that an ideal DNA code, suitable for every environmental trace and footprint does not exist.

There are opinions that eDNA analysis, even though it may seem as reliable, is still with its own faults, mostly because not every analysis is suitable for all climate changes. Sample contamination is always possible, the results of the analysis may not be sufficient for making a connection between people and crime scenes, as well as the cost and the fact that those analysis may be extremely time consuming[4]. Liu considers that not all DNA techniques are applicable to environmental samples, such as the Sangre's method, because it is difficult to obtain the adequate code for analysis of environmental samples. Liu suggests that the whole analysis may be broken down into five phases: soil DNA acquisition, amplicon preparation, amplicon sequencing, NGS data processing and a suspect's mud tracking.

DNA meta barcoding is NGS platform-based, correct extraction of sequences crucial for successful source tracking. There are several NGS data process pipelines – OUT, Dada2, COTU. The important issue concerning data analysis is also how soil samples can be reliably tracked back to the original place based on OTUs and their abundances. The Source Tracker and FEAST are two most popular software packages for allocating components in a microorganism community to the potential sources and the latter was claimed to be quicker and more accurate (Liu et al., 2022: 110835).

Having in mind that sample harvesting for forensic-genetic analysis is not a novelty, it is of great importance that it is considered an already familiar analysis used on other traces and tracks.

Most foreign authors dealing with this topic are of the opinion that environment sample harvesting is an evidentiary action subject to change by further development and upgrade, while results may be of great importance in criminal investigations.

In terms of the above, there is an opinion that areal reactions may be of great aid to forensic investigations, implying that it would be much easier to connect certain people to certain areas with the support of a data base of air harvested samples from various areas (Goray, et al., 2023: 926).

An environment sample analysis can be performed solely if prerequisite conditions are met, some of them being: securing proper lab reagents, expert hiring, ensuring adequate storage of samples, as well as proper sample storage. A database should also be organized, as it would be of great aid in the process of comparing the specimen to the previously inputted data.

The importance of such a laboratory should not be taken for granted, reason why we must call to mind the case which occurred in USA. In the federal state of Virginia, numerous analyses of environmental samples were performed, and some of the results were forged, the results related to water, air and earth pollution, and it all resulted in a public dismay as well as a court case (Moenssens, 1993: 5).

In Australia and New Zealand there are guidelines for designing and validation of eDNA tests, which regulate minimal requests of security and surveillance[5]. Those guidelines include the following steps: define the intended purpose of the assay; design and test the assay; validate and optimize the assay

4 https://johndrogerslaw.com/what-are-the-faults-to-dna-evidence-in-criminal-cases/, 14. Jun. 2024

5 https://research.csiro.au/environomics/wp-content/uploads/sites/187/2022/08/Environmental-DNA-test-validation-guidelines.pdf, 14. Jun 2024.

using reference samples; check analytical specificity; check analytical sensitivity; check repeatability; check reproducibility; determine thresholds (cut-offs).

Steps for metabarcoding assay development and validation are: define the intended purpose of the assay; design and test the assay (develop and test the associated bioinformatics pipeline for data analysis); validate and optimize the assay using reference samples; check reproducibility.

It is important to point out the fact that we do possess accredited laboratories which perform harvest samples from the environment, but with different goals in mind, such as soil testing, location testing, risk estimation, etc.

Of equal importance is the fact that environment sample harvesting is not an innovative evidentiary action, nor a method that requires special education of the forensic staff, yet it does require the setting of basic standards from which we must not deviate, and such standards are suitable for use in criminal matter.

USE OF eDNA IN PRACTICE

The use of environment samples as act of proving was registered in a couple of court cases in the USA, out of which the most famous would be mentioned.

Waterway system of Chicago was a great engineering project, which was a great leap forward in both commerce and industry. While works were being done, sewage was released into the lake, which further resulted in the change of direction of the waterway system of Lake Michigan. Water diversion has led to migration of Asian carp, which could slowly displace autochthonous species of fish. In a court case against the United States Army Corps of eng'rs[6] e-DNA analysis of water samples was performed in a way that certain markers were tested, which showed the presence of carp in the tested waters. The mentioned analysis later allowed the determination weather the Asian carp had migrated beyond the original habitats and weather the water diversion had impacted the migrations of carp from the waters that were its primary habitat.

E-DNA analysis was used also during the process of water samples analysis, determining the presence of perch in the Blackwater River, i.e. that analysis as the one previously mentioned was used with the aim of proving the existence of perch in fresh waters. While explaining the verdict the court took the position that even though it was treated as direct evidence, harvesting of samples must not be treated as definitive, meaning it could not solve the case in black and white[7]. The important thing is explanation: "Though it sounds complex, e-DNA sampling is elegantly simple in design. Because fish continually release DNA molecules into the water via sloughed skin, scales, mucus and feces, scientists can capture and filter water from a stream and court it for specific species' DNA. These results can help corroborate or supplement existing information indicating the probable presence or absence of species in area."

6 Case State of Michigan et al, Plaintiffs-Appellants, and Grand Traverse Band of Ottawa and Chippewa Indians v. United States Army Corps of Engineers et al, and City of Chicago, et al, United States Court of Appeals, 667 F3d 765 (2011), No. 10-3891, decided August 24, 2011.

7 Case Wild Virginia; West Virginia Rivers Coalition; Preserve Giles County; Preserve Bent Mountain, a chapter of Blue Ridge Environmental Defense League; West Virginia Highlands Conservancy; Indian Creek Watershed Association; Sierra Club; Defenders of Wildlife; Chesapeake Climate Action Network; Center for Biological Diversity, Petitioners v. United States Department of the Interior; Deb Haaland, in her official capacity as Secretary of the U.S. Department of the Interior; United States Fish and Wildlife Service, an agency of the U.S. Department of the Interior; Aurelia Skip with, in her official capacity as Director of the U.S. Fish and Wildlife Service; Cindy Schulz, in her official capacity as Field Supervisor, Virginia Ecological Services, Responsible Official, 25 F.4th 259, United States Court of Appeals, Argued: October 29, 2021, Decided: February 3, 2022.

THE POSSIBILITY OF ENVIRONMENT SAMPLES COLLECTING IN THE PRACTICE OF DOMESTIC COURTS

Sample collecting is an evidentiary action that is introduced to the domestic legislature with Criminal Procedure Code (hereinafter: CPC) (Law of criminal procedure, Official Gazette RS, no. 72/2011, 101/2011, 121/2012, 32/2013, 45/2013, 55/2014, 35/2019, 27/2021 - decision CC and 62/2021 – decision CC) in 2001, and it includes harvesting of biometric samples, harvesting samples of biological origin and taking samples for forensic-genetic analysis. Biometric samples are constant physical characteristics of a person (Art. 140 CPC), samples of biological origin are real samples of human, animal and plant origin (Art. 141 CPC). Samples for forensic genetic analysis represent sampling by analysis of DNA reactions (Art. 142 CPC).

By the process of analyzing the domestic legislature and rules regarding e-DNA we approach a certain vagueness, meaning that certain norms of domestic legislature are based on the principle that biometrical samples and samples of biological origin could be collected exclusively from a human being. Although these samples may be of both herbal and animal origin, sample collecting may occur only once and be of human origin, meaning of people and animals. Contrary to the above, samples for forensic-genetic analysis may be harvested from a defendant, a victim, as well as other people; from either crime scene or other places containing traces of criminal acts. We must bear in mind that a crime scene or place that holds traces of criminal act needs to be understood in the contexts of a place where the defendant committed a certain action, or where the consequence occurred, as well as any other places where we could find items, objects and traces, may lead us to the conclusion that there is no limits to collecting samples of human nature (Ilić, Majić, Beljanski & Trešnjev, 2016: 400).

The above statement not only points out the fact that there is no limitation to harvesting samples for forensic-genetic analysis solely to samples of human nature, but also raises the question whether that capacity of modern forensics allows the analysis to be performed on the samples of biological origin. A possible problem to this is a fact that up to now a general opinion has been that only human originated samples can be taken into consideration in the process of harvesting samples, which does not imply that taking samples of biological origin are against the legal norms of current CPC.

If we consider the possibility of using these samples and the possibility of their suitability for discovery and proving of certain criminal acts, it is certain that harvesting samples from the environment could be used in correlation to eco-medium pollution, pollution of water, air, soil, and that such samples could be beneficial in the discovery of the following criminal acts: Environmental pollution (Art. 260), Failure to take measures to protect the environment (Art. 261), Illegal construction and putting into operation of facilities and assets that pollute the environment (Art. 262), Damage to facilities and devices for environmental protection (Art. 263), Damage to the environment (Art. 264), Destruction, damage, export abroad and import into Serbia of protected natural goods (Art. 265), Import of dangerous substances into Serbia and illegal processing, disposal and storage of dangerous substances (Art. 266), Unauthorized construction of nuclear facilities (Art. 267), Transmission of infectious diseases in animals (Art. 270), Contamination of food and water for consumption, i.e. feeding animals (Art. 273) CC.

CONCLUSION

Criminal acts against the environment are criminal acts which, considering the severity of a possible penalty, would not be considered to be in a group of criminal acts with insignificant social danger. In correlation to that, we may come back to the standpoint that strengthening of possible penalties is not the only method to fight crime. For punishments in middle ages, we can fairly say from modern point of view that they were draconian, and as such they did not result in lowering the criminality, but rather spread discontent to their disproportion and the way of enforcement (Konstantinović Vilić & Kostić, 2011:80). With that in mind, we consider that strengthening of criminal punishments may not always result in suppression of crime, and that vague limits of criminal area (Stojanović, 2016: 13), as well as issues surrounding the discovery and proving of criminal acts cause other problems.

When we talk about crimes against the environment, we can say that the regulation do not have too many shortcomings, i.e. that what is recognized as a problem is not the incrimination of the act and the amount of the threatened penalties, but that there is an insufficient and inadequate impact on the individual, as well as on society as a whole, which is the result of problems in detecting and proving these crimes. In this regard, one of the ways of improving the detection and proof of certain criminal acts against the environment polluting individual eco-media, i.e. reducing the dark figure of environmental crime, is based on the possibility of taking samples from the environment in such a way that the Criminal Code could be properly applied, and an appropriate criminal sanction could be imposed, and the purpose of punishment could be achieved, both in the context of influencing the individual not to repeat the criminal act, as well as influencing the entire society to realize that certain behaviours are not legally acceptable.

Namely, taking samples from the environment would be objective and immediate evidence that would certainly have to be valued both individually and together with all other evidence. What would complicate the position of the defendant in the criminal proceedings is the fact that the use of this evidentiary action would require to a certain extent the engagement of professional assistance - defense counsel in order to achieve the equality of the parties in the proceedings (Blažić Pavićević, 2018: 397). Namely, the use of this evidentiary act undoubtedly requires the expertise of both forensic experts and special knowledge of the prosecuting party, which could objectively put the defendant in a position of "arms inequality" (Blažić Pavićević, 2020: 359). The above does not mean that there are grounds for expanding the institution of mandatory defense, but only that the expansion of this evidentiary action could lead to the need to engage professional assistance in order to exercise the right to defend the accused.

What is also important is the fact that taking samples from the environment requires the existence of accredited laboratories, provision of conditions for conducting analyses, provision of appropriate reagents, training of laboratory workers, and provision of adequate sample storage.

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THE NEXT DIGITAL ERA: POST-QUANTUM CRYPTOGRAPHY

Zoltán Rajnai, PhD
Donát Bánki Faculty of Mechanical and Safety Engineering, Óbuda University
Budapest, Hungary

Attila Nagy, PhD Student[1]
Doctoral School on Safety and Security Sciences, Óbuda University
Budapest, Hungary

INTRODUCTION

A Chinese study claimed that by 2025, quantum computers will be able to crack the RSA algorithm. (B. Yan et al., 2022) If this is true, people's privacy or countries' data will be in big trouble, and we may have to stop communicating on the Internet. Our economies have switched to fast communication, which is why this would be a big break for societies. Fortunately, a year later, another study refuted the Chinese study, having showed that we would not be able to crack RSA encryption by 2025 (Khattar & Yosri, 2023). This is a great relief for us, but still, we have to be careful and prepare for Q-day. The SNDL attack is also a source of danger. SNDL (Store Now, Decrypt Later) attack is one of the most significant threats that arise in connection with the development of quantum technologies. In this attack method, attackers currently collect and store data with the goal of hacking it later when quantum computers are available. This can be especially dangerous for data that requires long-term secrecy, such as military or state secrets. (*Quantum Computing: The Growing Threat Of SNDL*, 2024) We don't know how to defend against this attack. Countries and organizations are still spying to find out who is doing what. We assume that there will still be surprises in this area in the future. Investing in the development of quantum technologies requires significant resources. Investments in quantum research and development of some major countries are presented below. The US has invested billions of dollars in quantum research, including the National Quantum Initiative (NQI), which provided $1.2 billion in funding over five years. (The National Quantum Initiative Supplement to the President's FY 2024 Budget, 2023) China devotes significant resources to the development of quantum technologies, having invested more than 15 billion dollars in the establishment of the National Quantum Computing Science and Technology Center. (*How Is China Investing in Quantum Technology?*, 2023) Russia announced an investment of 790 million dollars in the development of quantum technologies by 2024. (*Russian Scientists Expect A 50-Qubit Quantum Computer By End Of 2024*, 2024) The European Union has invested 1 billion euros in the Quantum Flagship program, which supports quantum research and innovation for ten years. Since 2018, the EU and its member states have spent more than 8 billion euros on quantum technologies. (*European Industry Is yet to Embrace the Potential of Quantum Technologies,* 2024) Based on these statistics, it can be seen that the great powers of the world are devoting serious resources to the development of quantum technologies, realizing their potential. Developments are taking place in many areas, such as materials science, cyber security, as well as pharmaceutical research and artificial intelligence. These efforts could bring significant breakthroughs in many aspects of technology. In the following

1 attila.nagy@bgk.uni-obuda.hu

section of the paper, we present which algorithms have been compromised and which may become the new standard, so that our societies are prepared for the Q-Day.

ALGORITHMS

Rivest-Shamir-Adleman Algorithm

In cryptography, there are three main types of encryption methods: symmetric algorithms, asymmetric algorithms, and hash functions. RSA encryption was published in 1977 by RL Rivest, A. Shamir, and L. Adleman. The name RSA came from the initials of the researchers' names (Rivest-Shamir-Adleman). The RSA encryption algorithm is an asymmetric encryption process or method. In the RSA algorithm, messages are encrypted using the public key, and only the owner of the private key can decrypt them. This is the basis of asymmetric encryption methods. The special feature of the RSA encryption algorithm is that publishing the public key does not mean publishing the private key, which has two important consequences. First, it is not necessary to use couriers or other secure means to transmit the keys, since the message can be encrypted with the recipient's public key, and only he can decrypt it with his own private key. Second, a message can be "signed" with the private key, and anyone can verify this signature with the public key. Signatures cannot be forged, and the signer cannot later deny the validity of the signature. This can also be useful in electronic correspondence and electronic financial transactions. In the RSA encryption process, a message is represented as a number that is raised to a publicly specified power and then the remainder is taken with another publicly specified number that is the product of two large secret primes. Decryption is done in a similar way, but a different, secret power is used. Part of the security of RSA is based on the difficulty of factoring the published number.

Details of the RSA Algorithm

The message is encrypted with a public key consisting of a pair of numbers (e, n), where n is the product of two large primes. Encryption is done as follows: the message is represented as a number, then it is raised to the e power and the remainder is divided by n. Decryption is done with the private key, which consists of another pair of numbers (d, n), where d is a specially chosen number.

In practice, when using the RSA algorithm, each user publishes their public key while keeping their private key secret. Anyone can use the public key to encrypt the message, but only the owner of the private key can decrypt it. The RSA algorithm was a major advance in cryptography as it enabled secure communication without the need for keys to be transmitted securely and enabled the use of digital signatures that could be authenticated and non-repudiated. (Rivest et al., 1978)

Elliptic Curves

Elliptic curve cryptography (ECC) is one of the strongest and most efficient techniques in modern cryptography. The strength and efficiency of ECC is based on the use of mathematical operations that work with elliptic curves. ECC is more secure than many other cryptographic methods and plays a prominent role in the security of web and mobile applications. The encryption system of ECC consists of the following elements: the plaintext, the key and the secret text. The key can be public, private, or partially public and partially private. When generating the keys for ECC, we randomly choose two points on the elliptic curve and determine the private and public keys. ECC encryption and decryption is based on mathematical operations that use curve addition and multiplication. The advantages

of ECC include greater security and shorter key lengths, which require less storage space and enable faster operations. The ECC key is 256 bits long, which provides the same security as a 3072-bit RSA key. The disadvantage of ECC is its calculation requirement, which results in low efficiency. ECC is used in many fields, such as the Elliptic Curve Digital Signature Algorithm (ECDSA) and the SM2 algorithm. ECDSA enables the creation and authentication of digital signatures that ensure data integrity and authenticity. Elliptic curve cryptography is one of the most important modern cryptographic methods, providing greater security than many other encryption methods. ECC can be further improved through the development of accelerators and algorithms, and it can be effectively used in many application areas. (Y. Yan, 2022)

Diffie – Hellman Key Exchange Algorithm

The Diffie-Hellman key exchange algorithm, developed by Whitfield Diffie and Martin Hellman and published in 1976, showed new directions in the field of cryptography. The goal of this study was to develop new types of cryptographic systems that minimize the need for secure key distribution channels and are equivalent to written signatures.

Key exchange: Two parties can generate a shared key by exchanging public information that cannot be decrypted by a third party.

Public key system: The encryption and decryption keys are separate, so the encryption key can be made public without compromising the decryption key.

Digital signatures: Allows messages to be authenticated in such a way that the encryption key is public, while the key needed to create the signature remains private.

The problems of cryptography began to be solved in parallel with the theoretical development of communication and computer science. The security of cryptography largely depends on how computationally demanding the determination of the decryption key is. This problem falls into the fields of computational complexity and algorithm analysis, which examine the difficulty of solving computational problems. The Diffie-Hellman algorithm and their publication showed new directions in cryptography, enabling secure communication without the need for secure transmission of keys and promoting the use of digital signatures that could be authenticated and not forged. (Diffie & Hellman, 1976)

Shor's algorithm is dangerous for all three encryption methods mentioned above. In the next section, the Peter Shor algorithm is presented.

Shor's Algorithm

Peter Shor first presented his algorithm in 1994, offering an efficient solution for prime factorization and discrete logarithms for quantum computers. The basis of the algorithm is the quantum Fourier transform and the superposition of quantum states. The most important steps and concepts are Quantum Fourier Transform, Superposition and Interference, Prime Factorization, Discrete Logarithms. Quantum Fourier transform: The Quantum Fourier transform (QFT) is the basic tool of the Shor algorithm. This enables the rapid transformation of quantum states, which greatly increases the computational speed compared to classical computers. Superposition and Interference: The algorithm uses quantum mechanical properties such as superposition and interference to perform computational tasks. Through superposition, the quantum computer manages several possible states at the same time, while interference helps to choose the correct solution. Prime factorization: The Shor algorithm can efficiently determine the prime factors of a large number. This compromises the security of tradi-

tional RSA encryption, as RSA relies on the difficulty of factoring integers. Discrete logarithms: The algorithm can also be used to solve the discrete logarithm problem, which forms the basis of many other cryptographic systems such as elliptic curves and Diffie-Hellman key exchange. The importance of the Shor algorithm lies in the fact that it showed that quantum computers can fundamentally change the security basis of current cryptographic protocols. Although practical quantum computers are still under development, the theoretical foundations already demonstrate the potential applicability and future challenges in the field of cryptography. (Shor, 1997)

QUANTUM COMPUTERS

Quantum computers are computers that use the phenomena of quantum mechanics to perform computational tasks. Their basic unit is the quantum bit (qubit), which can be both 0 and 1 at the same time due to the principle of quantum superposition. This property allows quantum computers to perform multiple calculations in parallel, significantly increasing their computing capacity compared to classical computers. A quantum bit, or qubit, is a quantum mechanical system that can take two states: |0 ” and |1 ”. However, superposition can take any linear combination of them, such as a|0 ” + b|1 ”, where a and b are complex numbers and |a|^2 + |b|^2 = 1. This ability is the basis of parallel computing, which is one of the most important advantages of quantum computers. Another basic principle of the operation of quantum computers is entanglement, which allows a quantum mechanical connection to develop between two or more qubits. Its intertwined states of qubits are connected, so a change in the state of one qubit immediately affects the state of another qubit, regardless of their distance. This entanglement enables the efficiency and speed of quantum algorithms. In 1982, Richard Feynman explained that quantum mechanical simulations could make calculations more efficient by overcoming the limitations of classical computers. In 1994, Peter Shor published his algorithm, which showed that quantum computers can efficiently factorize large numbers, which fundamentally shook classical encryption systems. In 1996, Grover developed a fast database search algorithm that demonstrated further applications of quantum computers. The development of quantum computers involves many technical challenges, such as making qubits fault-tolerant and maintaining stable quantum states over long periods of time. Currently, Google, IBM, Intel and Rigetti are leading the development of multi-qubit systems, but these machines are not yet widely available to the public. Quantum computers can make significant advances in solving complex problems such as factorization, search algorithms, molecular modeling, and cryptography. Quantum algorithms can perform special tasks more efficiently than classical algorithms. For example, the Shor algorithm is suitable for factoring large numbers, while the Grover algorithm is suitable for fast database searches. These algorithms use a series of quantum gates that form quantum circuits. Quantum computers have significant potential to increase computing capacity and develop new cryptographic methods, although the technology is still in its early stages of development. Quantum computers are innovative devices that can significantly increase computing capacity by utilizing the principles of quantum mechanics. Through superposition and entanglement, they perform parallel computations and provide new possibilities in many areas such as cryptography and modeling of complex systems. The technology is still developing, but quantum computers are already attracting a lot of interest from the scientific community and the technology industry. (Amundson & Sexton-Kennedy, 2019; Ishita Ray, 2011; Yanofsky, 2007)

POST-QUANTUM CRYPTOGRAPHY

Quantum encryption and post-quantum cryptography are part of quantum communication, but they are separate fields. Post-quantum cryptography (PQC) is also called quantum-safe or quantum-resistant cryptography. Quantum encryption includes a quantum key distribution (QKD) and associated protocols such as BB84 or B92. This also includes quantum networks. (Nagy & Rajnai, 2024) Post-quantum cryptography will be presented in detail below.

The National Institute of Standards and Technology (NIST) is an agency of the US government whose main task is to define and maintain technological and scientific standards. For example, NIST is responsible for maintaining a digital library of mathematical functions and popularizing the metric system in the United States. The emergence of quantum computers poses a serious challenge to current cryptographic systems. To address this, NIST announced a competition in 2016 to develop and standardize post-quantum cryptographic standards. This competition is currently ongoing and seeks to find new cryptographic algorithms that can withstand the threats posed by quantum computers. NIST's third round report examines various types of post-quantum cryptography based on different mathematical problems to provide protection against quantum computers. Four algorithms were standardized, and four other algorithms advanced to the next round. We will now move on to deal with the family of encryption algorithms and describe the four standardized algorithms. (Alagic et al., 2022)

Lattice-based Cryptography: Lattice-based cryptography is based on the mathematical structures of grids, where the grid points are located in a space. These systems often use problems like Shortest Vector Problem (SVP) and Learning With Errors (LWE), which prove difficult to solve even for quantum computers. Such algorithms offer a high level of security and are highly scalable, which is why they are popular in post-quantum cryptography. Code-based Cryptography: Code-based cryptography is based on error-correcting codes, such as Goppa codes. One of the best-known code-based cryptosystems is McEliece, a cryptosystem that provides strong protection against attacks by quantum computers. These algorithms have been known and studied for decades and have proven to be very secure, although they often have large public key sizes. Multivariate Cryptography: Multivariate cryptography uses multivariate polynomials as the basis for encryption and signature schemes. Such systems are usually fast and efficient, but their security depends heavily on the complexity of the polynomials. Rainbow and Unbalanced Oil and Vinegar (UOV) algorithms are examples of multivariate cryptographic methods. Hash-based Cryptography: Hash-based cryptography uses the properties of hash functions for secure communication and data protection. One of the best-known hash-based signature schemes is based on Merkle trees, which enable efficient and secure digital signatures. SPHINCS+ is an example of a hash-based signature algorithm that can be considered quantum secure. Isogeny-based Cryptography: Isogeny-based cryptography is based on isogenies of elliptic curves, which are difficult to calculate even for quantum computers. One of the best-known examples of this type of cryptography is Supersingular Isogeny Key Exchange (SIKE), which has a small key size and high security. These algorithms are of particular interest in quantum-resistant key exchange protocols. Non-commutative Cryptography: Non-commutative cryptography is based on non-commutative algebras such as quaternions or certain groups. These systems use structures in which the order of elements matters, which can provide special security advantages. This type of cryptography is still relatively new and an area of research, but it offers promising possibilities in quantum-resistant cryptography, although the non-commutative cryptography type did not make it to the third or fourth round. Each of these different types of cryptography offers different advantages and challenges, and together they provide the diversity and robustness of post-quantum cryptography. (Alagic et al., 2022) Now let us look at the four standardized algorithms.

CRYSTALS- Kyber

CRYSTALS-Kyber is the key encapsulation mechanism (KEM) selected by NIST in the post-quantum cryptography standardization process. The algorithm is based on the Modulated Learning with Errors (MLWE) problem, which offers significant efficiency advantages over similar schemes based on MLWE. Kyber is an IND-CPA-secure public key cryptography (PKE) scheme that is transformed into an IND-CCA-secure KEM using a Fujisaki-Okomoto-type transformation. The basic PKE scheme comes from the MLWE problem, which is defined in a cyclotomic power-of-2 ring. The rank of the module can be k = 2, 3 or 4, which corresponds to the security categories (1, 3, 5). Other parameters of Kyber include an integer modulus q = 3329 and a public matrix of polynomials generated from a uniformly random 256-bit string. In the Kyber encryption process, a message is encrypted using a polynomial vector, then the result is encoded using another polynomial vector and adding an error product. During decryption, the secret key is used to recover the message after the ciphertext is properly "decompressed". Kyber inherits a strong theoretical security foundation from the decade-long literature of grid-based cryptography. The MLWE problem has been widely studied, and there is evidence that increasing the rank of a module improves performance without significantly degrading security. Kyber uses a variant of the FO transformation to achieve IND-CCA security, and its security proofs are tight in the ROM model and not tight in the Quantitative Random Oracle Model (QROM). Kyber offers fast key generation, encapsulation and decapping in a software environment. A number of optimization works have been done on the software and hardware implementations of Kyber, showing excellent performance in both environments. Kyber's key and ciphertext sizes are acceptable for most applications, and its performance is outstanding in FPGA implementations. Overall, based on security and performance data, Kyber is an excellent choice for post-quantum cryptographic environments that NIST wants to standardize. (Alagic et al., 2022)

CRYSTALS- Dilithium

CRYSTALS-Dilithium is the digital signature algorithm selected by NIST in the post-quantum cryptography standardization process. This algorithm is based on a combination of grid-based cryptography and the Fiat-Shamir paradigm, which has strong security and performance characteristics. The Dilithium algorithm is built around the ring Rq: = Zq [X]/ (X256 + 1), where q is a prime number. The public key basically consists of a Modulated Learning with Error (MLWE) pattern of the form (A, t: = As1 + s2), where A is a matrix in the ring Rq and s1 and s2 are error vectors. A distinctive feature of Dilithium is that the error vectors use a uniform distribution, as opposed to the truncated Gaussian distribution typically used. Dilithium is the "Fiat-Shamir with aborts" approach introduced by Lyubashevsky. This procedure uses a three-message lattice-based authentication scheme that allows the prover to convince the verifier that he has the secret key (s1, s2) without revealing it. In the signature scheme, the prover generates a vector consisting of the higher order bits of Ay. The verifier randomly chooses a polynomial, then the prover responds with the vector z: = y + cs1 may leak information from s1, so careful sampling steps are required to ensure its coefficients are of the correct magnitude. The security of Dilithium starts from the decision Module-LWE assumption, which ensures that the public key does not leak information about the private key. Additional assumptions, such as SelfTargetMSIS, allow Dilithium to be strongly unforgeable in the QROM. Dilithium offers several parameter settings that increase security, although increased security sometimes results in larger keys and slower performance. Dilithium uses pseudo randomness and truncated storage techniques to improve performance. The elements of Rq are computed and stored using an NTT-based implementation for fast polynomial multiplication. Along with FALCON, Dilithium is one of the most effective signature

protocols of the third round. FALCON generally offers shorter keys and signatures, although Dilithium does not require floating-point arithmetic, which may be beneficial for some implementations. CRYSTALS-Dilithium is an efficient, relatively easy-to-implement signature scheme with a strong theoretical security foundation and an encouraging cryptanalytic history. It is an excellent choice for a wide range of cryptographic applications and was therefore selected by NIST as the primary signature algorithm for standardization. (Alagic et al., 2022)

FALCON

FALCON (Fast Fourier Lattice-based Compact Signatures over NTRU) is a grid-based digital signature scheme based on the "hash-and-sign" paradigm. FALCON was selected by NIST for its post-quantum cryptographic standardization process, especially for applications with low bandwidth and fast authentication requirements. FALCON follows the Gentry, Peikert and Vaikuntanathan (GPV) framework introduced in 2007. This framework uses grid-based trapdoor functions to generate signature schemes using preimage sampling. FALCON uses NTRU lattices, which are generated in the following form: the secret key consists of polynomials (f, g, F, G ∈ Z[x] / (x^n + 1)) satisfying fG - gF ≡ q relationship. The public key is h = g/f. The FALCON trapdoor preimage sampling algorithm is relatively complex and requires floating-point arithmetic, which can be challenging for secure implementations. FALCON's data structures, such as the FALCON tree, add further complexity but ensure compact public key and signature sizes. The theoretical security of FALCON is based on the difficulty of the SIS problem over NTRU grids. FALCON is probably unfalsifiable in the QROM. The FALCON core's SVP safety is conservatively estimated to be similar to that of Dilithium. Certain desired "beyond tamperproof" security features are not offered by FALCON but can be added with a simple transformation with minimal performance loss. Among the third-round digital signature schemes, FALCON offers the smallest bandwidth (public key and signature size combined). Signature verification is fast, while signature generation is slightly slower compared to Dilithium, and key generation is significantly slower. Due to its low bandwidth and fast authentication, FALCON can be advantageous in certain limited protocol scenarios. FALCON was chosen for standardization because NIST trusts its security (provided it is implemented correctly) and because its low bandwidth may be essential in some applications. FALCON's low bandwidth and fast authentication make it an ideal choice for applications where bandwidth and authentication speed are critical. (Alagic et al., 2022)

SPHINCS+

SPHINCS+ is the digital signature algorithm chosen by NIST, which is hash-based and stateless. This algorithm provides excellent security based solely on the security of symmetric primitives, thus providing a robust defense against quantum computers. SPHINCS+ combines single signatures, multiple signatures, Merkle trees, and hypertrees to create a general-purpose digital signature scheme. One of its most important features is that it does not require state preservation between different signatures, in contrast to other hash-based signature schemes, which are faster and result in smaller signatures, but require state management. SPHINCS+ is based on three different hash functions: SHAKE256, SHA-256 and Haraka. The cryptographic security of SPHINCS+ is based solely on the security of the underlying hash functions. This security assumption is independent of other finalist signature schemes such as Dilithium and FALCON, so SPHINCS+ can serve as a useful backup in case of unexpected cryptanalytic attacks. However, the complexity of the algorithm can be a problem for implementation security, and evaluating the security of the entire system can be more difficult for a more complex algorithm. SPHINCS+ key generation and verification is much faster than signature genera-

tion. SPHINCS+ public keys are very short, but signatures are relatively long. Even at security category 1, the signature with the smallest and slowest parameters is around 8 KiB, much larger than alternative signature schemes such as FALCON or Dilithium. At the beginning of the third round, new parameters were chosen for security categories 1 and 3. Also, during the third round, a bug was discovered in SPHINCS+'s security reduction, which was fixed. Two attacks have surfaced that challenge the SHA-256-based versions of SPHINCS+ Category 5 security parameters. The first attack occurred in February 2021, and a month later the SPHINCS+ team proposed a fix. The second attack was disclosed in April 2022 and similarly affected SHA-256-based parameters, but the previously proposed patch did not resolve the issue. SPHINCS+ was chosen for standardization because this algorithm provides the necessary security, although it is larger and slower than grid-based signatures. SPHINCS+ is a mature scheme that provides an alternative solution for defense against quantum computers, minimizing the risk that any cryptanalytic breakthrough will leave NIST without a viable signature scheme. (Alagic et al., 2022)

Algorithms that Made it to the Fourth Round

Based on NIST's third round report, the following algorithms remained in the competition for the fourth round. These algorithms are undergoing further evaluation and analysis before final standardization decisions are made.

BIKE (Bit Flipping Key Encapsulation):

It is based on binary linear quasi-cyclic medium density parity check codes (QC-MDPC). It was originally designed to use ephemeral keys, but it is said to work with static keys as well. It rests on a strong theoretical foundation and has proven resistant to many attacks. (Alagic et al., 2022)

Classic McEliece:

It is based on traditional code-based cryptography that uses Goppa codes. It is characterized by a high level of security and has been studied for a long time. It is secure as it is resistant to quantum attacks and is supported by well-known cryptanalytic results. (Alagic et al., 2022)

HQC (Hamming Quasi-Cyclic):

Based on error correcting codes and quasi-cyclic structures, it offers good performance in both software and hardware environments. It is based on a solid theoretical foundation and many attack scenarios have been considered in its evaluation. (Alagic et al., 2022)

SIKE (Supersingular Isogeny Key Encapsulation):

It is based on isogenies of elliptic curves. It offers small key sizes, which can be beneficial in certain applications. It is based on special mathematical problems that are currently resistant to quantum computer attacks. (Alagic et al., 2022)

For the sake of transparency, we have compiled the standardized algorithms, those awaiting standardization and those that have been eliminated from the competition in a table.

Table 1. *Post-Quantum Cryptography*

NIST competition	Algorithms	Encryption family	Category
Winner of round 3	CRYSTALS- Kyber	Grid-based Cryptography	SPY
Winner of round 3	CRYSTALS- Dilithium	Grid-based Cryptography	Digital signature
Winner of round 3	FALCON	Grid-based Cryptography	Digital signature
Made it to the 4th round	Classic McEliece	Code-based Cryptography	Public key encryption
Made it to the 4th round	BIKE	Code-based Cryptography	SPY
Made it to the 4th round	HQC	Code-based Cryptography	SPY
Fell out	Rainbow	Multivariate Cryptography	Digital signature
Winner of round 3	SPHINX +	Hash-based Cryptography	Digital signature
Made it to the 4th round	SIKE	Isogeny-based Cryptography	SPY

CONCLUSION

The paper discusses the challenges associated with the advent of quantum computers and the importance of post-quantum cryptography. Advances in quantum technologies could have a major impact on current cryptographic systems, especially the RSA encryption algorithm, which some predict quantum computers will be able to break by 2025.

SNDL (Store Now, Decrypt Later) is a method of an attack wherein attackers currently collect and store data with the goal of hacking it later when quantum computers become available. This is especially dangerous for information requiring long-term secrecy, such as military or state secrets.

The importance of global investments is also detailed in the study. The USA, China, Russia and the European Union are devoting significant resources to quantum research and development. The United States, for example, has invested $1.2 billion over five years under the National Quantum Initiative (NQI) program. China has earmarked more than $15 billion for the establishment of the National Quantum Computing Science and Technology Center. Russia has announced an investment of 790 million dollars by 2024, while the European Union has invested 1 billion euros in the Quantum Flagship program.

The post-quantum cryptographic algorithms that NIST (National Institute of Standards and Technology) standardized the third round are the following four: CRYSTALS- Kyber, CRYSTALS- Dilithium, FALCON and SPHINCS+. Four other algorithms - Classic McEliece, BIKE, HQC and SIKE - remained in the competition for the fourth round. These algorithms are based on various mathematical problems, providing protection against quantum computers.

The paper describes in detail the different types of cryptography and their advantages, and presents the algorithms selected by NIST and their properties. Finally, it emphasizes the importance of post-quantum cryptography for future secure communication and privacy.

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GEOGRAPHIC PROFILING – ENVIRONMENTAL AND OFFENDERS' BEHAVIOR PATTERNS OF ROBBERY CHARACTERISTICS

Ksenija Butorac, PhD[1]
University of Applied Sciences in Criminal Investigation and Public Security
Ministry of the Interior, Zagreb, Croatia

Dubravka Maurer, PhD Student
Anja Batina, PhD Student
Faculty of Geodesy, University of Zagreb, Croatia

INTRODUCTION

Understanding the geography of crime has become increasingly important in crime analysis. The connection between the characteristics of the criminal act, the characteristics of the place of a commission of criminal offence, as well as the perpetrator's performance methods in a geospatial environment indicate that the choice of intended target by the perpetrator is not random. Nevertheless, it is most often caused by some psychological and geospatial characteristics (Milojković & Petrović, 2019:10).

Spatial analysis of crime can play important role in the policing and the crime reduction process, it can be employed in both an exploratory and more confirmatory manner with the purpose of identifying how ecological factors influence the spatial pattern of crime. Crime mapping can help law enforcement and policy makers to explore crime patterns, offender mobility, and serial offences over space and time (Amoako, 2021; Butorac & Marinović, 2017). Ecological theories, such as routine activity theory and rational choice theory, suggest that crime occurs when motivated offenders and suitable targets converge in time and space (Anselin et al., 2000). Therefore, understanding the spatial and temporal components of crime patterns is crucial. In urban areas, crime is not random or homogeneous, so scientists aim to identify the environmental features of places that may contribute to crime (Di Bella et al., 2015). The movements of offenders and targets are influenced by their daily routines and the social and physical surroundings in which they interact (Kannan & Singh, 2021). For example, studies of the spatial patterns of robberies in urban environments have revealed that a small number of micro places generate a disproportionate number of robberies. Certain high-risk facilities, such as streets corners, bars, convenience stores, and banks, at places tend to experience a disproportionate amount of robbery (Braga, Hureau & Papa Christos, 2011). The length of the criminal path (journey to crime), or the distance between the offender's anchor point and the crime location, is an important spatial component (Andresen, Frank & Felson, 2014). The likelihood of committing a crime decreases as the distance from the anchor point increases, known as the distance decay effect. Factors such as local geography and decision-making processes influence the pattern of distance decay (O'Leary, 2011), which can be described using different decay functions (Hammond & Young, 2011). Numerous studies have demonstrated the distance decay effect in different types of crime and its relationship with various sociodemographic features (Hesseling, 1992; Koppen & Jansen 1998; Bernasco & Luyx, 2003; Bernasco & Nieuwbeerta, 2005; Bernasco, 2006). The spatial patterns of crime are not only influenced

1 kbutorac@fkz.hr; ksenija.butorac@gmail.com

by the location, but also by the time of the crime. Understanding the temporal dimension of crime is crucial as it provides opportunities for crime based on spatial accessibility. Additionally, the social characteristics of offenders have been found to be significantly correlated with specific types of crime (Wang, Lee & Williams, 2019; Bernasco & Ruiter, 2018).

Crime patterns are analysed based on socio-demographic, temporal, and spatial attributes, and can be visualized by using graphs, tables, and maps (Wortley & Mazerolle, 2009; Milojković & Petrović, 2019). Geospatial data processing technology allows for a better understanding of crime patterns and the analysis of connections between socio-demographic, spatial, and temporal features. This information can be used for operational and strategic planning to enhance community security (Butorac, 2011). Though it is not the focus of this paper, it is certainly noteworthy to mention related studies on Kernel Density Mapping, hotspot identification, and predictive accuracy of crime maps. For example, the study by Milić, Popović, Mijalković, and Marinković (2019) specifically examines the effects of different classification methods on the accuracy of Kernel Density Estimation hotspot maps, recommending an incremental mean approach for optimal predictive results. Additionally, the study by Eman, Györkös, Lukman and Meško (2013) analyses property crime using GIS and identifies the *areas* having high *crime* intensity, i.e. the crime hotspots. The study by Milić (2013) highlights the benefits of combining computer automated geographic methods with field investigations for early crime detection and analysis of crime hot spots, emphasising the potential for improved policing and crime prevention through advanced analytical tools like GIS.

PURPOSE

Geographic profiling is a crime analysis technique that uses the locations of a connected series of crime sites to identify or to predict the offender patterns and to determine the most probable area of offender residence. This paper is a part of the research project *Geographic profiling of robberies in the area of the City of Zagreb*, which has been run since 2018. The project objectives are to investigate spatial patterns and related variables influencing the criminal path of robbers, as well as the temporal components of crime. The ultimate goal is to acquire new knowledge in perpetrators geo-profiling in order to make informed decisions based on the findings obtained. The use of geographical information systems (GIS) is necessary for crime analysts to explore data from various perspectives, such as date-based, spatial, and field attributes, to analyse crime data. GIS tools aid in investigating incident data and addressing specific problem subsets. Crime analysts contribute to the data-driven crime reduction efforts of law enforcement agencies by employing tactical and strategic analysis methods to identify short-term patterns and evaluate long-term crime issues and trends. Spatial analysis, in particular hotspot identification and criminal paths, are crucial in these methods. Crime analysts also assist investigations by analysing data to uncover criminal networks and comprehend suspect activity patterns.

DESIGN /METHOD/APPROACH

The research methodology involves collecting and processing police crime data on robbery crimes recorded and investigated in 2018 as well as publicly available geographical and census data to enhance the research findings. It utilises geospatial data processing technology to analyse crime patterns and connections between socio-demographic, spatial and temporal features of the criminal events. The study focuses on the use of GIS to analyse and visualise crime data. The analysis is only as good as the input data, and in this case, the data collected from the police administration had limitations in terms

of spatial resolution due to the GDPR[2] protection of personal data of identifiable living individual. Respectively, personal data that has been de-identified, encrypted or pseudonymised, but can be used to re-identify a person, remains personal data and falls within the scope of the GDPR. Therefore, the spatial resolution of robbery locations and offender residency are determined at the neighbourhood level. In order to obtain more accurate criminal paths using street routing distances, additional sources were utilised to gather more detailed location data, whenever possible.

STUDY AREA

The study area includes the City of Zagreb and parts of the Zagreb County, specifically focusing on the robbery data in 2018 under the jurisdiction of the Police Directorate Zagreb (Figure 1). The City of Zagreb is divided into 17 administrative districts (Zagreb in Figures 2022), which are further classified into 11 neighbourhoods by police administration (Table 1). It covers an area of 641 km^2. Zagreb County consists of 9 towns and 25 municipalities, covering an area of 3 060 km^2. The study specifically includes the robbery data from 8 towns and 7 municipalities in Zagreb County, of total surface area of 1 903 km^2 (Table 1).

Zagreb is the capital and the largest city in Croatia, with a population of 767,131 citizens according to the 2021 census by Croatian Bureau of Statistics (Croatian Bureau of Statistics, 2022). It is also the only city in Croatia with a metropolitan area that exceeds one million people, including the towns from Zagreb County.

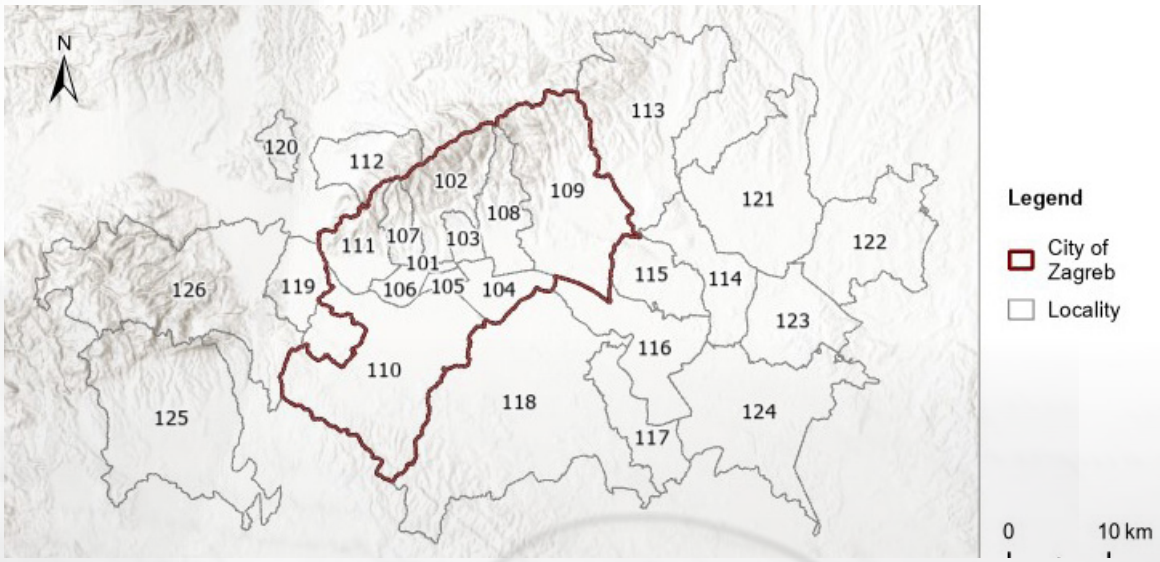


Figure 1. *The Study Area Encompasses the City of Zagreb and Parts of Zagreb County*

2 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation). Accessed on May 20, 2024. https://eur-lex.europa.eu/eli/reg/2016/679/oj

Table 1. *Information Overview on Different Localities, Including Their Type, County, Number of Robberies, Population, Area in Square Kilometres, Ratio of Robberies per 1000 Inhabitants, and Ratio of Robberies per Square Kilometres*

County	Locality number	Locality	Locality type	Number of robberies	Population	Area [km²]	Robberies per 1000 inhabitants	Robberies per square km
City of Zagreb	101	Centar	Neighbourhood	18	34,268	3,02	0.525	5.968
	102	Medveščak	Neighbourhood	10	52,312	69,44	0.191	0.144
	103	Maksimir	Neighbourhood	27	51,626	14,97	0.523	1.804
	104	Peščenica	Neighbourhood	34	54,996	35,29	0.618	0.963
	105	Trnje	Neighbourhood	32	43,335	7,36	0.738	4.345
	106	Trešnjevka	Neighbourhood	75	124,390	15,64	0.603	4.794
	107	Črnomerec	Neighbourhood	8	39,858	24,18	0.201	0.331
	108	Dubrava	Neighbourhood	26	98,961	51,22	0.263	0.508
	109	Sesvete	Neighbourhood	13	70,868	165,22	0.183	0.079
	110	Novi Zagreb	Neighbourhood	76	131,542	206,50	0.578	0.368
	111	Susedgrad	Neighbourhood	14	97,831	48,40	0.143	0.289
Zagreb County	112	Bistra	Municipality	1	6,138	52,93	0.163	0.019
	113	Sveti Ivan Zelina	Town	1	13,729	185,94	0.073	0.005
	114	Brckovljani	Municipality	1	6,042	69,77	0.166	0.014
	115	Dugo Selo	Town	1	17,681	54,29	0.057	0.018
	116	Rugvica	Municipality	0	7,356	93,67	-	-
	117	Orle	Municipality	3	1,675	58,57	1.791	0.051
	118	Velika Gorica	Town	16	61,103	326,67	0.262	0.049
	119	Sveta Nedelja	Town	1	17,751	39,74	0.056	0.025
	120	Pušća	Municipality	0	2,445	17,03	-	-
	121	Vrbovec	Town	3	13,013	160,86	0.231	0.019
	122	Dubrava	Municipality	2	4,325	115,65	0.462	0.017
	123	Kloštar Ivanić	Municipality	0	5,485	77,45	-	-
	124	Ivanić-Grad	Town	2	12,369	173,52	0.162	0.012
	125	Jastrebarsko	Town	4	14,195	226,44	0.282	0.018
	126	Samobor	Town	1	36,181	251,46	0.028	0.004

DATA COLLECTION

This study is a part of the research project *Geographic profiling of robberies in the area of the City of Zagreb,* which has been carrying out since 2018, with the objective to investigate spatial patterns and related variables influencing the criminal path of robbers. The data on crime events and offenders were collected from the Criminal Intelligence Analysis Department of the MoI Criminal Police Directorate. In 2018, there were 369 reported cases of robberies, with 180 of them being solved. The data

include information on crime variables such as date, time, target, location, and means of usage for all robberies, as well as offender variables such as age, sex, education level, employment, and residency for solved robberies. Due to the aforementioned General Data Protection Regulation (GDPR), location information is available at the neighbourhood level. To improve the accuracy of robbery target locations, media data from the Ministry of Interior's website were used to obtain more precise locations for 252 criminal events, including either street or exact location details. For the remaining data, the mean centroids of population for each neighbourhood (Figure 2) was used as the location of the robbery. The location of residency for offenders was also taken at the neighbourhood level, and the mean centroids of population for each neighbourhood was used as their location. Feature extraction is performed in three phases. The first phase involves conducting geocoding, where coordinates of the robberies are pinpointed using the projected Croatian coordinate reference system (HTRS96-TM). In the second phase, crimes are categorized on the basis of various variables such as the type of robbery, target, location, and means of usage. Lastly, additional information about the offender and the geographic and socio-demographic variables of the area are incorporated into the solved robbery cases, including an offender's age, sex, education level, employment, residency, and the different statuses of the 20 police stations of the Police Directorate Zagreb for the study area.

Geographic and census data were collected from open sources such as the Open Street Map (OSM) for street routing and the Urban Atlas from Copernicus Land Monitoring Service for the census data for 2018. The services of the Copernicus program are widely used in the analysis, planning, prediction, monitoring, data review, and data management of land, atmosphere, climate change, marine environment, security (border surveillance and maritime traffic), and crisis situations (Batina, 2020).

DATA ANALYSIS

In 2018, Zagreb experienced a total of 369 robbery incidents. A detailed analysis was conducted to determine the most common methods used to commit these robberies, the primary targets, socio-demographic influences, the criminal paths, and the locations where the robberies occurred.

The GIS methodology used in this study involved creating layers and themes to analyse the distribution of robberies in different localities. GIS is a useful tool for analysing crime data from various perspectives and can help identify patterns and trends. Spatial data in GIS can be visually represented by using different thematic maps, such as heat maps (Roland, Šiljeg & Batina, 2017). Since robbery data may not be evenly distributed by the locality due to differences in population density and locality area, the study used the ratios of robberies per population and robberies per the area. The population data used for these calculations were from the 2018 Census conducted by Urban Atlas.

The analysis was carried out on the solved robbery cases, considering information about the offender, as well as the geographic and socio-demographic determinants of the area. The aim was to identify the patterns in these cases. Additionally, the street routing was conducted to determine the most likely path taken by an offender from their home to a target location. The purpose of reconstructing the criminal paths is to analyse their spatial relationship with the offenders' crime locations and their socio-demographic data (age, sex, education level, type of robbery, etc.). To generate these paths, the shortest path algorithm is used.

Street routing is important for understanding the movement of offenders who commit robberies and for the analysing journey to crime. Distance decay functions are used to analyse the typical patterns of offenders' movement. By calibrating these functions and implementing other parameters described in

this paper, a best fitted model can be created to predict offenders' residence more accurately (Butorac, Maurer & Gajski, 2021). However, the accuracy of the model can be reduced if the data used for spatial reconstruction are not properly calibrated, especially if there is a limited amount of input data (Gajski, Krtalić & Maurer, 2019). The results of this study are a starting point for further research of using distance decay modelling and calibration in this research project.

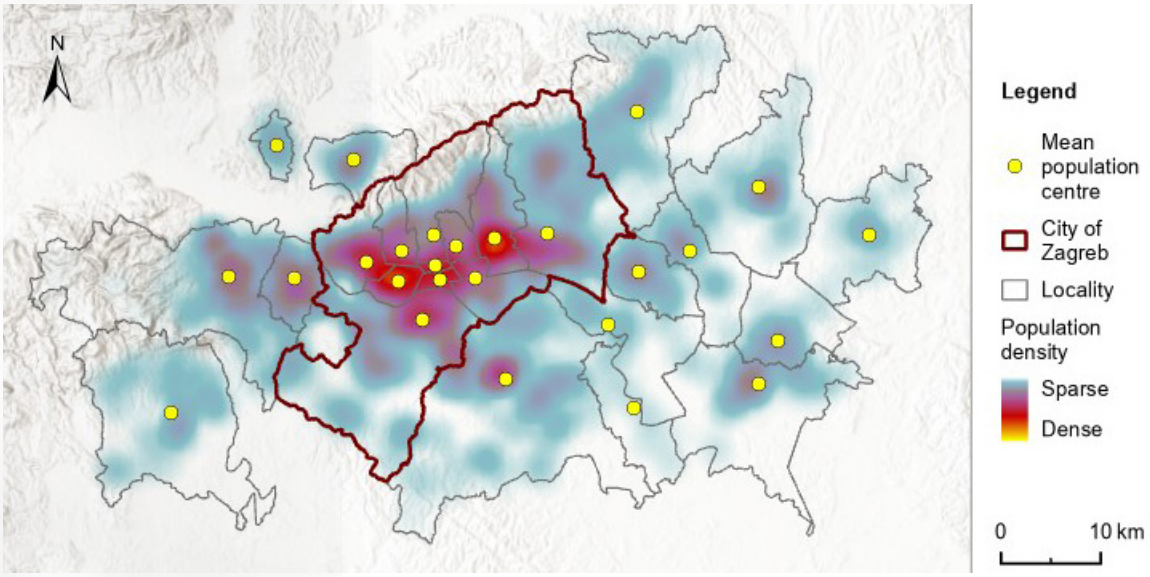


Figure 2. *The Population Density and the Mean Population Centroids for Each Neighbourhood*

FINDINGS AND DISCUSSION

Based on the analysis of available data, the means used for robberies and the primary targets of these crimes were highlighted. The relationship between the crime-related variables, such as the age of the offender and the means used, as well as the time of day of the crime and the travelled distance were examined. The study further analyses the frequency of robberies and the distance of criminal paths. The Street routing algorithm was employed to calculate criminal paths between the offender's residency and the target location. The distribution of criminal paths and the visualisation of all robberies in the study area are based on the performed analyses. Additionally, the study discusses the ratio of robberies per square kilometres and per population in the study area, as well as the use of a heat maps to identify higher crime areas.

CRIME SUMMARY ANALYSIS

In 2018, a total of 369 robbery incidents occurred in Zagreb. The most common mean of carrying out these robberies were the use of weapon, accounting for 49% of cases, followed by physical force at 31%, tools at 19%, and chemical substances at 2% (Figure 3). The primary targets of these robberies were individuals, accounting for 39% of cases, followed by stores at 26%, financial institutions at 9%, pharmacies at 7%, kiosks at 6%, gas stations at 5%, betting stores at 4%, hospitality facilities at 2%, and legal entities at 1% (Figure 4).

In 2018, a study was carried out on 180 solved robbery cases in Zagreb. The analysis revealed that the most common means used in these robberies were weapons, accounting for 45% of the cases. The physical force and tools were also frequently used, with percentages of 27% and 26% respectively, and chemical substances at 2% (Figure 3). The top targets for robbers are individuals (40%), stores (21%), pharmacies (11%), financial institutions (10%), kiosks (8%), betting stores (6%), gas stations (4%), and hospitality facilities (1%) (Figure 4).

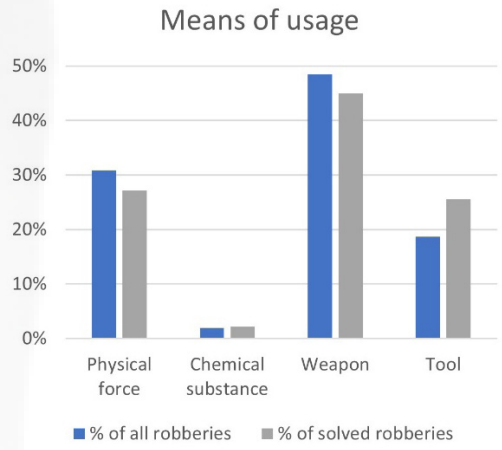


Figure 3. *Overview of Means Used for Robberies in the Study Area*

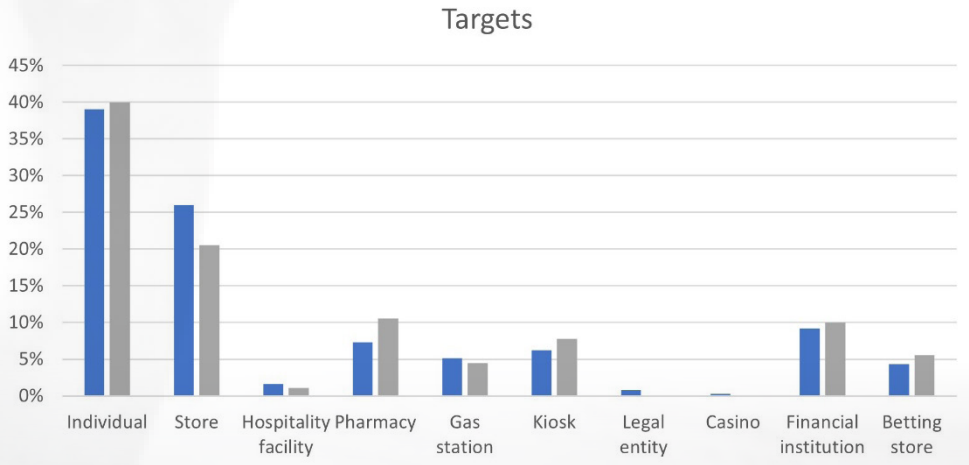


Figure 4. *Overview of Primary Targets of Robberies in the Study Area*

STREET ROUTING

The Street routing model was generated using Esri ArcGIS Pro 3.0. The model includes information about the road network, the locations of crimes, and offenders' residency. In reality the targets could be polygon shapes, but they are redefined as points for the purpose of generating paths (Iwanski et al., 2011). The model assumes that offenders travel in the direction of the target from their home location. As previously stated, offenders' home locations are geocoded as the mean centroids of population for each neighbourhood, due to the General Data Protection Regulation (GDPR), while the majority of target locations are geocoded to the exact location or street centroid, and the rest is geocoded

as the mean centroids of population for each neighbourhood. Paths were simulated using only road network, assuming that offenders choose the shortest routes (Figure 5). The road network data are obtained from an OSM dataset and encoded as a feature class within ArcGIS Pro. The dataset includes information about the road segments, such as coordinates, direction of travel, length, and type of road. The input also includes the offenders' home locations, the crime locations, and the type of crime.



Figure 5. *Street Routing Example Between Offender's Residency (Point 1) and Target Location (Point 2)*

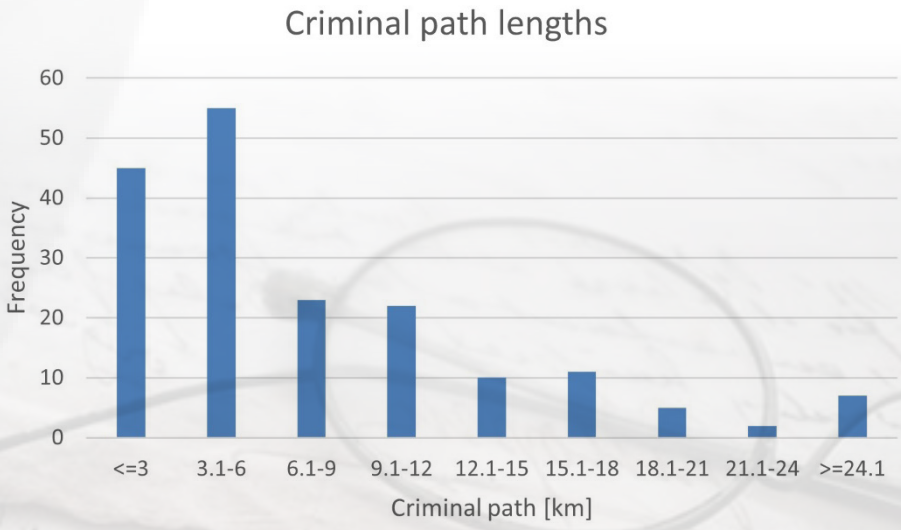


Figure 6. *The Distribution of Lengths of Criminal Paths*

The model focuses on crimes in the study area, with a total of 180 crimes. The presence of the distance decay effect was observed in the distance distribution of robberies committed by the offenders. Figure 6 shows that the frequency distribution of criminal path lengths decreases as the distance between the offender's residency and the target location increases. The median radius of all neighbourhoods in the City of Zagreb is 3 220 m, so the criminal paths are divided into classes of 3 000 m, as shown in Figure 6.

HEAT MAPS

This study used GIS methodology to analyse the distribution of robberies in different localities. Thematic maps were created to visually represent the number of robberies (Figure 7). Robbery density was calculated by dividing the total number of robberies by the area in square kilometres (Figure 8). Additionally, a robbery incidence rate was calculated by dividing the number of robberies by the population, expressed as % (Figure 9).

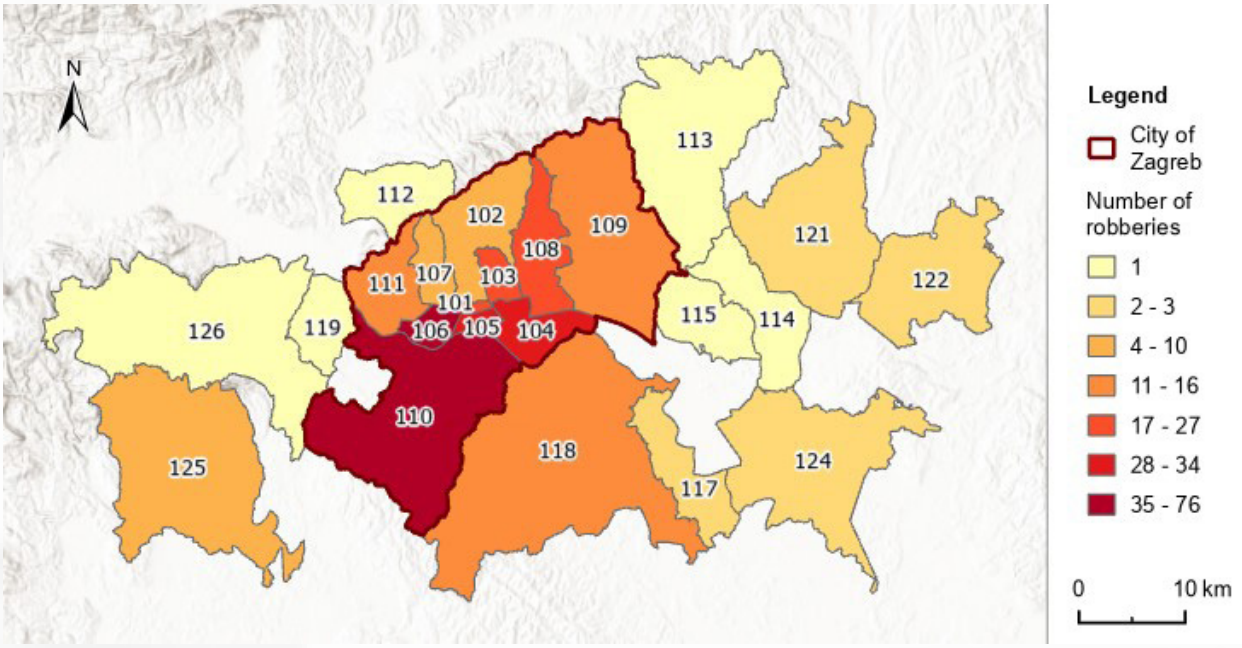


Figure 7. *Visualisation of All Robberies in the Study Area*

In 2018, there were a total of 369 robberies reported. The City of Zagreb had the highest number of robberies, with the majority occurring in the neighbourhoods of Novi Zagreb and Trešnjevka, following by neighbourhoods Trnje and Peščenica, as seen in Figure 7.

The density of robberies per locality can vary due to differences in the areas. Figure 8 shows the number of crime events per square kilometre, which indicates the density of robberies. The neighbourhood Centar has the highest density of robberies, which can be attributed to its status as the city centre and its economic, financial, commercial, and tourism activities. The neighbourhoods of Trešnjevka, Trnje, and Maksimir have a significant number of crime incidents and a high density. A study by Eman et al. (2013) found that robberies in Ljubljana and Maribor are also predominantly concentrated in the city centres and surrounding community districts.

Figure 9 displays the ratio of robberies per 1000 inhabitants in different localities. The Municipality Orle has the highest density of robberies, which can be attributed to its small population size com-

pared to the other areas. The neighbourhoods of Trnje and Peščenica have a high crime density per population. They are followed by the neighbourhoods Trešnjevka, Novi Zagreb, and Centar.

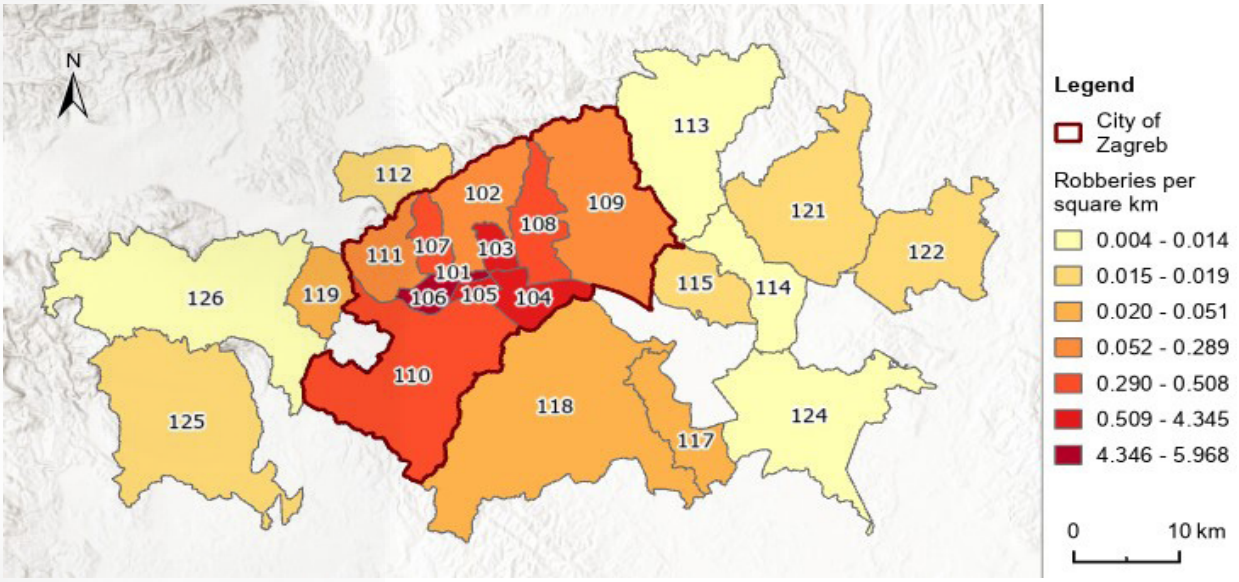


Figure 8. *Ratio of Total Number of Robberies per Square Kilometres in the Study Area*

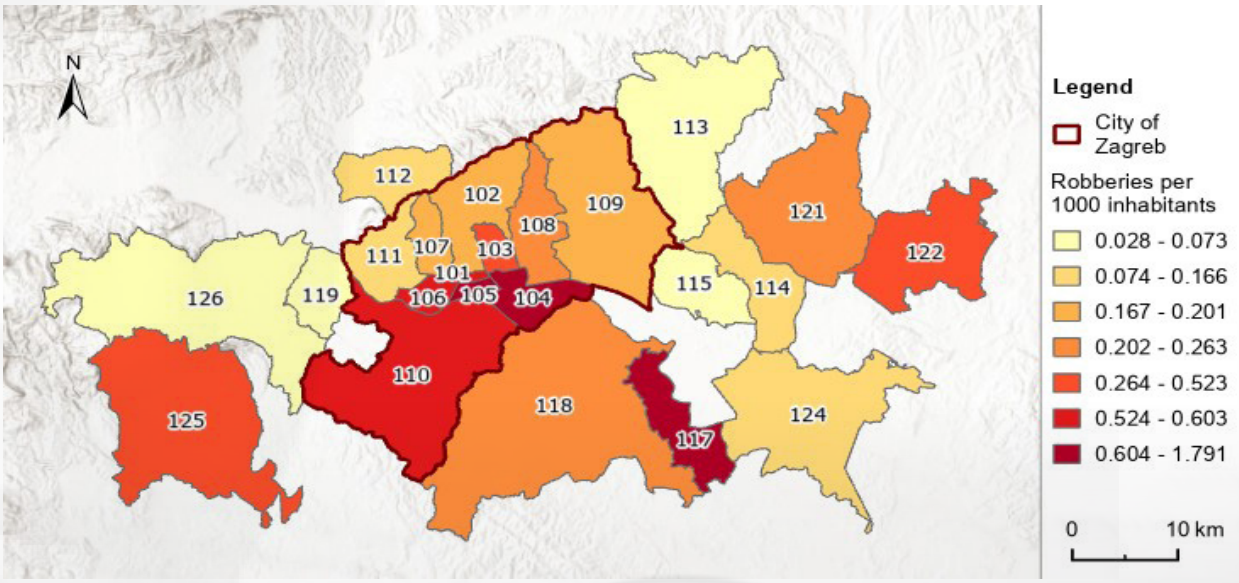


Figure 9. *Ratio of Total Number of Robberies per 1000 Inhabitants in the Study Area*

A heat map in Figure 10 displays the distribution of robbery locations in the City of Zagreb. The study found that the downtown area has the high number of robberies due to its economic, financial, commercial, and tourism activities. As seen from Figure 7 – Figure 10, there is a high robbery rate in the parts of neighbourhoods Novi Zagreb, Peščenica, Trnje, and Trešnjevka surrounding the downtown area. The data shows higher number and density of robberies in the neighbourhoods of the City of Zagreb, while the towns and municipalities in the Zagreb County has lower numbers of robberies.

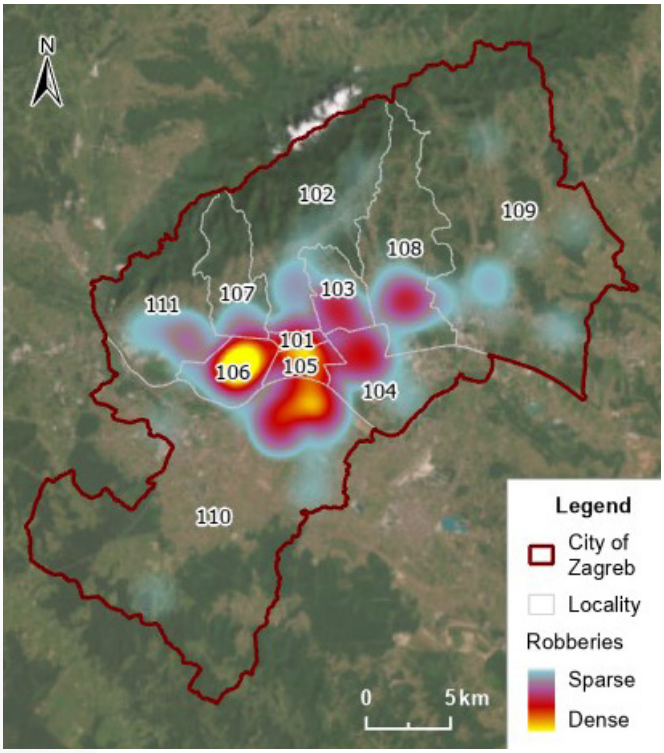


Figure 10. *A Heat Map Showing the Locations of Robberies in the City of Zagreb*

ROBBERY PATTERN ANALYSIS

The data collected on offenders include their age, sex, marriage status, education level, and resident location at neighbourhood level. However, there is missing information of the education level for about 30% of the offenders, and there are only 15 female offenders out of the total 180. Therefore, the analysis focuses on the age of the offenders. The data are divided into age groups, and the frequency of occurrence of the travelled distance (Figure 11), target (Figure 12), means of usage (Figure 13), and time of day of the crime (Figure 14) are analysed for each age group.

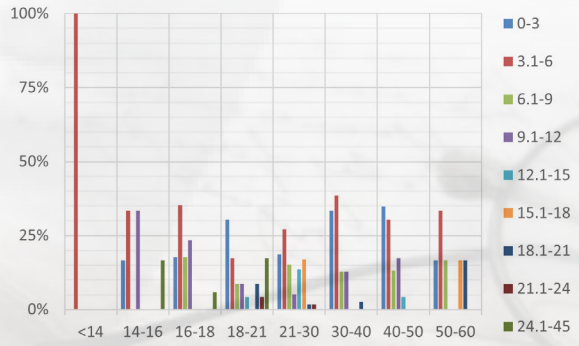


Figure 11. *Distribution of Robberies by Age Group of Offenders and the Travelled Distances (km)*

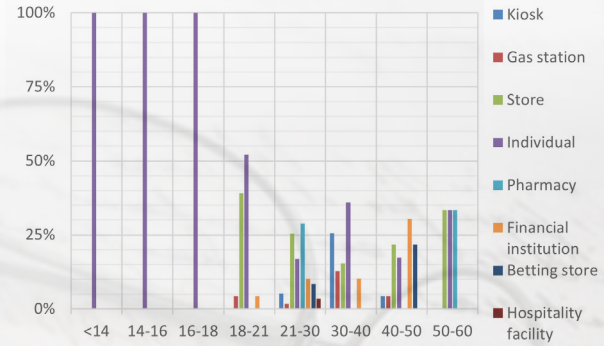


Figure 12. *Distribution of Robberies by Age Group of Offenders and Their Targets*

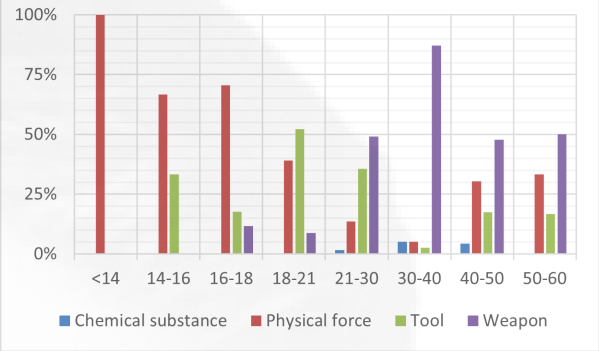


Figure 13. *Distribution of Robberies by Age Group of Offenders and the Means of Usage*

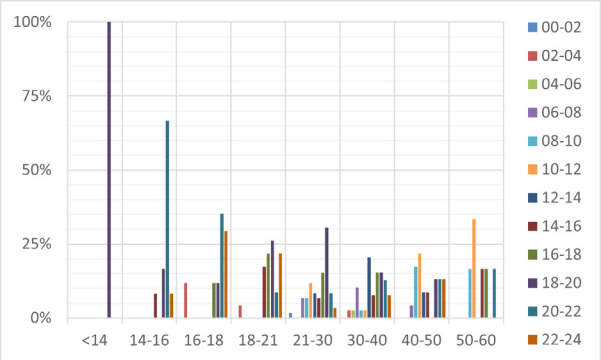


Figure 14. *Distribution of Robberies by Age Group of Offenders and the Time of Day*

The data indicate that the most common distance travelled by criminals of all age groups is between 0-3 km and 3,1 - 6 km (Figure 11 Distribution of robberies by age group of offenders and the travelled distances (km)). Specifically, for individuals aged 18-21 years and 40-50 years, the most frequent distance travelled is up to 3 km. However, for the other age groups, the most frequent distance is between 3,1 and 6 km.

The data show that 40% of all attacks are on individuals (Figure 12 Distribution of robberies by age group of offenders and their targets). The age group up to 18 years only uses physical force and targets individuals. The age groups from 18 to 21 years and from 30 to 40 years are the most likely to attack individuals, accounting for 52% and 36% of cases, respectively. The age group from 18 to 21 years also has a significant number of attacks on stores (39%), while the age group from 30 to 40 years targets kiosks in 26% of cases. The age group from 21 to 30 years primarily attacks pharmacies (29%) and stores (25%). In contrast, the age group from 40 to 50 years primarily targets financial institutions (30%), followed by stores and betting stores (both 22%). The oldest age group, from 50 to 60 years, evenly attacks individuals, pharmacies, and stores (all 33%).

The most commonly used means of attack are weapons, accounting for 45% of cases, followed by physical force at 27% and tools at 26% (Figure 13). Physical force is most commonly used by offenders up to 18 years of age. Between the age of 18 and 21, the majority of attacks involve the use of tools in 52% of cases. For offenders aged 21 an older, weapons are the most commonly used means of attack. In the 21 to 30 age group, 49% of attacks involve weapons, while tools are the second most commonly used means, accounting for 36% of cases. From 30 to 40 years old, weapons are used in 87% of cases. For the age group from 40 to 50 years, weapons are still the most commonly used means of attack, followed by physical force at 48% and 30%, respectively. In the age group of 50 to 60 years, weapons are most commonly used in 50% of cases, followed by physical force at 33%.

The majority of robberies occur between 18 and 22 hours (Figure 14). The research by Milojković and Petrović (2019) also found that the critical time for retail establishments is at night, near closing hours, when street activity is significantly lower. The specific time frames in which attacks are most common vary depending on the age group of the offenders. Offenders up to 14 years of age commit their attacks between 18 and 20 hours. Offenders between 14 and 16 years of age commit their attacks between 20 and 22 hours (67%). Offenders between 16 and 18 years of age primarily attack between 20 and 22 hours, as well as between 22 hours and midnight (35% and 29%, respectively). Offenders between 18 and 21 years of age mainly attack between 18 and 20 hours (26%), as well as between 16 and 18 hours (22%). Offenders between 21 and 30 years of age have a higher frequency of attacks between 18 and 20 hours (31%), followed by between 16 and 28 hours (15%). The age group between 30 and 40 years

tends to commit robberies mostly between 12 and 14 hours (21%), as well as between 16 and 18 hours and 18 and 20 hours (15% each). The age group from 40 to 50 years tends to commit robberies mostly between 10 and 12 hours (22%) and 8 and 10 hours (17%). The age group from 50 to 60 years tends to commit robberies mostly between 10 and 12 hours (33%). Milić (2015) found that the robberies are most frequently committed during the morning hours, particularly between 9 and 11 a.m., in identified hotspots. It has been concluded that the criminal acts of robbery are most often committed by the perpetrators at the beginning and at the end of working hours, anticipating fewer people present.

The data are organized into targets, which are further categorized by type. The analysis focuses on three factors for each target: the distance the offender travels to reach the target (Figure 15), the time of day when the crime occurs (Figure 16), and the means used by the offender (Figure 17).

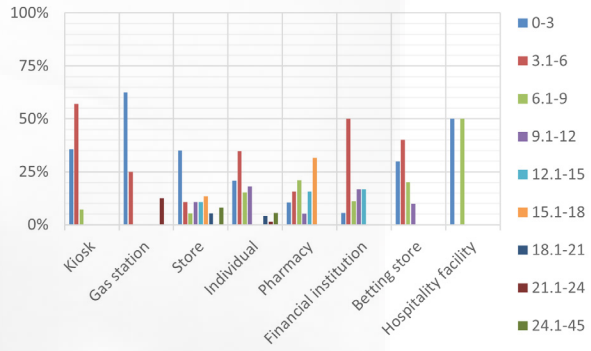


Figure 15. *Distribution of Robberies by the Target and the Travelled Distances (km)*

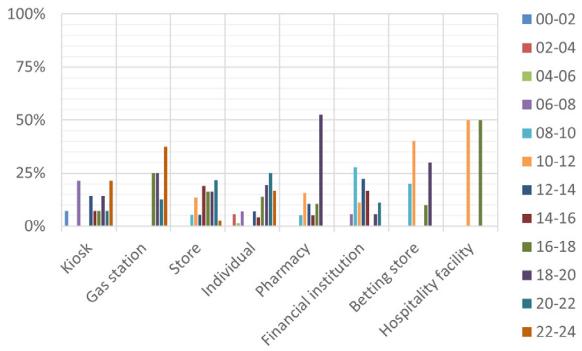


Figure 16. *Distribution of Robberies by the Target and the Time of Day*

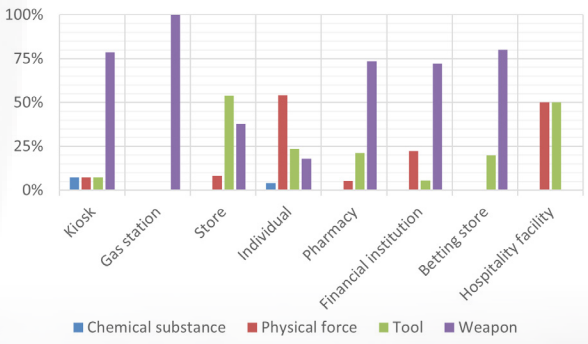


Figure 17. *Distribution of Robberies by the Target and the Means of Usage*

The data show that the most common length of the offenders' criminal path for the target is between 3,1-6 km in 31% of cases, followed by the distance range of 0-3 km in 25% of cases (Figure 15). The offenders travelled up to 3 km to gas stations in 63% of cases, to kiosks in 36% of cases, and to stores in 35% of cases. The most frequent length for kiosks is between 3,1-6 km in 57% of cases, for financial institutions in 50% of cases, and for betting stores in 40% of cases. When the target is a hospitality facility, the frequency of occurrence is divided between 0-3 km and 6,1-9 km, each accounting for 50% of cases.

The analysis reveals that the most frequent times of a day for different types of targets are between 16 and 22 hours (51% of all robberies) (Figure 16). For pharmacies, the majority of robberies occur between 18-20 hours, accounting for 53% of cases. For gas stations, the most common time of day for robberies is between 22 and midnight, representing 38% of cases. Additionally, 25% of cases occur between 16-18 and 18-20 hours. For betting stores, the highest frequency of robberies is observed

between 10-12 hours, accounting for 40% of cases. This is followed by 30% of cases occurring between 18-20 hours and 20% of cases occurring between 8-10 hours. Robberies at stores are spread throughout the day, with the most frequent time of day being between 20-22 hours in 22% of cases. The attacks on individuals are also most frequent during this time, accounting for 25% of cases. The remaining cases are divided throughout the day, with the majority occurring between 14 and midnight. However, there are exceptions, with 6% of cases happening between 2-4 hours and 7% of cases occurring between 6-8 hours.

The most frequently used means of attack is a weapon (Figure 17), with 100% of cases involving gas stations, 80% involving betting stores, 79% involving kiosks, 74% involving pharmacies, 72% involving financial institutions, and 38% involving stores. When the target is an individual, the most frequently used means is a physical force in 54% of cases, followed by a tool in 24% of cases, and a weapon in 18% of cases. Physical force is used in 22% of cases for financial institutions, and in 50% of cases for hospitality facilities, where a tool is also used in 50% of cases.

ORIGINALITY/VALUE

This paper presents the results of the first research project on geographic profiling in Croatia. It emphasises the environmental features of the robberies and criminal behaviour characteristics of the robbers which are specific for the area of the City of Zagreb as an initial step of the model development. The research paper builds on the existing knowledge of the topic and addresses possible implications for future development of the spatial crime models in Croatia. The distance distribution covered by perpetrators of robberies shows the presence of the distance decay effect. There is also a certain positive relationship between both the crime-related and the offender-related variables such as the age of the offender and the means of usage, as well as the time of day of crime incident. The frequency of occurrence of the crime in relation to the distance and temporal component indicates a trend of shorter distances in the night and morning hours, while there is a greater variation in distance during the day, which may be connected to the mobility of the offenders, especially those who use public transportation. The data collected from the Croatian General police directorate for the study area have some limitations, particularly in terms of both insufficient spatial information and offenders' characteristics. For the more plausible results more accurate spatial data on the crime locations, as well as the locations of the offender's residence, and homogeneous socio-demographic data on offenders ought to be provided by the police.

Geospatial data processing technology is used to analyse crime patterns and connections between socio-demographic, spatial, and temporal features. The researchers used the street routing algorithm on road network to reconstruct the routes taken by the offenders to their crime locations. The research emphasises the significance of geostatistical methods in crime analysis, particularly in identifying crime occurrence through heat map analysis. The study suggests that understanding the relationship between the offenders' activity spaces and crime locations could help identify perpetrators and contribute to crime reduction. It is advisable to discuss potential improvements to the model and suggest extending the analysis to other cities and crime types. Likewise, the possibility of incorporating factors like public transport network into the model to account for the dynamic nature of a city road network should be discussed. Overall, the study aims to provide the relevant insights for criminologists, police, and policymakers to focus on the key areas frequented by the offenders. The crime analysis can enhance public safety, to identify trends, and plan crime-prevention strategies. Law enforcement can

optimize resource allocation, solve cases, and implement effective crime-reduction strategies. The basis for geographic profiling is the study of criminal path.

A study by Strmečki and Majer (2022) carried out in Croatia found that despite the usefulness of GIS in the police work, 80% of the 266 police officers surveyed had no education in GIS. However, 74% of them recognized the value of geographic profiling in criminal investigation. This highlights the need for further research on the geography of crime in Croatia including the implementation of GIS. The study findings will be also beneficial for research, particularly in calibrating distance decay functions to understand offenders' movement by the example of the City of Zagreb and Zagreb County.

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MODERN CRIMINAL INTELLIGENCE IN HIGHER EDUCATION TRAINING AND PRACTICE

Peter Nyeste, PhD[1]
Faculty of Law Enforcement, Ludovika University of Public Service, Budapest, Hungary

INTRODUCTION

In the criminal context, the word 'intelligence' means the discovery of acts or events that are concealed or otherwise latent, relevant to the crime, the clarification of unknown circumstances or details, and the making known of these to others for the purposes of further proceedings and action (Boda, 2019). It was only in the 18th century that the activities of law enforcement authorities in the field of criminal intelligence and investigative support began to develop in Europe, following the French model of Eugene Francois Vidocq's secret police in Paris. As with military and national security intelligence, domestic criminal intelligence gradually developed separate, specialised organisational elements, human and technical resources and a methodology and intelligence model.

More than a hundred years have passed since the establishment of the Hungarian Detective Corps until the change of regime, and the nature and character of crime and criminal offenses have changed significantly, but the circumstances underpinning confidential information (e.g. victimlessness, organized crime) have not changed. These circumstances continue to justify collecting information and recording data without the knowledge of the party concerned, using appropriate external control.

The purposes and means of criminal intelligence and investigation are also different. The criminal intelligence assumes that the crime has not yet begun, that crime must be known and prevented, and the dangers of crime must be known as a current threat. The investigation is aimed at getting to know the suspicious behaviour that took place in the past, reconstructing the facts, and establishing the identity of the perpetrators. The main tools of the investigation are the open means of proof, the purpose of which is to reveal the illegal acts that have taken place in the past, to reconstruct the facts, and to gather evidence.

After a long preparatory work, The Act on the Police was adopted in 1994, regulating the secret gathering of information for "criminal purposes" in a separate chapter (VII.), which became a new, legal-level name for the activities called earlier "covert confidential procedures" and later in the Soviet era "secret operational tools and methods". With this, the prevention, detection and proof of crime have gained new, available, legally regulated opportunities, with little external control.

Criminal proceedings did not regulate, but allowed the use of secretly obtained information in criminal proceedings. Although this activity has been authorized by law, this has been regulated in detail in internal standards and instructions. The open and secret components of the knowledge have rightly given rise to a kind of segregation, as the collection of secret information as an option is not secret from the public, but the detailed regulation and the specific application remained secret, and this was accompanied by restrictions on confidentiality (Szendrei, 2020).

1 nyeste.peter@uni-nke.hu

Learning about the theory behind the use of covert investigative tools and how to use them effectively can be of great help in disrupting and preventing current and future crimes, and can add to the catalogue of evidence tools.

PURPOSE

The aim of the article is to present the teaching of criminal intelligence in law enforcement higher education, as well as to present the practice developed in the new legal environment.

DESIGN/METHODS/APPROACH

The author presents and examines the legal framework and practical aspects of the operation of Criminal Intelligence in Hungary and the situation of training, with special regard to the new Criminal Procedure and Police Law.

FINDINGS

Findings: On the one hand, analysis of the domestic legal regulation of criminal intelligence and the relevant EU recommendations the subject of the critical review, and on the other hand, the analysis of the development of criminal intelligence training in the domestic law enforcement higher education. The development of domestic training follows legislative changes, but the uniform application of criminal intelligence in practice needs improvement.

ORIGINALITY/VALUE

The article can contribute to the uniform practical and training application of criminal intelligence. The monitoring of changes in established practice can be the subject of further articles.

THE NEW LEGAL REGULATION OF CRIMINAL INTELLIGENCE

Criminal Procedure Law

In 2018, the time has come to transform the domestic criminal intelligence system and legal bases in order to ensure the continuity of supervision and investigations, prevent the loss of information and strengthen the law. The new Criminal Procedure Act, which entered into force on 1 July 2018, changed the law enforcement model according to which the tasks of criminal intelligence remained in the Police Act, the National Tax and Customs Administration Act and the Prosecution Act. The covert methods for criminal investigation purpose are set out in the Criminal Procedure Act.

The established system of procedures ensures the possibility that proactive, early detection can be applied within a short period of time before ordering an investigation, but already within the framework of criminal proceedings (Nyeste & Szendrei, 2019).

This has made it possible to avoid the practical problem of law enforcement arising from the separation of the regulation of secret information gathering out of criminal proceedings and in the framework of criminal procedure. And the acquisition of secret and other data in the framework of criminal proceedings was regulated separately from the secret information gathering of law enforcement agencies. The established system of procedures ensures the possibility to apply proactive prior detection in a short period of time before ordering an investigation, but already in the framework of criminal proceedings in order to establish or exclude the suspicion of criminal offenses (Nyeste & Szendrei, 2019).

The new procedural system - according to the law's explanation - creates the possibility of applying a proactive surveillance within a short deadline (6 months or some cases 9 months) before the criminal proceedings be initiated but within the framework of the criminal procedure. The new Criminal Procedure Act called this phase preliminary proceedings. The aim of this proceeding is to ascertain or exclude the suspicion.

The new Criminal Procedure Act creates the possibility of carrying out this activity in the course of criminal proceedings in order to establish suspicions, and in order to avoid the exclusion of evidence that does not fulfil the condition of "immediacy" in the criminal proceedings. During the preliminary proceedings, only those covert and open investigative measures could be used that do not yet assume the suspicion of a crime and the Prosecutor exercises supervision of preliminary proceedings. After this phase, under the investigation all of the special investigation measures can be done.

Special investigative means in criminal proceedings are those related to the detection and proof of criminal offenses, which are carried out without the knowledge of the person concerned are partly similar to the secret information gathering means. Techniques whose existence presupposes a suspicion of a criminal offense can only be used in criminal proceedings, etc. decoy or investigative bargain. Under previous regulations, the trap could also be used in secret information gathering procedure, for example.

This concept is compatible with the European Union's recommendation, according to which special investigation techniques (SIT) are applied by competent authorities in the context of criminal investigations for the purpose of detecting and investigating serious crimes and suspects, aiming at gathering information in such a way as not to alert the target persons. As the name suggests SITs are such proactive investigative methods that give the opportunity to the investigator to detect, ascertain or exclude the suspicion (Recommendation Rec (2005)10).

And the domestic concept compatible with the Project of Criminal Asset Recovery in Serbia of the Council of Europe includes those means or techniques used to gather evidence and/or intelligence and information in such a way (covertly) that they do not alert those being investigated. Invariably their deployment will involve a breach of the right to a private life, which will have to be justified by those carrying out/authorising the operation (Council of Europe Office in Belgrade, 2013).

The Special investigative measures regulated in the Criminal Procedure Act are as follows:

Not subject to judicial authorization:

- Informant
- Surveillance
- Disinformation
- Trap, decoy
- Covert information gathering
- Replacement of the victim or other person

Prosecutor's authorization:

- Covert investigations
- Controlled deliveries
- Pseudo purchase
- Plea/investigative bargaining
- Monitoring of payment transactions
- Monitoring with consent (victim)

Judge's authorization:

- Interception of communications
- Interception of post
- Wiretapping,
- Secret search
- Remote searches and bugging

Police Act

With limited facilities, law enforcement (or law enforcement support) and crime prevention purposes, the regulation of sectoral laws still allows for the secret information gathering. The Police Act defined the concept of secret information gathering: the secret information gathering is a special activity carried out by the police without the knowledge of the person concerned, involving the restriction of the fundamental rights to privacy, the private home and the secrecy of correspondence and the protection of personal data.

Pursuant to the Police Act, the possible purposes of collecting secret information are: crime prevention, sting operation, circling procedure, provision of personal protection, preparation and implementation of the Protection Program, personal protection and facility insurance tasks, placement and removal of technical equipment or data used in the application of covert means subject to judicial authorization, in the framework of cooperation with a Member State of the European Union or a third country under the law or international agreement on international law enforcement cooperation, in order to protect a covert investigator or covert organization, recruiting and protecting an informant.

Possible means of secret information gathering (that is not linked to a specific crime) include:

Not subject to judicial authorization:

- use of informant;
- collecting and verifying information by keeping the real purpose of the proceedings secret and by using a police officer or undercover detective;
- secret observation of a person, an apartment, another room, a place open to the public, or a vehicle, collecting information about what has happened and recording what has been detected by technical means;
- replacing a person with a police officer if necessary in order to protect his or her life and physical integrity;
- obtaining the data necessary to establish the fact of communication by an electronic communication device or information system, to identify the electronic communication device or information system or to establish its location;

– requests for data from service providers designated with the permission of the public prosecutor;

Subject to judicial authorization:

– secret search,
– secret surveillance of a private home,
– confidential access to the consignment,
– wiretapping,
– secret monitoring of an information system.

The law enforcement concept change of 2018 took into account international patterns and the Police Act in its preventive tasks in criminal intelligence uses a stepwise approach. In general, the law stipulates that - among the tasks of the police - what is meant by crime prevention implies police activities in general. The crime prevention task does not only apply to the criminal intelligence activities of the police, but also to all types of tasks that enable the implementation of crime prevention objectives (e.g. detection of public order disturbance, traffic police patrols).

In order for the goal set by law to be achieved, it defines the intelligence (not just criminal) needs at the organization level, their priorities (this can be one of the tasks of the daily command instructions), and their implementation must be continuously monitored and if necessary, modified tasks need to be followed by an appropriate analysis. The general crime prevention task definition is followed by a set of criteria for the applicability of secret information gathering, which sets out the conditions under which secret information gathering may be carried out for the purpose of crime prevention. The final step in the regulation concerns the applicability for criminal prevention purposes of the most severely restricted means of gathering information subject to judicial authorization.

CRIMINAL INTELLIGENCE TRAINING IN HIGHER EDUCATION

Ludovika University of Public Service (Ludovika - UPS) is the only higher education institution in the Hungarian education system where criminal intelligence is taught in a complex way. The majority of law schools naturally deal with the regulation and legal basis of covert means used in criminal proceedings, but their topics do not cover practical implementation and methodological issues. They also do not deal with criminal intelligence under the Police Act.

Students at the Law Enforcement Faculty are offered four-year full-time and three-year part-time BA programs, two-year part-time MA programs, three-term specialised further training courses, and also a four year long doctoral program.

Two of the Ludovika - UPS's Bachelor's degrees (BA) offer a total of three specialisations in criminal intelligence. Each of these courses includes an integral part of the three-semester course "Criminal Police Service Studies" and additional courses depending on the specialisation chosen.

In addition to the Bachelor's degree (BA), students must also complete 4 weeks of compulsory professional training after the academic year, which is related to the chosen specialisation and can be completed at the body that is appropriate to it.

In the Ludovika - UPS's Master programs in Law Enforcement Leadership Management (MA), the four-semester Leadership Studies for Criminal Police specialisation and the Master of Criminalistics Master program are concerned with criminal intelligence. Among the NKE's courses, we should also mention the three-semester "Law Enforcement Organiser", which is a retraining course, and the

two-semester "Theory and Practice of Combating Organised Crime", which was launched at the university in 2018. The latter will provide practising judges, prosecutors and members of the investigating authorities with an additional opportunity to learn more about the possibilities of fighting organised crime, including lectures on criminal intelligence.

Further training and development opportunities are also provided by the Doctoral School of Law Enforcement at the Ludovika - UPS, where several research topics (e.g. "Intelligence gathering for law enforcement purposes and covert means" or "The criminology of intelligence gathering") are also related to criminal intelligence.

The professional conduct of criminal intelligence is an essential prerequisite for adequate preparation. The specificity of law enforcement training is that it requires students to be trained in an activity that is based on law, but also regulated in detail by restricted internal standards. This limits the scope of the technical concepts of conspiratorial activity that can be taught, so that training at school level, whether at BA or MA level, cannot cover all the details. For this reason, in addition to school-based training, there is a special role for further training and education within the law enforcement organisation, which, however, must be carried out alongside professional work; both for instructors and students.

The correspondence and full-time BA courses are available in 6 and 8 semesters respectively. The correspondence courses are open to law enforcement personnel, while the full-time courses are typically open to civilian graduates from secondary school. A new initiative is the possibility of opening a full-time course for talented non-commissioned officers, with classes of 15 to 18 students starting with non-commissioned officers already in the field of law enforcement and criminal justice.

In the BA criminal specialisation, both full-time and part-time, the course "Criminal Police Service Studies" provides the basic knowledge of criminal intelligence. However, criminal intelligence is not only taught to students in the criminal specialization, but also to other specialisations, such as the border police, traffic police, administrative police and public order protection, in the core subject "Criminal Investigation Studies".

In order to meet the needs of law enforcement organisations, a human intelligence BA specialisation has been available on a correspondence basis for several years. This training is open only to police officers with at least 3 years of field experience and national security clearance. The students learn the importance of human source intelligence, the potential sources they will be able to use, the rules and recommendations of selection, background-checking and recruiting sources in practice. They learn the communication and psychological background of human source intelligence, the rules of covert contact. This special knowledge can help increase the effectiveness of criminal intelligence.

The parts of the theoretical instruction that are more difficult to understand are typically mastered during the practical sessions, which are more focused in the second semester, such as a full-day surveillance exercise with the assistance of the Special Service for National Security, the use of specific tools, or the complete processing of a concrete (but fictitious) case, including planning, administration and execution. Both these practical exercises and the third semester lectures (which cover the possibilities of detecting certain types of crime) are carried out with the help of experts invited from the field.

In our experience, the number of student feedbacks about inconsistencies between theory and practice is decreasing year by year. There is an increasing convergence between the taught curriculum and the applied practice, which is confirmed by the satisfaction of the senior police officers and police managers who took part in the exercises and final examinations.

Our higher education has responded to the growing number of crimes committed in the online space. We have launched a new BA specialisation in cybercrime investigation 4 years ago based on the needs of the police. Some characteristic subjects of the cybercrime investigation specialty include: infocommunication tools, basics of information security, infocommunication networks and telecommunication systems, criminological characteristics of cybercrime, criminal law features of cybercrime, cyber investigator work in the field, open and secret information gathering in cyberspace, aggression and sexual deviances in cyberspace, investigation of intellectual property crimes in cyberspace, investigation of financial crimes in cyberspace, organized crime in cyberspace.

From August 2024, the Law Enforcement Faculty of the Ludovika University will have a separate Cybercrime Department. The Department will include specialised classrooms and specific analytical programmes.

TRAINING AND CRIMINAL INTELLIGENCE MODELS IN PRACTICE

The central training of the body set up to carry out general policing tasks is organised and implemented by the Rapid Response and Special Police Service, but in recent years the capacity of these training courses has been significantly reduced. Instead of 100-120 persons being trained annually in three modules at three levels, they can now only accommodate 30% of the former number of staff in intermediate level training.

In the regional and local bodies, training is largely limited to the transfer of up-to-date theoretical knowledge, but training for practical application has almost disappeared. Typically, the lack of experienced professionals, turnover in the field of intelligence and understaffing result in a lack of training of sufficient quantity and quality, but the organisational structure, which is not yet adapted to the new rules created by the new Regulation, also has a negative impact (Csizner, 2024).

The police's organisational level solutions for criminal intelligence present a very varied picture. In the international literature, many studies have examined different policing models, describing their advantages and disadvantages. Problem-oriented policing (Herman, 2003) can help to better understand criminality rooted in social processes and to predict trends and changes, but information can only be obtained through close cooperation and serious analytical work. Intelligence-led policing shares many of the characteristics of the above strategies, but differs from them in some respects (Tilley, 2003). Intelligence-led policing has been used successfully to tackle major crime problems as they arise, but is not in itself effective in identifying new patterns and processes of crime and formulating responses (Maguire, 2008).

Community policing is one of a number of policing theories that were developed as a policing concept and strategy in the USA and then transferred to Europe in the 1980s (Skogan, 2004). The basic idea of community policing is to decentralise the police closer to local communities, to increase police visibility in public spaces and to involve the community in the definition of the problems they face. Community policing is preventive rather than reactive, as the main aim is to increase the public's sense of security (Jaschke, et al., 2007). However, the crime-reducing effect of increased police presence alone cannot be conclusively demonstrated (Bradford, 2011). Some studies suggest that a 10% increase in police presence may have a 3% crime-reducing effect on low-value property and related crime, but the effect on violent crime is no longer clearly demonstrated (Levitt, 1997). The effectiveness of community policing, the acceptance of policing measures and the development of partnerships with the public

may be hampered by the variation in the ethnic composition of the population and their different cultural attitudes (Bottoms & Tankebe, 2012).

Based on the analysis of the above-mentioned documents, the basic steps for the development of criminal intelligence capabilities are the establishment of an appropriate organisational element (criminal information unit), the selection of specialists and professionals for each job, continuous training, education, provision of human, material and technical resources, dissemination of intelligence awareness and intelligence priority points within the organisation.

In domestic practice, both under the previous legislative framework and under the current legislation, different specific intelligence organisation models have been applied. The Directorate General of Criminal Investigation of the National Tax and Customs Administration has developed its criminal intelligence model (e.g. use of a controller, employment of only ad hoc informants at local level, etc.) for several years, in line with the specialities of the field and taking into account international experience.

The National Bureau of Investigation of the Rapid Response and Special Police Service and the Budapest Police Headquarters, as larger units with concentrated criminal tasks, use mainly specialised integrated intelligence units (human intelligence, analysis, case processing), which are separated at organisational level.

The intelligence gathering tasks of criminal intelligence are carried out by the intelligence units of the police, but the use of covert means is already carried out by other organisational elements in several territorial services (e.g. economic protection, criminal investigation department) and the relevant analyses are also carried out by other organisational elements. There are also organisational arrangements whereby the territorial bodies also meet the criminal intelligence needs of the local bodies, but there are also examples of operations requiring more resources and manpower being carried out jointly by the criminal intelligence units of the territorial bodies with the local bodies. In other words, there is no single integrated criminal intelligence model that is adapted to local specificities. Yet in response to the emerging trends in cybercrime, specialised cyber investigation units have been set up in the police force, with 300 officers.

CONCLUSIONS

The legal basis for the development of modern criminal intelligence in Hungary is in place. Reforms in the 2018 Criminal Procedure and Police Act can support criminal intelligence and investigation adequately. The law enforcement higher education curricula have responded appropriately to the legislative changes. The use of more hours of practical sessions could, of course, further enhance the proper application of theoretical curricula in practice.

The learning of criminal intelligence through training in law enforcement agencies is mixed and the models of criminal intelligence are not uniform. Police professional management does not show a consistent picture either.

On the basis of the above, I recommend that law enforcement agencies should hold more criminal intelligence training courses with a larger number of participants, more hours and a uniform theme. Furthermore, I would consider it necessary to set up train-the-trainer courses, even at our universities. The development of an effective, coherent, but at the same time organisationally tailored, integrated criminal intelligence model, following the same enforcement, case processing and control protocols,

and its development at the organisational elementary level, remains a challenge for police researchers and the criminal intelligence branch of the police.

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DETECTING DEPENDENCIES IN DATAFLOW KERNELS

Nenad Korolija, PhD[1]
School of Electrical Engineering, University of Belgrade, Serbia

Anton Kos, PhD
Faculty of Electrical Engineering, University of Ljubljana, Slovenia

PURPOSE

The importance of artificial intelligence in detecting crime cannot be overstated. It is used in detecting social engineering attacks (Brkić, 2023), speech recognition and enhancement (Perić, Bogdanoski & Maček, 2022; Popović, 2023), but it is also capable of detecting persons (Hangaragi, Singh & Neelima, 2023; Naik, Kaur, Yathiraju, Das & Pant, 2023), tracking them (Han et al., 2023), and performing complex tasks necessary in detecting crimes (William et al., 2023). The need for artificial intelligence algorithms is constantly rising (Bharadiya, Thomas, & Ahmed, 2023). There are many artificial intelligence algorithms. The common feature of all of them is that they are known to be computation demanding (Zhang, Zhu & Su, 2023). As a result, the execution of artificial intelligence algorithms is often performed in modern cloud infrastructures using dedicated hardware.

Control-flow (CF) architectures are based on the von Neumann computing paradigm. Control-flow architectures execute program instructions in a sequential manner based on the program written by a programmer or programmers. Program usually includes control structures such as conditionals and loops, as well as function calls. These structures allow programs to make decisions, repeat tasks, and organize code into modular units, enabling more complex and flexible behavior. In control-flow architectures, instructions are executed one after the other, following the linear order specified by the program. This sequential execution model is based on the notion of a program counter that points to the next instruction to be executed. Control-flow architectures include branching and jumping mechanisms, allowing programs to alter the sequential flow of execution. Conditional branches allow making decisions in run time based on certain conditions, directing the program's flow. Jump instructions, such as 'goto' in low-level languages, enable non-sequential transfers of control. Many programming languages, such as C, Pascal, and Python, adhere closely to control-flow architectures, emphasizing procedural programming styles where instructions are organized into procedures or functions. In this approach, functions serve as building blocks for modular and reusable code. Control-flow architectures typically exhibit sequential consistency. In other words, instructions are typically executed in the order they appear in the program code, ensuring deterministic behavior. However, many modern architectures employ optimizations that can alter the order of execution of instructions. Also, pipelining is introduced to improve performance while maintaining the illusion of sequential execution from the programmer's point of view.

The main characteristic of such architectures is that they are capable of executing all instructions that the architecture is designed for in any order. Control-flow architectures are therefore flexible, allowing a programmer to write a program with no constraints except the available memory. However, this brings multiple constraints (Lam & Wilson, 1992). The source of one of the main disadvantages of control-flow is in its ability to execute any instruction after any instruction. As a result, executing

1 nenadko@etf.rs

each instruction requires fetching operands, executing the instruction, storing results, and interrupt handling. Many of these utilize the same common bus, resulting in it becoming the bottleneck of the system. Further, loading operands from the memory and storing them presents a burden that is not always necessary. For example, if an instruction calculates a value that is used in the following instruction and nowhere else, it would be beneficial if the semi-result could be forwarded directly from one instruction to another.

Dataflow architectures are designed to process data by defining the transformations of information while it flows through a system (Milutinovic, Salom, Veljovic, Korolija, Markovic & Petrovic, 2017a). Dataflow architecture models computation as a directed graph. Nodes represent processing units that are responsible for executing instructions. Edges represent the flow of semi-results between processing units. The key advantage of dataflow architectures is their ability to exploit parallelism, enabling concurrent execution of independent instructions. By distributing data and computations across multiple processing units, dataflow systems can achieve high throughput and scalability, making them well-suited for handling large volumes of data (Babović et al., 2023a; Kos, Tomažič, Salom, Trifunovic, Valero & Milutinovic, 2015).

Dataflow architectures are often implemented using FPGAs (Field-Programmable Gate Arrays). Unlike traditional integrated circuits (ICs), such as microprocessors or memory chips, which are designed for specific functions and fixed at the time of manufacturing, FPGAs are integrated circuits that can be reconfigured (reprogrammed) by a user. This flexibility allows users to customize the functionality of the FPGA for each algorithm the FPGA should execute. FPGAs are composed of an array of programmable logic and input/output blocks and interconnects. Logic blocks are capable of executing logic functions, such as *AND* and *OR*. The interconnects connect logic blocks together in various configurations, enabling the implementation of complex logic functions. FPGAs find applications in a wide range of fields. They are often used in digital signal processing, telecommunications, and programming. They are also used for lowering the price of chip production by allowing tasks such as simulating ASICs (Application-Specific Integrated Circuits) before they are implemented. However, there are other technologies available for implementing dataflow architectures that can even have better performance but are not often used due to the limitations in technology or funding, e.g., GaAs (Milutinovic, 1986).

Dataflow architectures and control-flow architectures each offer distinct advantages and are suited to different types of computational tasks (Fan et al., 2023). Dataflow architectures have garnered recognition for their ability to accelerate a greater number of instructions per second while simultaneously exhibiting enhanced energy efficiency (Trifunovic et al., 2015). They excel in handling parallelism and are highly efficient for tasks where data dependencies are well-defined and can be executed concurrently (Milutinović, Furht, Obradović & Korolija, 2016). They also consume less power per instruction execution. Many high-performance computing algorithms can be accelerated using dataflow architectures (Korolija, Djukic, Milutinovic & Filipovic, 2013; Cvijetić, Korolija & Vojinović, 2022). On the other hand, control-flow architectures are more versatile and adept at handling unpredictable conditional branching, making them suitable for tasks with complex control structures. Combining these architectures allows for leveraging the strengths of each approach in a complementary manner. This hybrid approach enables efficient execution of both parallelizable and sequential tasks within the same system. Additionally, combining dataflow and control-flow architectures can lead to improved performance and energy efficiency by effectively utilizing available resources and adapting to the varying computational requirements of different tasks (Kos, Ranković, & Tomažič, 2015; Umek & Kos, 2016). Dataflow hardware architectures combined with conventional processors based on control-flow are also capable of accelerating artificial intelligence algorithms.

Nevertheless, in contrast to the development of control-flow algorithms, the development of dataflow algorithms typically demands a deeper knowledge of computer architectures, primarily attributed to the constraints of dataflow hardware. Besides that, additional knowledge is needed to utilize the dataflow hardware controlled by the control-flow program, which inherently necessitates significantly augmented efforts in terms of programmer tasks (Popovic, Bojic & Korolija, 2015), particularly when working on non-functional requirements (Popović, Korolija, Marković & Bojić, 2017). The increased effort stems from the need to adapt programming methodologies to accommodate the operational characteristics of dataflow architectures since the development phase for dataflow applications is predisposed to extended debugging, along with more time needed to optimize performance within the prescribed hardware limitations. Certain methods for automation of translation of control-flow algorithms to the dataflow paradigm have been developed to reduce the effort needed for programming dataflow architectures (Korolija, 2023).

The additional constraint to combining control-flow and dataflow architectures is the scheduling. Researchers have developed relatively fast scheduling algorithms due to the nature of high-performance computing tasks running on dataflow architectures that are usually executed during a considerable amount of time compared to the relatively fast tasks that are often executed using control-flow hardware (Korolija, Bojic, Hurson & Milutinovic, 2022).

Another important aspect of the combined control-flow and dataflow architectures is the expected lifetime and counterfeit detection. The duration is expected to be around the shortest, lasting from these two incorporated architectures, and the possible counterfeit processor chips could be identified using existing methods (Huang, Liu, Korolija, Carulli & Makris, 2015).

Researchers and the programming community have noticed the need for providing dataflow algorithms accessible in the open literature. As a result, the application gallery has been developed (Trifunovic, Milutinovic, Korolija & Gaydadjiev, 2016; Milutinovic et al., 2017), allowing users to view the source code of certain dataflow algorithms.

The aim of this research is to investigate the possibilities of applying existing research in the field of computer science on advancing dataflow architectures to allow faster artificial intelligence algorithm execution (Babović et al., 2023b). The existing research includes the research in the domain of compilers and in the domain of parallelizing the execution of algorithms. The presentation is founded upon the proposed method (Milutinovic, 1996) and has been evaluated by the authors in alignment with the proposed evaluation criteria (Banković et al., 2020).

DESIGN/METHODS/APPROACH

This article introduces a novel approach to automatically identify dependencies within and between dataflow kernels, essential for optimizing parallel processing tasks on dataflow hardware (Korolija, Popović, Cvetanović & Bojović, 2017). The method outlined entails constructing a dependency graph using a designed tool, facilitating a visual representation of the relationships between different data elements and operations within the kernel, but also letting the tool detect parallelizable portions of source code. By utilizing this tool, developers can efficiently analyze and comprehend the intricate dependencies present in their dataflow kernel code, thus enabling them to fine-tune performance and enhance parallelism. The article not only highlights the theoretical framework behind the proposed method but also offers practical insights through the inclusion of example code, illustrating the step-by-step process of dependency detection. The versatility of the proposed methodology extends

to hybrid processors, which integrate both control-flow and dataflow hardware components within the same chip die (Korolija, Jelisavčić, Minchev & Milutinović, 2022; Milutinović et al., 2021; Milutinović, Trifunović, Korolija, Popović & Bojić, 2017; Miladinović, Bojović, Jelisavčić & Korolija, 2022; Korolija & Štrbac-Savić, 2024). This adaptability may be crucial in contemporary computing architectures where heterogeneous processing units coexist to exploit the advantages of both paradigms (Milfeld, Korolija, 2022). By accommodating hybrid processors, the method becomes applicable across a broader spectrum of computing systems, including heterogeneous architectures, cluster, and cloud computing, ensuring its relevance and utility in diverse hardware environments. Ultimately, this article serves as guidance for developers seeking efficient ways to optimize dataflow kernels and leverage the capabilities of dataflow hardware for enhanced computational performance.

Compilers are software tools designed to translate source code written in a high-level programming language that is suitable for programmers into machine code so that it can be executed directly by a computer's processor. The process begins with the call to transform the input of the source code. The compiler begins by performing lexical analysis, thus breaking down the source code into tokens such as keywords, identifiers, operators, and literals. This step is important in recognizing the basic building blocks of the language and grouping them into meaningful units for easier processing. The following step is the syntax analysis, or parsing these tokens. The compiler performs syntax analysis, so that the structure of the code is checked against the rules of the programming language's grammar. In order to do this, the compiler constructs a parse tree or abstract syntax tree that represents the hierarchical structure of the code and verifies that it conforms to the language syntax. After syntax analysis, the compiler performs semantic analysis to check the meaning of the code. This involves type checking, symbol resolution, and other checks to ensure that the code adheres to the language's semantics and constraints. If the source code is analyzed and validated, the compiler can generate an intermediate representation of the code, which is a platform-independent and optimized representation that serves as an intermediate step before generating the final machine code. Many compilers include the possibility to optimize the code by applying various transformations to the intermediate representation to improve the efficiency and performance of the generated code. In this step, the unreachable or dead code can be eliminated, loop can be optimized, etc. Finally, the compiler translates the resulting intermediate representation of the code into the corresponding machine code suitable for execution on the computer architecture. This requires selecting appropriate instructions from the target instruction set and arranging the execution in a sequential manner to implement equal or optimized behavior. The output is typically an executable binary code that can be run directly on the computer architecture.

The crucial aspect of the compilers for this research is the ability to generate an intermediate representation of the code, serving as a bridge between the original source code and the subsequent analysis processes needed for detecting dependencies between instructions. By providing a structured and abstracted view of the code, this representation enables the readability of the algorithm for detecting dependencies and reduces the debugging time.

Detecting dependencies in source code in the general case requires identifying relationships between different components within software. In the case of dataflow architectures, these components may represent kernels but also instructions. Dependencies in source code can be of various types, such as variable references, function calls, etc. One common type of dependency in source code is when one function calls another function. In the case of dataflow programming, the same logic might be applied to detect dependencies between kernels. This logic involves analyzing the source code to identify function calls and determining the relationship between each pair of functions where one function calls the other. Within a single dataflow kernel, one could detect variable references, as dependencies that arise when two instructions use the same variable. Generally, if a variable is declared in one por-

tion of the source code and used in another as well, there is a dependency between those two portions of source code. Detecting variable references involves tracking the declaration and usage of variables throughout the source code.

In object-oriented programming languages, classes can inherit behavior from other classes, optionally overriding methods defined in parent classes. Detecting these dependencies involves understanding the inheritance hierarchy and determining dependencies between classes. A similar problem can be found in dataflow hardware programming, but this work doesn't cover these aspects of detecting dependencies. The same applies for dependencies between file imports. In modular programming, code is often organized into separate files or modules that can depend on each other. However, dataflow kernels are usually defined each in its file, without the need for importing a relatively considerable number of files.

Various static analysis tools can be used to detect dependencies in source code automatically. These tools parse the source code in order to build an internal representation of the program's structure and then analyze it to identify dependencies. Once dependencies are detected, they can be represented using dependency graphs. Dependency graphs provide a visual representation of the relationships within the source code, making it easier to understand and manage complex dependencies. Overall, detecting dependencies in source code can be done for many reasons. Some of them include understanding the structure and behavior of software, identifying bottlenecks, and improving the code by refactoring and optimizing. In this research, the dependency graph is created to support parallelizing the dataflow programs automatically.

Detecting dependencies between variables in C++ in the general case can be challenging due to the language's flexibility and the possibility of indirect relationships through function calls and pointers to data. However, even a relatively simple tool can detect direct dependencies between variables in source code and enable parallelization (Korolija, Furht, & Milutinović, 2023). The process or steps involved in creating and using the software for detecting dependencies will be clearly outlined. This is essential so that anyone following these steps can achieve the same results and outcomes.

The code from Algorithm 1 represents *dependency_graph.h* file. The following classes and functions are introduced. The Variable class represents variables in the input source code. For each variable, ID, type, and name are stored. Constructors are responsible for variable initialization, with a default name or a specified one. Method *print()* displays relevant information about the variable. The Dependency class represents a dependency relationship between two variables (Variable *variable* whose name is stored in the field *variable.name* depends on *dependsOn* variable). Method *print()* prints the details of the dependency in a clear format. The *DependencyGraph* class is in this example rather a mock class that holds only the most important information for the graph. It manages a collection of dependencies (dependencies vector). The *addDependency()* method adds a new dependency to the graph. Dependencies are stored as pairs of variables where the first one depends on the second one. The *printGraph()* method prints all dependencies stored in the graph.

```
#ifndef DEPENDENCY_GRAPH_H
#define DEPENDENCY_GRAPH_H
#include <iostream>
#include <vector>
#include <fstream>
#include <string>
```

```
// Enum defining types of variables in the dependency graph
enum VariableType { CONSTANT, SCALAR, ARRAY };
// Represents a variable in the dependency graph
class Variable {
public:
   Variable();                        // Default constructor
   Variable(std::string varName); // Constructor with variable name
   void print();                      // Prints information about the variable
private:
   static int nextId;                 // Static member to generate unique IDs
   int id;                           // Unique identifier for the variable
   VariableType type;                 // Type of the variable (constant, scalar, array)
   std::string name;                  // Name of the variable
};
// Represents a dependency relationship between two variables
class Dependency {
public:
   // Constructor with two variables:
   Dependency(Variable &variable, Variable &dependsOn);
   void print();                      // Prints information about the dependency
private:
   Variable variable;                 // Variable that depends on another
   Variable dependsOn;                // Variable on which another depends
};
// Manages the dependency graph of variables and their relationships
class DependencyGraph {
public:
   DependencyGraph();                 // Constructor for initializing the graph
   // Adds a dependency between variables:
   void addDependency(Variable &var, Variable &dependsOn);
   void printGraph();                 // Prints the entire dependency graph
private:
   std::vector<Dependency> dependencies; // List of dependencies in the graph
};
#endif // DEPENDENCY_GRAPH_H
```

Algorithm 1. *The Declaration of Classes for Detecting Dependencies*

The following code represents only the implementation of function *main()* from the file *dependency_graph.cpp*. Implementation of explained functions is trivial and more complex function implementation will be explained in this article.

```
#include “dependency_graph.h”
int main() {
   DependencyGraph graph;
   std::ifstream inFile(“test_program.cpp”);
   std::ofstream outFile(“resulting_graph.txt”);
   std::cout << “Reading test program...” << std::endl;
   std::string line;
   getline(inFile, line); // Read first variable name
   Variable varA(line); // Construct the variable
   getline(inFile, line); // Read “=” sign
   getline(inFile, line); // Read second variable name
   Variable varB(line); // Construct the variable
   getline(inFile, line); // Read “+” sign
   getline(inFile, line); // Read third variable name
   Variable varC(line); // Construct the variable
   outFile.close();
   inFile.close();
   // Claim dependencies between the first and the second variable:
   graph.addDependency(varA, varB);
   // Claim dependencies between the first and the third variable:
   graph.addDependency(varA, varC);
   graph.printGraph();
   return 0;
}
```

Algorithm 2. *The Implementation of the Main Function*

The function *main()* reads c++ statements from *test_program.cpp* to extract variable names and create instances of variables. Further, it adds dependencies (*varA* depends on *varB* and *varC*) and stores them in the DependencyGraph. Finally, it prints out the dependency graph in a structured format. This C++ program illustrates the construction and visualization of a dependency graph based on variable dependencies parsed from a hypothetical C-like source file (*test_program.cpp*).

The presented structured approach is invaluable for tasks such as code optimization, refactoring, and understanding program logic. It provides clarity and insight into the inter-dependencies within statements of a C++ program or between dataflow kernels.

The improved version of the algorithm introduces in Variable class *operator* ==, necessary for comparing variables so that there are no two variables with the same name, and methods *setRead()* and *setWrite()*. The Dependency class is also appended by the *operator* ==, so that no two dependencies exist with the same pair and order of variables. However, the biggest change is in the function main, where the most important portion is shown in Algorithm 3.

```
int fileLineNumber = 0;
while (getline(inFile, line)) {
    fileLineNumber++; // Increment line number

    std::cout << std::endl << "Parsing file line: " << line << std::endl << std::endl;
    std::vector<std::string> dependsOnList;
    // Parse expression using parser
    parse(line, dependsOnList);
    std::cout << "Lhs token detected: " << Parser::_lhsToken << std::endl;
    std::string lhsTokenString = Parser::_lhsToken;
    Variable *lhsVar = VarManager::find(lhsTokenString);
    if (!lhsVar) {
        Variable temp(lhsTokenString);                  // Create temporary variable
        lhsVar = VarManager::find(lhsTokenString); // Find variable again to get its reference
    }
    lhsVar->setWrite();
    std::cout << "List of variables that lhs depends on: " << std::endl;
    for (auto &dependsOn : dependsOnList) {
        std::cout << dependsOn << std::endl;
        Variable *rhsVar = VarManager::find(dependsOn);
        if (!rhsVar) {
            Variable temp(dependsOn);               // Create temporary variable
            rhsVar = &globalVars.back();            // Get reference to the last added variable
            lhsVar = VarManager::find(lhsToken); // Find variable again to get its reference
        }
        rhsVar->setRead();
        graph.addDependency(*lhsVar, *rhsVar, fileLineNumber);
    }
}
//...
VarManager::printDetailed();
graph.printGraph();
```

Algorithm 3. *Improvements in the Implementation of the Main Function*

The updated version of the *main()* function orchestrates the creation of a dependency graph. Here, each line of the input test program is read and processed to identify dependencies between variables. The most important feature is that variable and dependency handling is implemented to support multiple dependencies. For each input file line (i.e., expression), it parses the line using a *parse()* function, whose implementation is available in the open source, except for a few changes needed to support detecting dependencies. The left-hand side (LHS) variable of the expression is identified (*lhsToken*), and its dependency relationships are determined by parsing the expression. While parsing a statement, square brackets are also allowed to support vectors. Vector *_dependsOnList* is updated whenever a dependency is detected in a statement.

While the *Variable* class represents variables, maintaining their names and read/write status, *VarManager* is introduced to provide static methods *printAll()*, *printDetailed()*, and *find()*. It is responsible for managing and accessing all variables created during the process of detecting dependencies and printing results. The improved version of the algorithm displays the list of variables found on the LHS, the list of all variables along with flags showing whether each of them is read from, written to, or both, and the constructed dependency graph where each dependency is assigned a unique statement number. This algorithm can help software developers understand how variables depend on each other within a program, which is crucial for tasks such as debugging, optimization, and restructuring of their code.

Improving the parsing of loops in the source code is implemented using a modified lexer available in the parser source code. This involves refining the process of tokenizing and interpreting user code. A lexer, or lexical analyzer, breaks down C++ statements into tokens, which are the smallest units of meaning in the C++ language. To optimize this process, several strategies can be employed, including optimizing the lexer's implementation for efficiency, leveraging efficient data structures, and optimizing regular expression patterns used for token recognition.

Parsing multiline loops is implemented by interpreting and understanding consecutive statements that span across multiple lines. To effectively parse multiline loops, recognizing the beginning and end of the loop construct and identifying loop control statements (e.g., conditions for loops and iteration parameters) is needed. This is implemented in our source code, without modifying the parser, so that the scope of the parser is limited to parsing a single C++ statement.

In compilers, loop parsers typically use recursion or similar techniques to navigate the hierarchical structure of nested loops. These methods allow parsers to accurately associate loop bodies with their respective loop headers. Error handling is also needed in compilers for parsing multiline loops. However, in our algorithm, parsing is limited to parsing loops that are not nested, without error handling mechanisms.

Further, the parsing algorithm is improved by implementing functions to associate identifiers to statements where read or write occurred. This will be explained using the *setRead()* function. The Variable class represents variables in a program and tracks where they are read from (read) and written to (write). The *setRead()* function is responsible for recording when a variable is read by pushing a specific statement identified into the vector of statement identifiers associated with the variable.

The statement identifier is defined as an integer representing the unique identifier of the statement where the variable is read. The *setRead()* adds a statement identifier to the read vector associated with the current instance of *Variable*. This vector keeps track of all statement IDs where this variable has been read. In the user C++ source code, whenever an expression or assignment involving variables is parsed, the program identifies which variables are read and written to within a statement. As an example, when parsing a line of source code where a variable *v* is read in a statement with identifier 5, the *setRead()* function call for the variable *v* would append number 5 to its read vector, indicating that variable *v* is read in a statement with identifier 5.

The parsing algorithm is designed to build a dependency graph between variables or kernel arguments and outputs based on their read and write operations across multiple statements or kernels. This graph helps analyze how variables depend on each other throughout the code, enabling automatic parallelization of the code using the dataflow paradigm.

By tracking all statements of the user source code and tracking reads using the function *setRead()* and writes using *setWrite()* for each variable, the program constructs a comprehensive picture of data dependencies, essential for tasks like parallelization of dataflow kernels or understanding data flow in complex algorithms.

Further improvement of our parsing algorithm includes detecting kernel calls in order to be able to detect dependencies between dataflow kernels. The same algorithm is also applicable to detecting function calls.

The *parseKernel()* function is designed to parse a line of the user source code that potentially contains a function call or a call to the dataflow kernel. The *parseKernel()* function also determines if the function call involves a return value assignment and extracts details about the function and its arguments. This function takes the reference to the dependency graph where dependencies between variables are stored, the statement user file line where a kernel or function call may occur, and an integer representing the current maximum statement identifier. The function first initializes an input string stream with a given file line, enabling the lexer to tokenize this line. The value of the return variable is initially assigned the first token, presuming it represents the variable to which the function's return value is assigned.

Identifying kernel or function call is implemented in the parsing algorithm, apart from the existing C++ code for parsing a single statement. First, the equal sign is searched for, which represents a statement where a function has a return value. This is not used when parsing kernel calls. No expressions are allowed where the argument can be replaced with an expression containing the equal sign. Next, the kernel name is extracted using the lexer from the existing C++ code for parsing a single statement. In order to claim that the statement represents a kernel of function call, the following token to be parsed has to be the open bracket token. At this stage, it is assumed that the statement is a kernel of a function call.

Parsing arguments are implemented similarly. First, a token is extracted, representing a variable name. Following, the arguments separated with the comma sign are recognized. This process is repeated until the closing bracket token is found.

The *parseKernel()* function plays a crucial role in identifying possibilities for reorganizing and parallelizing kernel calls. It also contributes to constructing a dependency graph that tracks relationships between variables based on function calls and assignments.

In the improved version of the parsing algorithm, the *Kernels* class is implemented to manage dataflow kernels and their relationships. It also supports managing function calls within the user source code. It supports initializing a kernel, finding the index of a function by name, adding a relationship between two kernels, etc.

Rearranging kernel calls and code execution based on dependencies involves ensuring that code is executed in the correct order to satisfy dependencies between different parts of the program. The first step in this process is the identification of dependencies. Dependencies can be of various types, such as data dependencies, control dependencies, or kernel dependencies. For example, a statement that uses the value of a variable initialized elsewhere represents a data dependency. We are mostly interested in dataflow kernel dependencies. The analysis of dependencies determines the correct order of execution. This may involve examining the flow of data and control within the program to understand how different statements and kernel and function calls depend on each other. After this step, the rearranging of code execution can be done. Based on the analysis of dependencies, for each statement or kernel of function call, it can be determined how far it can be moved up or down without affecting the

result of the program execution. This may involve moving blocks of statements or even restructuring the program logic if the programmer finds a useful guide in the rearranged code, which can further lead to the performance optimization by minimizing unnecessary dependencies and maximizing parallelism where possible.

In the existing algorithm for the automatic parallelization of the source code, the synchronization mechanisms are not applied. In cases where dependencies between different parts of the code cannot be resolved through rearrangement alone, a mechanism can be implemented to coordinate the execution of dependent parts of the code using locks, mutexes, semaphores, or barriers to ensure that certain tasks are completed before others begin.

Overall, detecting the dependencies between statements and kernel and function calls in the source code is a critical aspect of improving the performance of a dataflow program. As the dataflow programming model is inherently parallel, the incorrect execution order can lead to race conditions, deadlocks, or other synchronization issues. By automatically analyzing dependencies and organizing code accordingly, it can be ensured that the user program executes correctly and efficiently.

FINDINGS

The execution of the proposed algorithm is depicted using the C++ source code given in Algorithm 4. The comments in the source code are set to be equal to the statement identifier of each statement. As a result, the first statement in the *for* loop has three identifiers, equal to the number of *for* loop iterations.

```
using namespace std; // 1
#include <vector> // 2
#include <iostream> // 3
unsigned int foo(unsigned int a1, unsigned int a2){ // 4
   return a1 * 10 + a2; //5
} // 6
int main(){ // 7
   unsigned int i, a, b, c, d, e, v[10]; // 8
   a = 10; // 9
   b = 5; // 10
   c = a + b; // 11
   d=1+(b  *(c+   6))^2; // 12
   e = b; // 13
   v[0] = 1; // 14
   for(i = 0; i < 3; i++){ // 15
      v[i] = a; // 16, 18, 20
      c = v[i] + 1; // 17, 19, 21
   } // 22
   v[0] = a * e; // 23
   c = foo(a, b); // 24
}
```

Algorithm 4. *Example of User Source Code*

The resulting dependency graph for the function *main()* of the example algorithm is given in Table 1. One may note that the dependency table for the function is purposely omitted, as it contains no dependencies.

Table 1. *Dependency Graph of the Parsed Source Code*

	a	b	c	d	e	v[0]	v[1]	v[2]
a								
b								
c	11, 24	11, 24				17	19	21
d		12	12					
e		13						
v[0]	16, 23				23			
v[1]	18							
v[2]	20							

The presented algorithm can also detect function calls and dependencies among them. The same logic is applicable to kernel calls. The results of executing the presented algorithm with multiple kernels detect dependencies between kernels, enabling automatic parallelization of kernel execution. Exiting frameworks for transforming the code from the control-flow to the dataflow paradigm can generate the VHDL files and further configure the dataflow hardware based on the user definition of kernels implemented in a high-level programming language (e.g., MaxJ).

The execution flow of the Maxeler framework is as follows. The code written in a high-level language, e.g., *C*, prepares scalar inputs used in kernels and signals for multiplexers and demultiplexers using a conventional approach by calling a function defined in the library. The same convention is used for calling the dataflow hardware to execute the most time-consuming portion of the algorithm using the dataflow hardware and return results. Multiple kernels can be initiated directly from the *C* code but also using the manager. In this scenario, the manager for kernels acts as a kernel itself, connecting input signals to the manager to appropriate inputs of kernels it controls. After the manager code is executed, the kernels will be connected by the framework. In this research, authors didn't consider parsing the manager itself, as it is specific to the company providing the framework. On the other hand, calling kernels directly from a high-level language, e.g., *C*, is common for all libraries provided by various hardware vendors. The detection of dependencies between the execution of functions is depicted using the C++ source code given in Algorithm 5.

```
int aa(int a1, int a2){
    return a1 * 10 + a2;
}
int bb(int b1, int b2){
    return b1 * 10 + b2;
}
int cc(int c1, int c2){
    int d;
    d = bb(c1, c2) * aa(c1, c2);
    return d;
}
int main(){
    int a, b, c, d, e;
    a = 10;
    b = 5;
    d = 3;
    e = 4;
    c = aa(a, b);
    b = cc(e, d);
}
```

Algorithm 5. *Example of Function Call Dependencies*

The result or parsing function calls of the source code is given in Table 2. This is a fairly simple example with the purpose of showing the possibility of parsing function definitions and function calls, forming the graph of function calls. In order to be able to determine the possibility of moving the execution of a function before or after the line where it is executed, dependencies between arguments have to be taken into account as well. This is achieved by treating function calls in the same manner as expressions. For example, if a result of a call to function *aa* with arguments *a* and *b* is stored in a variable *c*, as shown in Algorithm 5, the dependency graph would be the same as if there was a statement $b = e + d$ in the same line of the source file. For each variable, the proposed algorithm keeps track of statement identifiers where it is read or written to so that the statement execution could be moved without affecting the result of the execution of user source code.

Table 2. *Dependency Between Functions*

	main	aa	bb	cc
main	-	+	-	+
aa	-	-	-	-
bb	-	-	-	-
cc	-	+	+	-

Along with the dependency graph between statements of the user code generated with the proposed algorithm, this further supports automatic translation of multiple statements of the user source code into the dataflow architecture by choosing the most suitable set of instructions based on the acceleration using the dataflow hardware for a given user input. Although user input is not known before running the application in a general case, the algorithms that are executed using the dataflow hardware often have the number of iterations known in advance, before executing the algorithm.

Executing algorithms in a cloud environment assumes sharing multiple computing resources by multiple algorithms. In the case of dataflow programming, this means sharing dataflow hardware units by multiple kernels, i.e., a single dataflow card can be attached to the multicore processor using the PCIe bus (this is only one of the possible configurations). Sharing a single dataflow card among multiple algorithms implies that there will be multiple kernels executing simultaneously. If the scheduler recognizes that the same dataflow algorithm is required to be executed in the cloud, these can be executed by sharing the dataflow hardware in such a manner that a separate kernel can exist for different instances of the algorithm, and partially occupied kernels can be shared among these instances. This can lead to an even higher acceleration factor when using dataflow hardware in a cluster or a cloud for the execution of artificial intelligence algorithms on the same type of input files (e.g., frames from a video surveillance system). Example applications can be found in many machine learning algorithms that already exploit the benefits of reconfigurable dataflow architectures (Filippas et al., 2024; Yu et al., 2024).

Figure 1 depicts the acceleration possibility in the case where there are multiple instances of the Lattice Boltzmann algorithm running on a single dataflow card (i.e., dataflow jobs), where each instance consists of five kernels, four for processing edge elements of all matrices, and one for processing other elements of matrices.

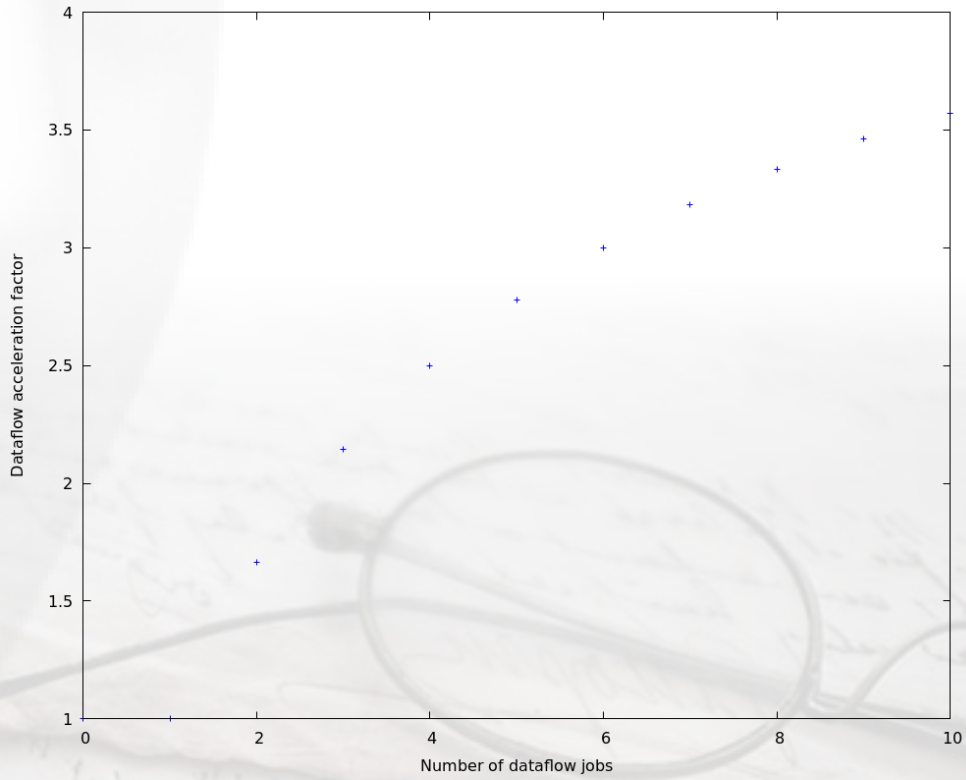


Figure 1. *Dataflow Hardware Acceleration When Combining Dataflow Kernels of Lattice Boltzmann Method*

In the case of executing the method on matrices that have reasonable sizes, the processing time of kernels that process edge elements is neglectable compared to the execution time of the kernel that processes other elements. In this scenario, four kernels processing edge elements can be shared among all dataflow jobs. We can assume that kernels occupy approximately the same chip die surface. This way, the acceleration factor that can be achieved using the same chip area is equal to the ratio between the number of kernels needed if all instances would have to use five of their kernels divided by the number of kernels in the case of sharing edge kernels among all dataflow jobs.

ORIGINALITY/VALUE

While the acceleration possibilities of parallelizing the code execution using the dataflow hardware exist, not much work is performed to automatically transform control-flow algorithms into dataflow algorithms. This can be inferred from the relative scarcity of automated tools and frameworks specifically designed for this purpose compared to those available for control-flow paradigm, such as parallelization or optimization. There are multiple reasons why this is the case. In this chapter, several possible reasons will be explained.

Converting control-flow algorithms into dataflow representation is inherently challenging due to the fundamental differences in the execution models of these paradigms. Control-flow algorithms rely on explicit execution of statements in sequences, allowing branching of instructions, whereas dataflow algorithms express computations as a flow of data between operations, allowing no changes in the execution unless using special conditional statements that assume that both scenarios are implemented in the dataflow hardware during the program execution, but that only one path will be useful. Transforming control-flow to dataflow programs requires significant restructuring of the code and often introducing new data dependencies and parallelism, making it considerably complex but also error-prone (Milutinović, Trifunović, Korolija, Popović & Bojić, 2017; Milutinovic, Salom, Veljovic, Korolija, Markovic & Petrovic, 2017b).

Unlike loop parallelization or optimization and similar transformations, there is no widely accepted generalized solution or methodology for automatically transforming control-flow algorithms into dataflow counterparts. While some research has been done in this area, much of it is experimental and focused on specific domains or problem types, rather than providing general-purpose solutions applicable across a wide range of applications. There are some frameworks, but with limited functionalities, e.g., for creating a dataflow kernel written in a programming language specially designed for programming dataflow hardware using a similar language to Java.

The transformation from control-flow to dataflow is highly dependent on the specific characteristics and requirements of the application or problem domain. Different applications may require different dataflow structures or optimizations, making it difficult to develop generalized transformation techniques that work effectively in all cases. Also, the performance of the dataflow hardware implementation of a control-flow algorithm depends on the input data the dataflow hardware will work with. Since the frequencies of control-flow hardware are an order of magnitude higher than those of dataflow hardware, if there is not much computation, it is more justifiable to execute the code using the control-flow hardware.

Automating the transformation process may require significant computational resources. Analyzing control-flow algorithms, identifying data dependencies, and restructuring the code to automatically produce a dataflow algorithm is computationally intensive and may require sophisticated static anal-

ysis techniques and optimization algorithms. In the case of the debugging, the resource requirements are even higher, especially if the simulation of the transformed algorithm should be performed on a low level.

Dataflow programming models are not suitable for applications usually executed on personal computers but rather only for high-performance algorithms executed using computer clouds or clusters. Most of the existing software is designed for control-flow computing architectures and may not benefit from being transformed into a dataflow paradigm.

In the conclusion, while there has been some research and experimentation in transforming control-flow algorithms into dataflow hardware automatically, the lack of widely adopted tools and frameworks suggests that this area remains relatively underexplored compared to tools and experimentation in the field of control-flow hardware. The importance of executing artificial intelligence algorithms faster and with less power consumption justifies the effort in automating the translation of control-flow algorithms to their dataflow counterparts. The manual transformation loses in importance over time, as high-performance computing architectures become more complex and capable. As a result, managing many kernels in a cloud in real time can only be done automatically. Further development of the presented algorithm should take into account dependencies in the streams on the element-level, and not only by treating streams as parameters.

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NETWORK-RESEARCH BASED DYNAMIC METHOD IN CRIME PREVENTION AND INVESTIGATION

Zoltán György Bács, PhD[1]
Ludovika University of Public Service Budapest, Hungary

PURPOSE

The purpose of the present study is to introduce the basic concept of the new method, to explain the interconnection between formation of new information based upon already known information, the time-flow and the formation of information networks and the dynamic link between the changing values of information on the subsequent progress of the investigation. This paper is also aimed to point out the urgent need to change the traditional concept of crimes as social and societal phenomenon. The suggested new method gives a chance to consider the crimes in a much wider context, including some psychological aspects of delinquency in general terms and in specific types of crimes.

The method in matter also demonstrates the advantages of the new approach. Among them, the quicker decision-taking and the subsequent higher operability are the most important ones.

DESIGN/METHODS

The method of research presented in this study is deductive and comparative analysis. The deductions leading to setting up the new theory of information and the new theory of dynamic networks and its possible fields of application started four years ago during a regular coffee break. The most important obstacle of carrying out a traditional academic research was that neither the Hungarian nor the international scientific literature had publications related to this new approach to the information. Another, not less significant difficulty I had to overcome was that although there are different practices of using dynamic matrix-based solutions, they are mostly just to observe the current or at least short-term tendencies in economics and finances. I discussed this topic with one of the internationally acknowledged experts in the field of theory of networks, Albert-László Barabási, who confirmed they researched the dynamic matrix neither from point of view of law-enforcement nor from other perspectives. They usually research networks properties in the daily life, like phone or postal networks, etc. … (Barabási, 2003).

Other publications dealt with the phenomenon and use of networks in the field of public service (Auer Ádám & Joó Tamás, 2019), even though the most meticulous search for similar publications in the field of law-enforcement or counter-terrorism did not give any result. I had no other chance than going forward alone.

Beside the theoretical explanations, the study contains several fictitious cases to depict the theory in situations close to real circumstances.

1 bacszgyorgy@gmail.com

APPROACH

Every single crime is a result of a process influenced by many different factors and processes. The factors are also results of processes, which led to the factor that in one way or another played certain role in the further development of the process, which culminated in the crime in matter.

Some of the factors influenced the circumstances of the crime, some other factors had connections directly to the perpetrators. Among the latter, there might have been those which triggered the personal features of the perpetrator(s) encouraging or discouraging them to perpetrate the crime. In the human sphere, even in the criminal world, the factors usually reach any person in form of information. What refers to the factors influencing the circumstances, the changes reach the persons involved in that activity in the form of information and provoke certain reactions. The reaction(s) contain information for other people with whom the first person is linked in one way or another. Is it a network? Yes, it is. Does the information spread over through the network? Yes, it does, no doubt!

All our professional life tightly linked to the phenomenon, we call information. Therefore, one of the key points was to find out what information is, and how the information appears, what kind of character the information has and what kind of factors may influence it? The next couple of questions appeared immediately: does the information have a life cycle, how can we determine the value of the information and its impact on the ongoing process (investigation)? The third level of question began when we try to find out the way how the information can link to other information. What should be common between different elements (information) to find and join each other and compose new information?

Once we have a more or less clear picture of the properties and mechanisms of information we must answer to the next question: what kind of limits might have the information network? Can this network have any geometrically describable form? Both questions have a negative answer. Neither the information network nor its geometry can be determined. The information forming networks cannot have timeframes, since nobody knows when information emerged first. The links between different elements of information network could be close or could be very remote. One of the examples is the so-called "Butterfly Theory", i. e. everything is linked to everything. What does it mean in practice? It means that any change in any element of the information network will have a consequence in other elements in one way or another. The chain reaction of consequences will spread all over the network provoking subsequent changes even among the remote elements.

FINDINGS

Types of Networks[2]

The statement above is valid in cases of open 'dynamic' networks. While the elements of the dynamic networks are exposed to changes and interact with other elements, they can be linked directly or indirectly in different ways and also can integrate new elements, the so-called 'static' networks cannot integrate new elements, their elements have permanent links and under no circumstances changes influence them. Neither can they change their value; the marks on its sides are always the same. The elements of the static networks never interact. For example, the dice is a static close network. It can have many different reference points as for example any of its sides, the geometric center of the cube, any of the angles, etc. …

2 This paper does not study the bi-dimensional and classic mathematic networks.

Another type of network is the Rubik's cube. Its elements, sides are exchangeable; they move according to certain patterns but no other elements can join the network. It has a concrete geometry and new elements can be attached by changing the basic geometry only. The Rubik's cube is a dynamic close network. Although the reference point of the Rubik's cube might be any of its elements the most practical reference point is the crossing point of main axis in the geometric center inside the cube. In spite of moving the elements according to certain patterns, the elements value, i.e. their color always remain the same.

The dynamic network has no geometry, has no geometric reference point, its elements may change their values and may have different influence on each other depending on other circumstances and the time of new information. The dynamic network grows with every new information since new information may extend the previously formed network integrating new 'sub-networks' through the new, recent information.

The Main Reference Point of the Dynamic Network

As the dynamic network does not have a traditional reference point like the geometric, mathematic, or trigonometric center, there must be something else. Yes, indeed, there is the most special reference point: the time! Maybe, the time is the most enigmatic thing in the world. It is not a phenomenon like light or sound, it cannot be perceived like altitude or depth, it has no beginning, has no form of appearance. Neither has it direction. It does not have any natural measurement. Due to the genius inventions of the human spirit we have mechanical, electro-mechanical, electronic and nuclear devices that help us to measure the periods of different length of time.

We have stated earlier that the dynamic network has no geometric form that is amorphous. Thus, the only way to orientate in the network is the use of anteriority of information forming the multi-dimensional network. Yes, the time may serve to orientate only but not to determine the consequent line or chain of information. The reason is the following: we perceive the new information input in a given moment that can be exactly determined. Nevertheless, between the moment of perception and the moment of the 'birth' of information there might be a significant difference in time. The birth of information always prevents the perception of the information.

Life Cycle of Information

Does the information have a life cycle? Yes, it has! The 'life' of the information starts when it appears of the combination of minimum two, or may be more, previous information. At this point previous information may become invalid because of being replaced by a new one. This new information is valid until a newer one replaces it. During the life cycle of information, its comparative status (Comparative Information Status, C.I.S.) and its impact (Information Value Impact, I.V.I.) play a significant role in analyzing and assessing the on-going process(es). The role and significance of the value and impact I shall explain later.

Retrospective and perspective - predictive view on information

All the information what we perceive at a given moment has already modified the direction (vector) and the impact of the flow of information in progress. At the given moment, when we perceive the information, it has already modified what has happened earlier, thus we see the result of the accumulated impact of all the previous information, the modified vector of the flow of information in progress.

Sometimes, it is not enough to relay on the already known information when analyzing any process because missing or yet unknown information may modify the vector of the process in question at another moment. Therefore, it is highly important to consider whether there were breaches in the information flow. The breaches mean that information, which has already modified the process in question earlier, remains unknown, thus we can only speculate what has been its effect on the process. Based on the information context we might have a chance to calculate or at least suppose what could have been the missing information and what kind of effect it had on the vector of the process in question. This retrospective analysis may have an important role in giving a predictive assessment, when a later information relevant to that unknown one mutually effect the further calculable alternative vectors of the process in question. The permanent phenomenon of interference of information of different periods, relevant in obvious or even hidden form to the process in question, consists the fundament of the method of retrospective-based analysis and dynamic predictive assessment to be used in crime prevention, investigation and counter-terrorism.

How can we imagine the analysis in progress? Is there a chance to visualize the approach to the point of analysis and to follow it in the direction of predictions? Of course, it is possible. The field of gathering the data and information for the analysis and assessment is part of the dynamic matrix. One can imagine it like two funnels or cones turned to each other with their smallest diameter. Where they touch each other is the point of analysis and assessment. The largest diameter of the first cone can be infinite depending on the range of data and information we use for carrying out the analysis and assessment, and the largest diameter of the second cone can also be infinite depending on how far we want to go forward with our deductions as the result of the assessment. It is clear that the closer we approach the smallest diameter the higher and higher is the accuracy of the information/factors leading to the features of the information in question at the given point of analysis due to the closer links between the factors/information. Thus we can set up the picture of the 'prehistory' of the formation we analyze. Subsequently, as we leave behind the point of analysis, the accuracy of the assessment of the possible consequences in the second cone will be smaller and smaller due to the growing variety of plausible new factors/information capable to influence the information creating possible alternative consequences (Bács, 2020).

COMPARATIVE INFORMATION STATUS (C.I.S.) AND INFORMATION VALUE IMPACT (I.V.I.)

Comparative Information Status (C.I.S.)

To give an appropriate definition to the notion Comparative Information Status, we have to return to the question: what is the difference between data and information? If you search through different encyclopedia, you will find several different definitions. From our point of view, the most suitable definition is the following: data with some property that qualifies it as different from other data from the same category. (For example, data category is color, temperature, frequency, etc… Information is yellow color, high temperature, low frequency….)

It is also well known since very remote times that there is no useless information. The question is always the same: who will, when and what for use any information. Consequently, any information has a status expressing its novelty for those who are interested in the information. Starting from this, the status of information can be determined in comparison with other related information and may be received earlier. Therefore, information can have the following status:

- Factual New (FaN), if it contains unknown earlier real information that might be proven;
- Already known information (Kn);
- Information denying previous information (D);
- Calculable (Ca), if its probability based on other information is 50% at least;
- Supposed/Probable (SuP), if the probability of the information is less than 50%. (Bács, 2022)

The practical use of the classification system above is imminent when during any law-enforcement activity urgent need of assessment is required. Using this classification makes easier to sort information for further use, what is necessary for the selecting and planning not only the next measures, but also for setting up a draft of a longer operational plan. This classification indicates the status at a given moment, what can change when new information is available. For example, we have classified some information as SuP, but another information source confirms our information as trustworthy thus the information changes its status into FaN.

Mathematic Expression for Information Value

If we need to use a quick code system for operational purposes, I suggest the following:

- For factual new information (FaN) I^{+};
- For already known information (Kn) I^{0};
- For information denying previous information (D) I^{-};
- For calculable information (Ca) $I< 50\%$;
- For supposed/probable information $I> 50\%$.

These codes might be used during immediate analysis and assessment of the results of interrogations as well.

Information Value Impact (I.V.I.)

By determining the criteria of I.V.I. the most obvious way is to consider the possible consequences, the possible urgency of taking measures upon the (new) information. These criteria may be the following:

1) Vital importance;
2) Critical;
3) Significant;
4) Important;
5) Secondary;
6) Collateral.

What does it mean?

1. The information has vital importance if it contains information requesting immediate response due to its possible consequences radically changing the situation or even the outcome of the on-going operation or investigation. For example, we are in the process of apprehension of a supposedly unarmed person but on our way there our operational team receives information that the target person has concealed firearm or that we can face an armed group ready to resist and counteract us.

2. The information is critical if the new information radically contradicts or questions the previous decision (based on previous information). For example, the team is going to apprehend a person at his/her home but the external vigilance group informs us that the target person has left his/her home and is moving. This information radically changes the majority of conditions of apprehension.

3. Significant may be the information if it does not alter at the given moment the result of the on-going investigation or operation but it may influence the circumstances of implementation. It may happen when the operative team is going to arrest a person, but we have received information that he/she is ready to give himself/herself up voluntarily.

4. The important information does not influence the result of the on-going investigation or process but may change the conditions of implementation. For example, the person under investigation voluntarily delivers the evidences or expresses his/her will to make a comprehensive and detailed confession (the present criteria are also suitable for the classifications of evidences).

5. Secondary is the information we have acquired when investigating the target person's individual and financial conditions, his/her social network and other circumstances, which have no influence on carrying out the investigation. For example, the person in question liked riding a green Volkswagen Passat.

6. Collateral is the information which is not related to the given case and has no influence on the on-going investigation or process but may be reevaluated and linked to other information (case) or its preliminary classification as collateral and has to be modified or changed. For example, if the green Volkswagen Passat has been sold to a person involved in another crime.

This classification system and its criteria are not carved in stone or definite. There might be other sub-criteria or sub-divisions as well brought up by the changes in criminal investigation or in law enforcement in general. The essence is that all phenomena, all evidence, all actors and their circumstances have to be considered as elements of a wider network in permanent changes. Once we understand the dynamism of the network, we will be able to consider the possibly expectable changes within the network.

Application Opportunities: Crime Prevention and Law Enforcement, National Security and Counter-Terrorism

The information theory described above – as I have already mentioned – composes the fundament of the predictive analytical and assessment method based on the research of dynamic networks. To make the analytical and assessment method run, it is indispensable to register all the features of the object of research up to the smallest ones. The structure of registration (Field Information Base, FIB) must be a pyramidal one splitting up the details of every feature in several subgroups from the top to the bottom, giving more and more details. Another almost similar and parallel pyramid will contain the known details (information) of the given case (Case Information Base, CIB). Comparison of the CIB with the FIB will show the general features of the case, and the peculiar ones. It will show whether there are new, unknown before features. The comparison of the information bases will also show whether there have already been cases with almost identical or similar features. Up to this point, there are very few elements compared to the traditional law enforcement methodology. The only new features are probably the digitalized register of features of all the crimes and the computer-assisted comparison process. A new element is the integration of many other FIBs into the comparison process. The more fields are included, the higher the background of the given criminal case is. One of the most important fields to be processed in the FIB is psychology. Setting up the psychological profile during the investigation

using the behavioral models in the FIB can reduce the circle of the potential perpetrators, and disclose us the real ones. It is obvious; this method is more efficient in re-incidents or reiterated crimes using similar Modus Operandi, perpetrated under similar circumstances, having similar features, etc. … At the same time, this comparison can exclude a number of potential perpetrators and thus the investigation can save precious time and reduce the costs of the investigation. It is also clear that every new criminal case has to have its CIB. After the case is closed, all these CIBs will be included into the General Information Base (GIB).

The Use of Artificial Intelligence (AI)

It is clear that even a higher level of efficiency may be achieved using artificial intelligence in information processing. The computer technology (CT) has been a reliable support for decades in law enforcement and it still has resources for further development. One of the fields of use of the newest achievements in CT is the widening use of AI not only for information processing, but also for searching information in every accessible information base according to the given parameters. AI can also carry out the preliminary analysis and assessment of the obtained information after combining and re-combining them following the goals of given task. For example: the AI can find sources of explosives, weapons, ammunitions for sale on the internet, and can combine it with previous information about looted items. Let us suppose that our Spanish colleagues have information about a terrorist bombing during an important event. The AI assisted preventive investigation will search for organizations interested in the terrorist act, their connections, the possible materials to be used for the terrorist act, the possible sources of these materials. At this point the AI can indicate that a couple of years earlier two hundred pounds of highly efficient explosive was stolen from Montana in the United States. Surprisingly, some explosives with the same features have appeared in the Darknet and bought almost immediately. It is a clear trace. With combination of the previous information with the new findings, one of the working hypothesis will be that the buyer of the explosives was the terrorist organization. In this case, different preventive measure may be taken to avoid the import of the material from abroad, and to find the load in the country. As I have written earlier, every new information can be the base for the forthcoming network analysis based on this given information.

In the case when particles of a new designer drug were found during the search of the house, after the definition of its chemical composition, the AI can indicate which illegal (or even legal) laboratory has produced the drug, what kind of previous information the anti-drug units have about the laboratory and the criminal organization operating it.

Another direction for using AI may be the permanent wide-range search in all the accessible information bases for information indicating potential challenges, risks and threats for security and safety. In this mode, the AI screens and filters the information bases trying to find even the remote links between the information components by recombining them as elements of possible networks. The wider is the range of screening, the more accurate is the warning about possible major crimes. Consequently, the more the acquired, calculated or supposed information is, the more precise is the predictability of the forthcoming phenomena in the process leading closer to the criminal acts.

FINDINGS

The above described dynamic analysis and assessment method to be called "Danube Analyst Method (DAM)" is unique since all the actual analyzing methods are based on static networks without considering the possible effects of the calculable or supposable information on the investigation progress.

The DAM is unique due to the permanent monitoring of the changing parameters influencing the investigation or process in question and their use for predictive analysis and assessment.

Another novelty of the DAM is that while the traditional investigation methods consider the facts, factors and information about them as stabile (definite, with constant value or significance) elements of the investigation process, the DAM differentiates their status, value and influence throughout the investigation or process in matter.

The DAM is a new method due to its information processing. This is the only method based on the dynamic network theory and the new information theory as a whole.

This is the first method assisted by the wide use of Artificial Intelligence (AI). Although many countries use the AI for different purposes within law enforcement, this is the first method using it in a complex way, beginning from the production of software to search, analyze and assess the information, through the permanent search for information using its own elaborated set of software and assisted by controlling software and other software for retrospective comparative analysis. The AI assists the analytical tasks not only by accelerating the information processing, but also up to pointing out the vectors/directions sorted in priority order of possible further development of the investigated process or the process in question. This dynamically evolving output gives a chance to plan the necessary response or preventive measures and to modify or specify immediately if necessary.

The DAM is the first multipurpose method applicable in different practical and scientific fields within law-enforcement and beyond. Its associative capabilities to select and arrange specified information in networks and to widen the frames of search by attaching newly created other networks even from other fields.

The DAM is an efficient tool to boost up the decision-making process, the implementation of which increases the efficiency of investigation and prevention. By applying the DAM, its users can save significant human, material and financial resources.

ORIGINALITY/VALUE

Being the first analysis method using the widest possible database and assisted by the fastest selection, systematization, processing, evaluation, assessment and double-checking in its every moment provided by the AI, this analysis and assessment method is capable to achieve a significant reduction of the time of preparation and making decisions in a wide range of law enforcement activities.

Instead of Conclusion

The complexity of dynamically changing tactical interests within the entities of larger groups of interests and also between systems of strategic interests is exponentially growing. Traditional approaches, technics and methods are already outdated since the multiplying challenges and new target areas

spread over and affect new field of life in every country. It would also be worth some scientific researches which will analyze the dynamism of the changes of interests, but it must be a task for scholars devoted to political sciences. We, who took our oath to serve, defend and protect the citizens, we are always behind the criminals and always react only when we are informed about something challenging our competence. It means one of the main goals of law enforcement bodies, the prevention of any possible kind of crime becomes more and more difficult. What our measures have to be if the act clearly harming public interest has not been codified yet? We perceive it is a crime but legally we are unable to apply the tools we are entrusted with. These cases are part of a permanent and sad learning. Our efforts may be useless unless the lawmakers, the governmental bodies not only understand the growing threat but also become active participants of the learning process, listen to our experience and use their legal position to reduce the reaction time between the criminal world and the law enforcement forces, between the committed crimes and legal sanctions.

Our colleagues from other countries are learning something each new day. They perceive, analyze and assess what they see, hear and experience on duty. They are overloaded; they have piles of files on their desks with problems of human beings like themselves to be solved. The officers, the lawmakers, the citizens need a new approach, a new tool, a new way to increase the security and safety, to reduce the risk of harmful activities for the societies. Let us think out of the box, let us give them this tool!

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THE SPECIAL TOOLS OF THE CRIMINAL POLICE IN THE PREVENTION OF HOMICIDE

Béla Árpás[1]
Faculty of Law Enforcement, Ludovika University of Public Service, Budapest, Hungary

Every human life is unique and unrepeatable!
Pope Francis

INTRODUCTION

As a professional member of the police, I have served for nearly twenty years in the field of life protection. I have participated in many investigations and was in charge of several investigations based on the crime of taking another person's life, the crime of preparation for murder.

RESEARCH

I focused my research on homicide and its special, preparatory phase, since, as I have already written, I have gained practical experience in it over the years. For my work, I partly chose the method of qualitative research based on descriptive and interview techniques, since, in my opinion, this is the best way to convey the legal regulations and, with it, the challenges of the Hungarian investigative authority. In addition, I also included the quantitative method, for the purpose of comparative analysis, I obtained and analyzed official statistical data, examining the correctness of the obtained opinions.

As a hypothesis, I stated that the effective criminal material and procedural law environment both enables the prevention of homicides and the application of just sanctions against the perpetrators.

HISTORY OF THE CRIMINAL LAW OF HOMICIDE IN HUNGARY

At the birth of the Hungarian state (A.D. 996), at the dawn of the development of Hungarian law, King Saint István accepted the teachings and admonitions of the Bible by converting to Christianity. Thereby - according to the Christian religion - derived from God, the fifth sentence of the Ten Commandments engraved on the stone tablet of Moses: "Do not kill!" was also accepted as his commandment. King Saint István II in his decree already provided for the murderer and his punishment, even though the value - and thus the extent of the punishment - was different for a free person than for a slave. In the case of a free man, the punishment was simple: "If anyone kills a man with a sword, let him be killed with the same sword" (Code of King St. István 1038) (URL1). In the case of slaves, the purpose of punishment was financial compensation rather than sanctioning.

1 arpas.bela@uni–nke.hu

Act no. C of 2012 on the Criminal Code (hereinafter refereed to as CC) (Magyar Közlöny 92. 2012) defines the basic case of homicide as a general guardian of human life, not tied to the method of commission, as an open fact. "*Anyone who kills another person is punishable by imprisonment from five to fifteen years for a felony*" (160. § of the CC). The legislator defines twelve more serious cases and some less privileged cases. More serious cases (planning in advance, harming several people, etc.) can be punished with life imprisonment, while privileged cases are subject to a lighter punishment.

The open legal situation and the dozens of classified cases already suggest that the picture of the commission of homicides is extremely heterogeneous, which is why it can be typified and grouped based on a number of ways and aspects.

Prominent among the groupings is the determination of the perpetrator's motive, motivation, or goal, which is often difficult, even in the case of crimes that have reached the experimental stage. It can be especially true in the case of acts that are only in the preparatory course, since in many cases the offender's state of consciousness does not appear in the outside world, or only in small traces, so there are subjective and objective obstacles to knowing the motivation.

CRIMINALIZATION OF PREPARATION AND PREPARATION FOR MURDER

Regarding the medieval history of preparatory behaviour, Barna Mezey (2004) wrote that "*legislation and legislative practice could and did pay attention to the stages of the commission of the crime, especially in the case of the most serious crimes. The threat of a crime was punished in only one case: when setting the prospect of arson*" (Mezey, 2004: 173).

Until the 18th-19th century, there was no example of responsibility for results in connection with preparatory stage. In the first Hungarian CC created by the soldier, judge and jurist Károly Csemegi, 288. § of Article nr. V of 1878 defined the preparation of homicide as follows:

"Conspiracy to murder, with preparation,

He received two years in prison as a worthy punishment."

(288. § of Article nr. V of 1878. URL2)

The focal point of this study is the crime of preparation for murder. CC (3) of 160. § contains a criminal offense which, according to the effective material law, is punishable by imprisonment from one to five years. The legislator orders the preparatory behavior to be punished only in the event that the specific facts of the case provide for criminal liability. Based on this, anyone who, in order to commit the crime of the given special circumstances, ensures the necessary or facilitating conditions for the commission of the crime, invites, recommends, undertakes the commission of the crime, or agrees to commit it jointly (CC. 160.§).

In addition, it cannot be punished for preparation if the perpetrator voluntarily abandons his intention and because of this the commission of the crime is not started, nor is he who retracts his verbal statements, which are otherwise considered preparatory behaviour, or tries to get others to refrain from committing the act. However, it is a conjunctive condition that the commission of the crime is not started for any reason. Finally, the person who reports the preparation to the authorities before the commission of the crime will be exempted. The only exception is when during the preparation another crime is commited. In this case, the offender may be punished for this (CC. 11.§).

Observing the changes in the penal code, it can be seen that the preparatory acts are criminalized, bringing the crime forward in time in the 20th century. Increasingly widespread, it can be observed mainly in terms of new facts. According to Róbert Bartkó and Zsolt Homora, the reason for this is to be found in criminal law policy, in the incorporation of European Union and international legal obligations into domestic law (Barkó & Szomora, 2023).

THE INVESTIGATION IS IN THE PAST

Until five years ago, the procedures ordered for the crime of preparation for murder to be typically carried out in two ways, depending on the complexity – and regardless of whether they were acts manifested in actions or only in the communication of thoughts.

The crimes with a simpler judgment were carried out in an extremely rapid manner using traditional criminal methodological tools and methods. The victim and the witnesses were interrogated, the behaviour, and statements made by the perpetrator that could be linked to the crime, as well as the possible motive. After that, the authorities – occasionally using demonstrative, exaggerated and deterrent force – arrested, prosecuted the perpetrator, and interrogated him as a suspect. If necessary, the (house) searches were conducted and objects seized, and then the material evidence was subjected to expert examination. In a significant part of the cases, personal means of proof were dominant. After that, the case was sent relatively quickly to the competent prosecutor's office with a proposal for indictment. This is how the thesis of forensics regarding the effectiveness of the deterrent power of inevitable punishment prevailed, the perpetrator, aware of the certainty of being caught, renounced the criminal intentions (Barabás, 2020: 256). I must add that the interests of the criminal justice system were less effectively enforced in these cases, according to my interviewees and my own experience, some of the proceedings were terminated due to the lack of evidence or indeed a crime.

The other detection method of the era was much more sophisticated, and was used by the investigative authorities specifically in more complicated cases. According to the model, in addition to the traditional, conservative investigative tools, the investigative authority deployed various special, secret tools. Most of the time, surveillance, the use of undercover detectives, and the use of wiretaping for weeks or months were the tools that represented the solution. This method of investigation and detection provided sufficient means of proof in the event of real intent to kill. This type of detection method, in addition to preventing the crime, led close to a 100% conviction. The challenge was the control of the potential suspect and thus the situation, the protection of the victim and the binding of the capacities associated with these tasks.

In the course of my research, I conducted interviews with intelligence officers, detectives and investigators, managers and senior managers working in the field of life protection in six counties, and reviewed the documents of fourteen ongoing cases. All interviewees stated that the latter solutions rarely occur in our time, and most of them have become unnecessary.

One of the main reasons for this is the Kuria Penal Jurisprudence Council nr. 3/2019 (hereinafter "PJC") legal unity decision wich contains that "*declaration of intent to commit a crime without invitation may also be suitable for establishing the crime*" (PJC, 2019).

Active preparatory behaviour manifested in actions (e.g. spoiling a car's braking system, purchasing poison, weapons, mapping a location, etc.) is a simpler task.

"Inviting" or "recommending" another person to commit a crime is a one-sided activity that can ultimately be linked to another person. However, the "agreement to commit jointly" is no longer just a one-sided act between two people. These are clear forms of behaviour, their proof, if not as simple, is less difficult than "undertaking" to commit a crime, which in common parlance only meant the undertaking of an activity.

On October 7, 2019, the Criminal Legal Unity Council of the Kúria issued the above-referenced legal unity resolution regarding the fact that "undertaking" does not only mean accepting an invitation or offer made by someone else. According to the guidelines, an "undertaking" is also when someone decides to carry out his will, or even his already formed plan, i.e. killing another person. Based on the position of the Court, a communication of thoughts expressing the serious determination of the specific crime, reaching the addressee and showing the determination of the intention in it, corresponds to preparatory behaviour.

This would have made the proof much simpler, however, since each word can have multiple meanings, or can even be evaluated differently in different cultural circles, even in everyday life purely emotional revelations without actual intent to kill can appear, so establishing the truth is still not so easy.

The situation is complicated by the CC. The offense of harassment described in 222. § (2), which differs only in its purpose from the verbal invitation or attempt to prepare for murder, because the purpose of harassment is merely to create fear. This also shows how important it is to examine the perpetrator's intention and state of consciousness.

One of the main reasons for the sanctioning that can be observed in substantive law, approaching the origin of the idea in time, such as the increase in the number of preparatory facts, as well as the issuance of the above-explained unified criminal law resolution, is mainly the social expectation that, instead of reactive law enforcement, specifically proactive, preventive actions should be taken. This is especially the case with aggressive acts that involve even the taking of human life, since the preventive action taken at the time would not be possible without legal conditions, and prevention would not be effective.

The specific crime prevention activity is promoted by the Act nr. XC of 2017 on the Criminal Porcedure (hereinafter "CP") (Magyar Közlöny 99. 2017) since July 1 of 2018. In contrast to the previous regulation, the legistrators fully integrated it into Criminal Porcedure Act. Within the framework of the criminal procedure, a new, special, pre-investigation procedure called the "preparatory" procedure was introduced, the purpose of which is to determine whether a crime is suspected (CP 340.§).

In the new system, many data collection and covert devices could be used. It is also forward-looking that the evidence obtained during the preparatory procedure can be easily used as full-value evidence. The legislation thereby made the criminal procedure particularly proactive, prevention-centric, economical and faster for the investigating authorities.

THE INVESTIGATION IN THE PRESENT

In the next phase of my research, I examined the frequency of homicides. As primary information, I used the OSINT tool and the Internet as a source, since homicide is such a deeply serious anti-social behaviour that inevitably attracts the attention of citizens. And what interests the population is the news. News that can be turned into money has media value, that is, it can be sold in the media. Following this train of thought, investigating the question, I conducted an internet search out of sheer curiosity, using the www.google.com search engine. I have found that between January 1, 2019 and

December 31, 2023, the commonly used term for homicide, the word "murde", appears in a total of 1,510,000 publications in Hungary (URL3). That is more than 1,000 impressions per day…

I was more and more interested in the question, so I looked up how many Hungarian news portals published news in which the above word was found. There were few sites that published the exact amount of hits, but ATV (4980) (URL4), RTL (7520) (URL5), and Blikk (19,500) (URL6), were like that. I knew that there were nowhere near that many murders, but in order to establish the exact numbers, I made a request for data to the Analytical and Evaluation Department of the Crime Department of the National Police Headquarters, from which I received the official data of the Unified Investigation Authority and the Prosecutor's Office Crime Statistics.

Table 1. *Data on All Registered Crimes, Homicides, and Procedures for the Preparation of Homicides*

év:	**2019**	**2020**	**2021**	**2022**	**2023**
(A) all registered crimes	165,648	162,416	154,012	167,774	178,172
(B) number of homicides	129	177	133	193	162
(C) number of negligent homicides	12	1	8	9	4
(D) number of completed (intentional) homicides	56	72	65	81	65
(E) attempted (intentional) homicide	55	89	62	97	83
(G) preparation for (intentional) homicide	6	15	14	24	10
(H) all intentional homicides: (D+E+G)	117	176	141	202	158
(I) the proportion of homicide preparation in relation to intentional homicides (H:G)	5.12%	8.52%	9.92%	11.88%	6.32%
(J) the ratio of total intentional homicides to total crimes (H:A)	0.070%	0.108%	0.091%	0.120%	0.088%

/Source: GPD CD CID Criminal Analysis and Evaluation Department, own edit/

It can be seen from the above that the ratio of intentional homicides to all crimes is around 0.1%, which means that out of the 8,282-8,908 investigations ordered per county each year, the specialized units have to deal with a total of 5-8 such cases. Of course, this is an overall indicator, the workload of each county shows significant differences. While a total of 137 cases occurred in the capital during the examined period, and 102 in the agglomeration, the next highest figure is less than half of this (47), and the lowest is 9 cases in the examined four-year time interval.

In terms of the number of homicides, Hungary is in the middle segment with 0.8% per 100,000 inhabitants, between Luxembourg and Malta. Regarding Serbia, this data is 1.1866 (URL7).

Since in the past period my profession moved in a different direction from the area of life protection, therefore, after learning the figures, I wanted to learn the forensic characteristics of today's investigation (or preparatory procedure). I also started this first by processing the written data, this time the literature. I present the investigation in chronological order, the way the events take place in real life, starting from the basics of the procedure, through traditional tools to special tools.

THE START OF THE CASE

How does a homicide investigation begin? In the course of their work, Lajos Kovács and his colleagues came to the conclusion that, in general, in the case of homicide, the authorities can learn about the crime from the following sources:

1) Discovery by a witness
2) Healthcare institution, expert institute
3) Notification of suspicious death of relatives
4) Indication of sociability
5) Direct detection by authorities, prosecution
6) Secret information collection data
7) During the investigation of a disappearance or extraordinary death
8) Investigation of other crimes
9) Voluntary application (Kovács-Boi-Girhiny, 2022).

And this typology holds its place entirely in the case of homicides that have reached at least the experimental stage. However, in some cases, as I have already outlined in the communication of ideas, the preparation of homicide appears, or it can be inferred from a seemingly ordinary act, or from the commission of a punishable but non-homicidal crime (for example, the acquisition or possession of illegal firearms, explosives). Due to the peculiarities of the actions in the preparatory course, several detection opportunities are therefore cancelled.

My interviewees told me that information about the intentional commission of the preparation of a homicide is usually generated during some kind of official procedure. In addition, another source of knowledge is the perception and indication of a natural person. Based on these, the following typology can be outlined for ordering an investigation:

1) detected during other, ad-hoc measures
2) another procedure
   a. public investigation, or
   b. secret information collection,
3) information of a natural person
   a. the relationship of the criminal circle, or
   b. based on the indication of one of the perpetrators.

Ad 1) In some cases, during an open police or other official action, the law enforcement, uniformed personnel detect or establish a fact that raises the suspicion of a crime.

Ad 2)

a. It also happens that an investigative authority acting in other cases conducts a search (house search) as an open, criminal procedure measure, during which material evidence is found that can ultimately lead to establishing the suspicion of preparation for murder (for example, a plan, photograph, internet communication, weapon, etc.).

b. In some cases, through the use of a covert device used in the framework of the reconnaissance activity carried out by another investigative authority (for example, during the wiretapping of members of a criminal organization), the investigation obtains information and evidence that raises the suspicion of the crime of preparation for murder.

Ad 3)

a. However, in everyday life, it happens that there is a person either in the environment of the perpetrator or the instigator, who learns about the crime against his will and files a report with the authorities for moral or other reasons. The whistleblower will then be questioned as a witness.

b. But what if the report is made by someone who is a party to the crime, if he was asked to carry out the crime? In this case, criminal material law offers immunity for the already outlined, CP 11§ as defined in paragraph (2) of sec. The exception to this is if the deed committed by the informant up to that point also committed another crime, e.g. illegally bought weapons and ammunition for the commission. In this regard, the current criminal procedure law offers several options, and we have arrived at the new CP, for special opportunities given.

In the case of a person suspected of having committed a crime but not yet under the legal status of a suspect, or in the case of the suspect's confession, participation in the investigation of the crime, or in the evidentiary process, in the event that the interests of national security or law enforcement are more important, the public prosecutor's office has the option of several types, in Anglo-Saxon law to apply a widespread, plea bargain-type consensual solution. Such is the rejection of the report, the termination of the investigation, or the settlement regarding the prospect of the prosecutor's action or decision. The options cannot be used - with the exception of the latter case - if the person involved in the cooperation has committed a crime involving the intentional taking of another's life, or intentionally causing permanent disability or serious health deterioration.

The cooperation can be based on a report on all essential moments of the case (continuous testimony documenting almost every event) and on the use of the already mentioned and – explained in detail later – as a covert tool. In the latter case, it is possible for the investigative authority to obtain additional evidence of the instigator with the help of the secretly cooperating person, for example using other covert means subject to a judge's or prosecutor's license.

COMPLETING THE INVESTIGATION USING TRADITIONAL TOOLS

During the detection of crimes against life that have reached at least the experimental stage, traditional, classic, non-detailed investigative methods and tools continue to dominate, such as data collection, crime sceen investigaton, autopsy, interrogation, confrontation, research, or various expert examinations.

In the case of the preparation carried out in the acts, although not in the same proportion, an expert was regularly involved in the proceedings, since it is necessary to (house) search the property related to the perpetrator who is preparing to kill with poison, and to carry out a seizure of the instrument of the commission, the suitability of which to take life is determined by a chemist or reviewed by a toxicologist expert. But the situation is the same with firearms or other tools that cannot otherwise be integrated into the criminal's way of life or are capable of taking life.

The application of the special procedural model is mostly necessary for a more sophisticated plan of commission, or for the investigation and proof of a crime committed only by communication of thoughts. In the latter case, since usually only changes occur in the consciousness of individuals, the possibility of using classic investigative tools is much more limited. In the absence of on-site measures and forensic experts, it is natural that the detection and investigation procedure for the purpose of proving intent, personal proof becomes emphasized. Among the classic investigative tools, witness and suspect questioning, presentation for recognition and confrontation come to the fore. The problem is that these means of proof, or doubts may arise regarding the validity of the evidence provided by them, for example the credibility of the witnesses, so the investigation becomes a three-tiered investigation; crime prevention, obtaining evidence and supporting evidence with almost the same capacity. That is is the exact reason why the use of special, concealed tools is necessary.

COMPLETING THE INVESTIGATION WITH SPECIAL, COVERT TOOLS

I have already mentioned that the current normative environment allows intelligence agencies to use secret, so-called covert tools that seriously violate basic constitutional rights in order to fulfill their tasks.

Given that the use of these hidden devices involves the restriction of basic rights related to the inviolability of the private home and the protection of privacy, correspondence and personal data, the legislator has therefore defined a three-level authorization in relation to the use of the devices, proportionate to the infringement of the rights. According to this, they are:

- not subject to a judge's or prosecutor's license
- subject to a prosecutor's license, and
- subject to judicial permission.

The most important principles of using the tools are:

- necessity – it can be reasonably assumed that the information or evidence to be obtained is absolutely necessary to achieve the goal of the criminal proceedings and cannot be obtained in any other way, or can be obtained at the cost of significant difficulties;
- proportionality – the application of the concealed device does not entail a disproportionate restriction of the fundamental right of the person affected by it or of another person, and
- purposefulness – it is possible to obtain information and evidence related to a crime by using the concealed device (Szendrei-Nyeste, 2019: 96-97).

In the next part of my article, I would like to highlight the special, hidden tools that are most relevant in such cases.

A Secretly Cooperative Person

A body authorized to use covert means can use a person who cooperates secretly in order to obtain information about the crime (CP 215.§ (1)).

A prosecutor's or judge's license is not required for the application. As I wrote above, the authorities may receive information about the planned commission of the crime during official proceedings or

for natural persons. In the latter case, the information can be provided by a person previously completely independent of the authorities - who cooperated in the case on an occasional basis - or by an "informant" in the everyday sense, who has been cooperating with the intelligence organization for a long time. Since the beginning, societies have employed persons who ensure the acquisition of the necessary information in order to obtain information important to them. This is not the case today or in Hungary. The legislature also made it possible for law enforcement agencies to employ secret collaborators both within the framework of general intelligence supporting law enforcement and crime prevention, as well as within the framework of specific information - and evidence-gathering activities related to criminal proceedings.

However, the use of the information obtained by the collaborators, and thus the role of the collaborator in the procedure, is extremely situational. An important circumstance is the state of progress of the case, the level of danger, the method of committing the crime, or the determination of the perpetrator.

If the procedure requires it and the collaborator is in such a situation, it can be used as a covert tool in the further stages of the investigation, as a continuous source of information supporting the investigation in various ways, or even as an evidence-gathering and evidence-generating tool.

Not at the time of application – but based on the principle of equality of arms – after that the relevant part of the documents is definitely burdened or it is also known to his defender. If personal data is not included, but based on its content information – after the operation – the identity of the collaborator will most likely be deconspirated. In the event of possible difficulties in proving, it may also be necessary to interrogate the secretly cooperating person as a witness. In this case, the procedural law allows the witness's data (including his name) to be handled in private, but since this solution is not sufficient in all cases, the law provides additional options and provides for special treatment, the legal institution of the especially protected witness, on personal protection, as well as within the witness protection program.

Disinformation

By concealing the source of the information, the body authorized to use covert devices may communicate untrue or misleading information to the person affected by the covert device due to the interruption of the right, the identification of the rightful owner, or the proof (CP 215.§ (7)).

The application of this tool also does not require external permission. Its purpose is to elicit some kind of reaction from those involved, thereby influencing their behaviour in a favourable direction – from the tactical point of view of the investigation.

Delivering sufficiently chosen misleading information to the right person at the right time under the right circumstances can trigger the intended reaction. The use of disinformation on its own and the detection of reactions with other covert means can give rise to a tactical and procedural advantage that can significantly facilitate the evidentiary process.

By law, the procedure cannot be used for disinformation during interrogation, it cannot contain promises that are incompatible with the law, it cannot implement threats or incitement to commit a crime.

Covert Surveillance

A body authorized to use covert means may secretly observe a person, apartment, other premises, fenced-in place, public or open to the public, or vehicle, or things constituting physical evidence,

which may be associated with the crime, collect information about what happened, and technically you can record it with a device (CP 215.§ (5)).

Secret surveillance is at least as old a tool that does not require external authorization as the use of informants. And I must say that it is at least as useful. There is no secret procedure in which this elementary tool is not used, since by using it, the authorities can get a lot of information that they cannot get in other ways. However, it is also an extremely expensive and dangerous tool. Its cost is the provision of technical equipment (procurement, maintenance, operation) as well as the training and maintenance of the staff. Part of the danger is the participation in traffic, often breaking the rules, and the ever-present possibility of de-conspiracy.

Monitoring the perpetrator of the acts in preparation, be it the instigator or the perpetrator, is the guarantee of the prevention of the crime. At the same time, maintaining this indefinitely is not possible due to the scarcity of resources, their correct management, and the enforcement of the triple principle of necessity and proportionality.

That is why choosing the target person for covert surveillance and determining the exact time and period of application is a key professional issue. Through monitoring carried out on a well-chosen occasion - for example, when disinformation is being targeted - the authority cannot only obtain information, but also obtain evidence, the authority can get to know the identity of the perpetrator or the instigator, and can also find the hidden means of committing the crime. And since it is merely an observation of the events, it does not influence the behaviour of the perpetrator, so there could be no doubt about the impartiality of the application of the tool.

The use of the hidden devices explained below has already been tied by the legislator to a license from the prosecutor, outside the police authority, as a kind of guarantee element. The reason for this is the legal complexity of the application and the weight of the legal consequences associated with the application, in addition to the degree of restriction of fundamental rights. As in the previous ones, in this case too, I am writing about the tools that are most common in practice.

The Prospect of Avoiding Criminal Liability

With the permission of the public prosecutor's office, the body authorized to use covert devices can enter into an agreement with the perpetrator of the crime, in which it offers him the prospect that no criminal proceedings will be initiated against him, or that the ongoing criminal proceedings will be terminated, if he provides information and evidence related to the detection and proof of the case or other criminal case, and the national security or law enforcement interest achieved by the agreement is more significant than the interest related to the criminal prosecution of the perpetrator. No agreement can be entered into if the perpetrator is to be prosecuted for a crime with which he intentionally took the life of another or with which he intentionally caused permanent disability or serious health impairment (CP 219.§ (1) – (2)).

In common usage, this is the so-called plea bargain. As I already mentioned above, the basic, starting information of the investigation can come from a person who is himself among the perpetrators of the crime, for example the requested "hitman". Based on what was learned during the research interviews, it is more typical that a suspect who is not involved in the homicide case - or his legal representative - indicates during other ongoing criminal proceedings against him that he is aware of the preparation of an ongoing homicide. The purpose of providing the information is clearly to avoid criminal liability.

Undercover Detective

A body authorized to use covert means may use its member who permanently conceals his membership or identity and is employed specifically to perform such a task in criminal proceedings with the permission of the public prosecutor's office. The undercover detective can be used in conjunction with other covert devices, or for its successful application (CP 222.§ (1)).

The practice of recent years shows that the use of an undercover detective is extremely successful in detecting homicide and the preparation of homicide. In preparatory cases, the undercover investigator typically plays the role of an assassin, since the undercover investigator can neither induce others to commit a crime, nor can he lead the person concerned to commit a more serious crime than the one he originally planned to commit.

An extremely striking example of the successful use of an undercover investigator is Dr., the case of Sándor S., who decided because of a previous loan deal, to kill three members of the family. The former lawyer wanted to entrust the crime to a construction contractor, who apparently accepted the commission of the crime, but filed a report with the investigative authority. In the future, the "assassin" agreed to cooperate, and with his cooperation, audio recordings were made that supported the determined intention of the instigator, using other covert devices subject to judicial permission. The police cracked down on the instigator when he shared the exact plans with the "hitman" and even gave photos of the victims. Given his old age and health, the instigator was released relatively quickly from the measure restricting his personal freedom, but by this time his partner had left him. At that time, in the mode of execution, he forged a plan extremely similar to the previous one, to kill his partner who had previously left him, and entrusted two imprisoned persons with the execution. The two persons apparently also admitted to the crime, but they also filed a report with the police. Their cooperation opened the door to the introduction of undercover investigators as experienced "hitmen". The undercover detectives recorded the instigator's communications and even took the negotiated advance. At that time, S. Sándor was arrested again, but this time for a longer period of time. He denied his guilt in court, but both the audio recordings and the cash he handed over clearly proved his guilty intent. Based on this, the court sentenced him to three years and six months in prison for the crime of preparation for murder in four counts, in one case committed continuously.

The example shows that the use of an undercover detective is an extremely effective tool. By the fact that the undercover detective apparently undertakes the execution of the crime, he ensures the control by which the investigating authority becomes able to prevent the commission of homicide. On the other hand, it also provides sufficient evidence for judgment certainty.

I have already mentioned that the CP is extremely innovative. This can also be seen in connection with the use of tools that most violate fundamental rights and are hidden under judicial permission, since the relevant rules have been clearly and comprehensibly laid down. The legislator implemented the issue of proportionality in the procedural law in such a way that, with a few exceptions, special tools subject to a judicial license are only allowed in the case of serious crimes that are punishable by at least five years in prison.

Wiretaping

With the judicial permission of a body authorized to use covert devices, it can secretly learn and record the content of communications carried out via an electronic communication network or device, or on an information system within the framework of an electronic communication service.

The first subscriptions, which have now almost completely replaced landline telephones, began to be sold in Hungary in 1990 by the monopoly Westel Rádiótelefon Kft. According to the Central Statistics Office, in 2023 there were 1,043.3 mobile subscriptions for every 1,000 people (URL8).

Wiretapping, as a means of gathering secret information, plays a significant role in intelligence activities. The police use the tool of wiretapping annually in thousands of cases, which was also supported by the statements of my interviewees. Eavesdropping is, of course, getting to know the communication between two parties, recording the communication between the two, from which it follows that eavesdropping is more effective in the form of social perpetration. Of course, even in this case, the success of the device is not certain. Because in our age, trained, careful, or even paranoid criminals do not share essential information on mobile phones. Therefore, today, through wiretapping, the authorities do not necessarily obtain direct evidence, but intelligence information can be generated, for example, about the perpetrator's network of relationships, personality, daily activities, and plans. At the same time, there is also the real possibility that the identity of the instigator or executor, the place and time of their meeting become known, which, depending on the operational situation, can be documented by the intelligence agency using other means (surveillance, an undercover investigator, or a secretly cooperating person).

According to the unanimous opinion of my interviewees, the information obtained during the eavesdropping can help the authorities to recognize in time and establish the real intentions regarding the preparation of the crime, thereby preventing the commission of the crime.

Secret Surveillance of an Information System

With the judicial permission of a body authorized to use covert devices, it can be secretly learned about the data managed in the information system, and it is possible to record the detected data with a technical device (CP 232.§ (1)).

The Internet is among the technical achievements of the 20th century. Today, it is normal that communication takes place via various applications, typically installed on mobile phones. According to the data from the Central Statistical Office, 89% of the 16-74 age group use the Internet on a daily basis (URL9). This meant 1.3 billion terabytes of data in 2023 (Barkóné Dobos et al. 2024: 128).

The practice shows that both average users and criminals are increasingly switching to Internet-based communication. Communication on this platform is more open and careless, since the chat applications work with continuously developed encryption systems that provide users with the possibility of safe, unmonitored communication. This presents a real challenge to the authorities, and in many cases the knowledge of the communication becomes possible only after the seizure of the technical device, but then it is considered particularly weighty evidence.

As I mentioned above, in addition to the outlined tools, the authority has the possibility of using many other special tools, but the ones explained above are the ones that the investigative authority uses most often and most effectively.

RESULT AND JUDGMENTS

As I wrote above, criminal material law orders a five-year prison sentence for a person who commits the preparation of murder. Based on the BJE outlined above, it is also possible to express the thought to the addressee.

My interviewees said that, according to their experience, the court considers the criminal intent extremely seriously. The trial courts pass judgments that are reprimanding but take away personal freedom, or that represent a real sanction, only in cases with a statement of thought but not realized in other actions. On the other hand, in cases of preparation for actual, determined homicide, the court regularly imposes a penalty of actual deprivation of liberty within the legal framework.

CONCLUSION

In the course of my research on the crime of preparation for murder and my own professional activities, I have found that the investigation of preparation for homicide - especially in the reconnaissance department before questioning the suspect - imposes an above-average, significant responsibility on the members of the acting authorities.

This additional professional and moral responsibility stems from the duality of the task. The primary goal, which overrides everything else, is to save the life of the person in danger. This is coupled with the enforcement of society's criminal law demands, i.e. the effective and legal conduct of criminal proceedings against the perpetrator or perpetrators.

In the majority of cases, the investigation into the preparation of a homicide is a fast, decisive investigation, but does not require special solutions. The electricity that was led into the fence, the "death list" posted on social media by a student who was offended or maybe struggling with mental problems, or the "You'll die!" sent to the website of an antipathetic politician before elections, but message does not necessarily mean serious intent to kill.

Since the facts are not sufficiently clarified at the beginning of the procedure, the mental state of the perpetrator and the seriousness of his intentions are not known, therefore the authorities do everything possible to prevent and prove the crime. The identification of the unknown perpetrator usually does not pose any particular difficulty, even if the perpetrator lives with the anonymity provided by the Internet. The identification and capture of the culprit is followed by a (house) search, interrogation of the suspect and, in many cases, an examination by a psychologist or mental health expert, which serves the noble goal of serving justice.

In the cases in which the perpetrator's determination and possibly the social pattern of crime, the organization, the higher degree of the crime, or some more complexity for other reasons, the police respond using more sophisticated methods.

In the course of my work, I have come to the conclusion that the police have all the necessary tools available for those cases where, for some case-specific reason, the establishment of the facts is more complicated, or difficulties arise in the field of detection and proof. In connection with this, the procedures designed to protect witnesses and the cooperation of law enforcement authorities, even at the international level, are particularly important. Unfortunately, this is not sufficiently elaborated in relation to persons cooperating secretly.

In addition, it can be stated that the legal environment, be it criminal law or criminal procedure law, and thus the storehouse of special tools, provides the authority with a sufficient toolbox for effective prevention and the correct determination of guilt.

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FROM WASTE TO LATENT TRACES VISUALIZATION: THE APPLICATION OF POLY(ETHYLENE TEREPHTHALATE)-BASED POWDERS IN DEVELOPMENT OF LATENT FINGERPRINTS

Nemanja Vučković, PhD[1]
University of Criminal Investigation and Police Studies, Belgrade, Serbia

Nevena Prlainović, PhD
Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Nikola Milašinović, PhD
University of Criminal Investigation and Police Studies, Belgrade, Serbia

PURPOSE

Polymers are natural or synthetic, organic or inorganic compounds that possess numerous specific properties. They are among the most utilized materials, due to their versatile and cost-benefit properties, particularly their high durability and strength (Young & Lovell, 2011). Molecular structure, low density of repeating units (monomers), strong (covalent) bonding, structural organization and additives/reinforcements together provide specific properties of polymers, suitable for application in different industries (Carraher Jr, 2017). Polymers consist of long chains of monomers, typically lightweight compared to their volume, which contribute to the low specific gravity of these materials. Besides being lightweight, the strong covalent bonds formed between the monomer units contribute to the high strength-to-weight ratio of polymers. These properties have influenced the extensive usage of polymers in many fields, although their lifespan often exceeds the needs of the application (Mikitaev, Ligidov, & Zaikov, 2006). They can also be combined with other compounds to obtain a desired material for a specific application (van Krevelen & te Nijenhuis, 2009).

Based on their chemical structure and response to heat, polymers are classified as thermosetting and thermoplastic (Massy, 2017). Thermosetting polymers or thermosets undergo a chemical reaction when heated, creating a three-dimensional network of bonded molecules (Pascault & Williams, 2013). This process is irreversible, meaning that once thermosets have been set, they cannot be melted or reshaped. Therefore, these materials can be recycled only through chemical degradation of their three-dimensional structures, where mono-oligomers and/or fillers are recovered at the end of the cycle (Morici & Dintcheva, 2022). Thermosets are typically hard, strong, and have excellent resistance to heat and chemicals, due to strong chemical bonds and crosslinked chains formed during the curing process (Pascault & Williams, 2013). Some common thermosets include melamine, epoxy resins, polyester resins, silicone, urea-formaldehyde resins, polyurethane, polyvinylidene fluoride, etc. (Mamunya & Iurzhenko, 2012; Pascault & Williams, 2013; Massy, 2017). On the other hand, thermoplastic polymers or thermoplastics are solids at room temperature that have linear molecular chains. Upon heating, they become soft but hardened when cooled since there are no chemical bonds involved. These polymers could be poured into moulds to cool and solidify into desired shapes (Van de Velde &

1 nemanja.vuckovic@kpu.edu.rs

Kiekens, 2001). Additionally, they can be reheated, recycled, and remoulded without any risk to their material properties. Polycarbonate, polyethylene, polystyrene, poly(vinyl chloride), polypropylene (PP), poly(ethylene terephthalate) (PET), and polytetrafluoroethylene are typical thermoplastic polymers. These materials have been used for plastic injection moulding, extrusion, and thermoforming processes, and generally tend to resist shrinking while offering good strength and elasticity (Van de Velde & Kiekens, 2001; Heckele & Schomburg, 2003; Bîrcă, Gherasim, Grumezescu, & Grumezescu, 2019; Dhinakaran, Surendar, Hasunfur Riyaz, & Ravichandran, 2020).

Polymeric materials have been used for many years in various industries, including packaging, agriculture, silviculture, fishing, water and waste treatment, electronics, automotive, medicine, dentistry, and pharmacy (Milašinović, Knežević-Jugović, Milosavljević, Filipović, & Kalagasidis Krušić, 2012; Namazi, 2017; Vallejos, et al., 2022; Khah & Soleimani, 2023; Vučković, et al., 2024). For example, nylon, aramid, polyester (PET), and poly(vinyl alcohol) have been widely used in synthetic fibre manufacture for textiles. Various countries have moved away from paper currency and manufacture money from polymer films (generally PP), due to longer lifespan and cleanliness. Polymers have also been used for personal protective equipment, car parts, paints, glues, household items, lubricants, packaging, containers, etc. (Namazi, 2017; Al-Ghraibah, Al-Qudah, & Al-Oqla, 2020; Bhagyaraj, Oluwafemi, & Krupa, 2020; Kumar, Verma, & Khare, 2021; Vallejos, et al., 2022; Khah & Soleimani, 2023).

However, the massive production and consumption of polymeric materials have led to the generation of huge amounts of polymeric (plastic) waste. The annual growth in global polymer production has surpassed global gross domestic product and population growth (Coates & Getzler, 2020). As a consequence, polymeric materials can be found everywhere – in air, soil, water and/or biological organisms. High durability and strength, which are beneficial for their exploitation, represent huge flaws upon cessation of their application, as these materials are being thrown into landfills, thus polluting the environment (Da Silva & Wiebeck, 2020; Valerio, Muthuraj, & Codou, 2020; Prlainović, Milovanović, Milašinović, Bezbradica, & Mijin, 2024). Therefore, environmental scientists and other researchers are attempting to develop sustainable recycling technologies for polymeric waste, but these still remains a significant challenge.

There are several methods/approaches used for the mechanical recycling of thermoplastic polymers. Primary mechanical recycling involves direct reuse of uncontaminated discarded polymer as a new product, with initial/unchanged properties. In most cases, primary recycling is conducted by the manufacturer itself for post-industrial waste, often referred to as closed-loop recycling (Al-Salem, Lettieri, & Baeyens, 2010; Baillie, Matovic, Thamae, & Vaja, 2011). Since exact content and purity grade of end-of-life and post-consumer streams are usually unknown, polymers are processed through secondary mechanical recycling, which includes separation and purification. The polymer is not changed during the secondary recycling, but its molecular weight decreases due to chain scissions in the presence of water and small volumes of acids, which can cause the weakening of mechanical properties (Achilias, 2012). Feedstock or tertiary recycling involves the conversion of polymeric chains to smaller molecules through chemical processes, such as hydrolysis, pyrolysis, hydrocracking, and gasification. Typical conversion products are liquids and gasses, which can be used as feedstock for the production of new polymers, fuels, chemicals, etc. (Patel, von Thienen, Jochem, & Worrell, 2000; Brems, Baeyens, & Dewil, 2012). Biological degradation could be used as an improved form of the tertiary recycling, as considered by some research groups (Hopewell, Dvorak, & Kosior, 2009; Li, et al., 2013). Some polymers can be degraded in the presence of air and water (Mülhaupt, 2012) into smaller molecules by bacteria (Cho, Moon, Kim, Nam, & Kim, 2011), fungi (Schnürer & Schnürer, 2006), and other microorganisms that biosynthesize relevant enzymes (Gross & Kalra, 2002). This form of degradation clearly maintains the intrinsic value of waste materials and returns them into the biological cycle (Ignatyev,

Thielemans, & Vander Beke, 2014). Finally, incineration, or quaternary recycling is especially used for processing mixed and heavily contaminated wastes that cannot be easily and/or economically recycled by other methods. Burning high-energy waste can create heat, electricity, or other forms of energy, which can be used directly in technological processes or for heating buildings. This method reduces waste volume to roughly 1% of the initial volume and decomposes toxic and contagious waste (Al-Salem, Lettieri, & Baeyens, 2010). Therefore, incineration is suitable for recycling medical applications and packaging of hazardous materials, while inorganic constituents converted to inert slag through incineration can be used for road construction (Brems, Baeyens, & Dewil, 2012; Grigore, 2017).

Biodegradable polymers represent a class of "green polymers", implying that they do not exhibit detrimental effects on human health and the environment (Vučković, Glođović, Radovanović, Janaćković, & Milašinović, 2020). However, the degradation of such polymers in landfills typically leads to losing the value of these materials, while their decomposition in the oceans could potentially create environmental imbalance (Hong & Chen, 2017). On the other hand, industrial mechanical recycling usually results in a loss of quality. One of the best sustainable solutions is to develop chemically recyclable polymers that not only solve the end-of-life issue of polymers, but also provide a direct approach to establish a circular economy (Shanmugam, et al., 2020; Valerio, Muthuraj, & Codou, 2020). Revalorization of PET packaging material not only addresses a major pollution issue but also fosters a more sustainable and eco-friendly practice. Such a recycling strategy includes either a depolymerization or a repurposing process. Polymer wastes are depolymerized under controlled conditions back to their starting feedstocks that are purified and then subsequently repolymerized to yield high-quality polymeric materials. In a repurposing process, polymer wastes are converted to "building blocks" for new and value-added polymeric materials (Hong & Chen, 2017; Sikorska, Musioł, Zawidlak-Węgrzyńska, & Rydz, 2021; von Vacano, et al., 2023).

In this research, we investigated the depolymerization of PET packaging material (bottles) to prepare powders for developing latent fingerprints. PET is a thermoplastic and one of the most widely used and versatile polymers, but it is also one of the major environmental pollutants (Dhaka, et al., 2022). Although some research groups proposed different approaches of PET recycling and further application of recycled material (Welle, 2011; Pudack, Stepanski, & Fässler, 2020; Jang, Sadeghi, & Seo, 2022; Smith, Takkellapati, & Riegerix, 2022; Li, et al., 2023; Bian, Xia, Xin, Jiang, & Ma, 2024), none have specifically addressed the recycling of PET for the preparation of PET-based powders used for the visualization of latent fingerprints in forensic examination. In this study, powder formulations were obtained by PET glycolysis reaction, using ethylene glycol as a solvent, and zinc acetate as a catalyst. Three different PET packaging materials (bottles with different additives) were used to prepare powders with green, white and blue appearance. The PET-based powders were then used to visualize latent fingerprints deposited onto non-porous (glass) surface. The interactions between components of the prepared powders and potential presence of additives were investigated by Fourier-transform infrared spectroscopy (FT-IR) analyses, equipped with a diamond attenuated total reflectance (ATR) smart accessory. Optical microscopy revealed that the prepared powders consisted of round-shaped particles uniform in size, which enabled their easy adhesion to the sweat and lipid fingerprint residues. We compared the structure and properties of the prepared powders, and assessed the quality of visualization against the commercial BVDA Magnetic Silver powder, routinely used in forensic practice. The results demonstrated that powders prepared from depolymerized PET material could potentially supplement routinely used fingerprinting powders, particularly due to their low price, as they are derived from waste raw material.

DESIGN/METHODS/APPROACH

Materials

Three different PET packaging materials, i.e. green, white and blue bottles with different additives, were procured from local grocery stores in Belgrade, Serbia. Ethylene glycol and zinc acetate were procured from Centrohem (Serbia). Distilled water was used for washing/purification of final products. Except PET, all materials were used without further treatment.

Preparation of PET-Based Powders

The powders were prepared in accordance with the procedure described by Chan and Zinchenko (Chan & Zinchenko, 2022). The PET glycolysis reaction was performed using three different PET packaging materials: of green, white and blue appearance. Ethylene glycol was used as the solvent, and zinc acetate as the catalyst. The ratio of 1:3 (w/w) PET/ethylene glycol was used for preparation of all powders. Specifically, 1 g of green/white/blue PET chips, 3 mL of ethylene glycol, and 0.01 g of zinc acetate were added into a 250 mL round bottom flask equipped with a thermometer and a reflux condenser. The glycolysis reaction was conducted using a heat mantle at the temperature of 150 ± 5°C until all PET chips were dissolved (~ 4 h). The obtained solution was allowed to cool to room temperature, after which the precipitate was collected and resuspended in distilled water. The washed precipitate was then filtrated using a Büchner funnel, transferred to a Petri dish, and subsequently frozen at –19°C. The sample underwent lyophilized for approximately 24 h, at a pressure of 0.1 Pa, with a sample temperature of –49°C and chamber temperature of –68°C. The obtained clumps were ground into fine powders using pestle and mortar and were stored in a desiccator until further application.

CHARACTERIZATION OF PET-BASED POWDER FORMULATIONS

ATR-FTIR Analyses

The ATR-FTIR analyses of obtained PET-based powders were performed using Nicolet iS10 FTIR spectrometer with ATR smart accessory (Thermo Fisher Scientific, USA), in the range of 4000-400 cm^{-1}, at a resolution of 2 cm^{-1}, and at 25°C.

Optical Microscopy

The obtained powders were recorded with optical microscope *Leica FS C Comparison Macroscope*, equipped with the *Leica IM Matrox Meteor II Driver Software Module*. Powders were recorded in dry state, with and without backlighting. Prior to imaging under the microscope, prepared powders were spread over the glass microscopic slides.

Development of Latent Fingerprints

In order to examine the performances of the prepared PET-based powders, fingerprints were collected from one female and two male donors. Each donor used only their right-hand index finger to deposit sebaceous/oily fingerprints onto a glass surface (properly labelled glass microscopic slides). The finger-

prints were applied using a technical scale (force applied to accommodate 100–150 g, per fingerprint). The prints were then stored under laboratory (humid) conditions and developed at different time intervals: immediately after deposition (day 0), after 1 day, 7 days and 30 days. These intervals allowed the traces to dry and reduce the quantity of residues before developing the latent fingerprints. The prepared PET-based powders were applied using a BVDA Squirrel hair brush (BVDA, The Netherlands), and BVDA Magnetic Silver powder (control sample) using BVDA Magnetic brush (BVDA, The Netherlands) (Almog, Cantu, Champod, Kent, & Lennard, 2014). Subsequently, a magnifying glass and optical microscopy were used to determine the ability of binding of the prepared PET-based powders to fingerprint residues and to evaluate the quality of developed fingerprints on the glass surface.

FINDINGS

Obtained formulations were labelled as PET-1, PET-2, and PET-3, derived from depolymerized green, white, and blue PET bottles, respectively. These powders were used to visualize latent fingerprints deposited onto non-porous (glass) surface. Multiple fingerprints were developed on glass substrates to assess the quality and reproducibility of each powder. The formulation PET-2 yielded the best results in visualizing sebaceous fingerprints deposited onto the glass surface.

After preparation, the initial examination of PET-based powders was performed by visualizing latent fingerprints deposited onto glass surface. Figure 1 shows sebaceous fingerprints from one male donor, deposited onto glass surface, left for a few of minutes, and developed using formulations PET-1 (Figure 1, a)), PET-2 (Figure 1, b)), and PET-3 (Figure 1, c)). The prints were photographed with a magnifying glass (×5) under visible light, using a 50 MP camera (aperture $f/1.8$, pixel size 0.64 μm). Fingerprints were recorded with assistance of black background surface for appropriate contrast.



a) b) c)

Figure 1. *Sebaceous Fingerprints of One Male Donor Developed on Glass Surface, Using Prepared Formulations: a) PET-1, b) PET-2, and c) PET-3, Recorded with a Magnifying Glass (×5) Under Visible Light. Fingerprints Were Recorded with Assistance of Black Background Surface*

When observing fingerprints in Figure 1, it is evident that fine and smooth structure of glass surface enabled the development of complete fingerprint images. The results showed that all obtained formulations demonstrated satisfying detection and enhancement of latent fingerprints, by visualizing complete fingerprint images. The powders developed the prints with continuous papillary line flow, probably due to small particles, enabling good contrast and visualization of fingerprint level 1 and 2

features. On the other hand, slight retention of particles in the interpapillary space caused "overpowdering" of fingerprints, probably due to non-uniform distribution of powders' particles, but without significant impact on fingerprint quality and features.

ATR-FTIR Analyses

ATR-FTIR analyses were performed to determine the structure of the prepared PET-based powders, as well as to identify the presence of additives. The aim of analyses was also to investigate the structural differences and/or similarities between the initial PET packaging material and the corresponding powder, with a particular focus on the residues of components used in the glycolysis reaction. PET exhibits some specific bands, which are observed in the spectra of all PET packaging materials and the corresponding PET-based powders, as shown in Figures 2–4, a) and d). A strong peak around 1715 cm^{-1} corresponds to C=O stretching in ketones, while sharp and broad peaks around 1245 cm^{-1} and 1100 cm^{-1} are associated with C–O stretching of aromatic and aliphatic ethers, respectively (Chen, Hay, & Jenkins, 2012; Mecozzi & Nisini, 2019). Peaks around 870 cm^{-1} and 720 cm^{-1} are related to the bending of C–H aromatic and aliphatic bond, respectively (Ruvolo-Filho & Curti, 2008; Ioakeimidis, et al., 2016). Zinc acetate, used as a catalyst, also contains characteristic bands and peaks (Figures 2–4, b)). The broad band at 3057 cm^{-1} is associated with O–H stretching vibrations from intermolecular hydrogen bonding in acetate salt and/or water adsorption, while two weak bands at 2159 cm^{-1} and 1985 cm^{-1} can be related to C–H stretching vibrations of methyl groups (Schlur, Carton, & Pourroy, 2015; Phoohinkong, Foophow, & Pecharapa, 2017). Two bands at 1548 cm^{-1} and 1417 cm^{-1} are attributed to the antisymmetric and symmetric stretching vibration modes of carboxylate anion, respectively. A weak peak positioned at 1056 cm^{-1} can be related to the vibration of C–CH_3 (Zhang, Zhu, Zhang, & Xia, 2008; Wang, Li, Zhou, Zu, & Deng, 2011). The band at 688 cm^{-1} corresponds to the acetate anion scissoring, while band at 618 cm^{-1} is associated with acetate anion twisting mode (Duan, et al., 2008; Phoohinkong, Foophow, & Pecharapa, 2017). Additionally, in the spectra of ethylene glycol (Figures 2–4, c)) some specific peaks and bands can be observed. The strong and broad band at 3355 cm^{-1} is a result of the stretching vibrations of the O–H groups, while two strong bands at 2945 cm^{-1} and 2880 cm^{-1} are related to the antisymmetric and symmetric stretching of C–H groups, respectively (Lin, Ren, Tian, Zhou, & Sun, 2013; Çabuk, Yılmaz, & Yıldız, 2019). A peak at 1460 cm^{-1} corresponds to CH_2 bending, while the peak at 1400 cm^{-1} is associated with the bending of C–O–H (Haoue, Derdar, Belbachir, & Harrane, 2020). A weak band at 1205 cm^{-1} is associated with CH_2 wagging, while two very strong and sharp bands at 1085 cm^{-1} and 1042 cm^{-1} are attributed to C–O stretching vibration. Furthermore, a strong band at 882 cm^{-1} is related to CH_2 rocking, while weak band at 522 cm^{-1} results from C–C–O bending vibrations (Kononova, Rodnikova, Solonina, & Sirotkin, 2018; Çabuk, Yılmaz, & Yıldız, 2019).

Figure 2 shows spectra of PET packaging material of green appearance, pure zinc acetate, pure ethylene glycol, and formulation PET-1.

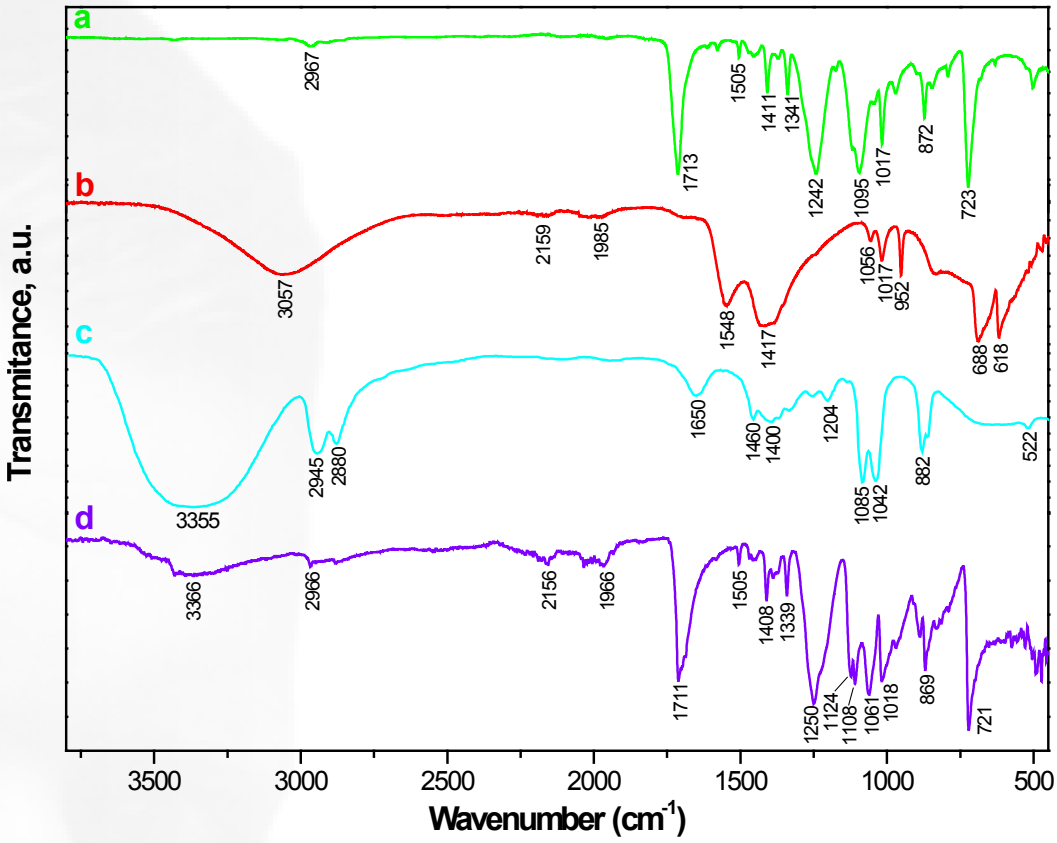


Figure 2. *ATR-FTIR Spectra of: a) PET Packaging Material of Green Appearance, b) Pure Zinc Acetate, c) Pure Ethylene Glycol, and D) Formulation PET-1*

In the spectrum of formulation PET-1 (Figure 2, d)), a broad and weak band appears at 3366 cm^{-1}, which was not observed in the spectrum of initial PET packaging material (Figure 2, a)). This band could be attributed to the presence of ethylene glycol and its hydroxyl groups. Additionally, two weak bands appear at 2156 cm^{-1} and 1966 cm^{-1} in spectrum of PET-1, which can be attributed to stretching vibrations of methyl groups from zinc acetate. Furthermore, two very weak peaks at 1124 cm^{-1} and 1108 cm^{-1} are present in the spectrum of PET-1 but are absent in spectrum of initial PET packaging material. These peaks could be associated with increased number of C–O stretching vibrations due to the presence of ethylene glycol.

Figure 3 shows the spectra of PET packaging material with white appearance, pure zinc acetate, pure ethylene glycol, and formulation PET-2, while Figure 4 shows the spectra of PET packaging material with blue appearance, pure zinc acetate, pure ethylene glycol, and formulation PET-3.

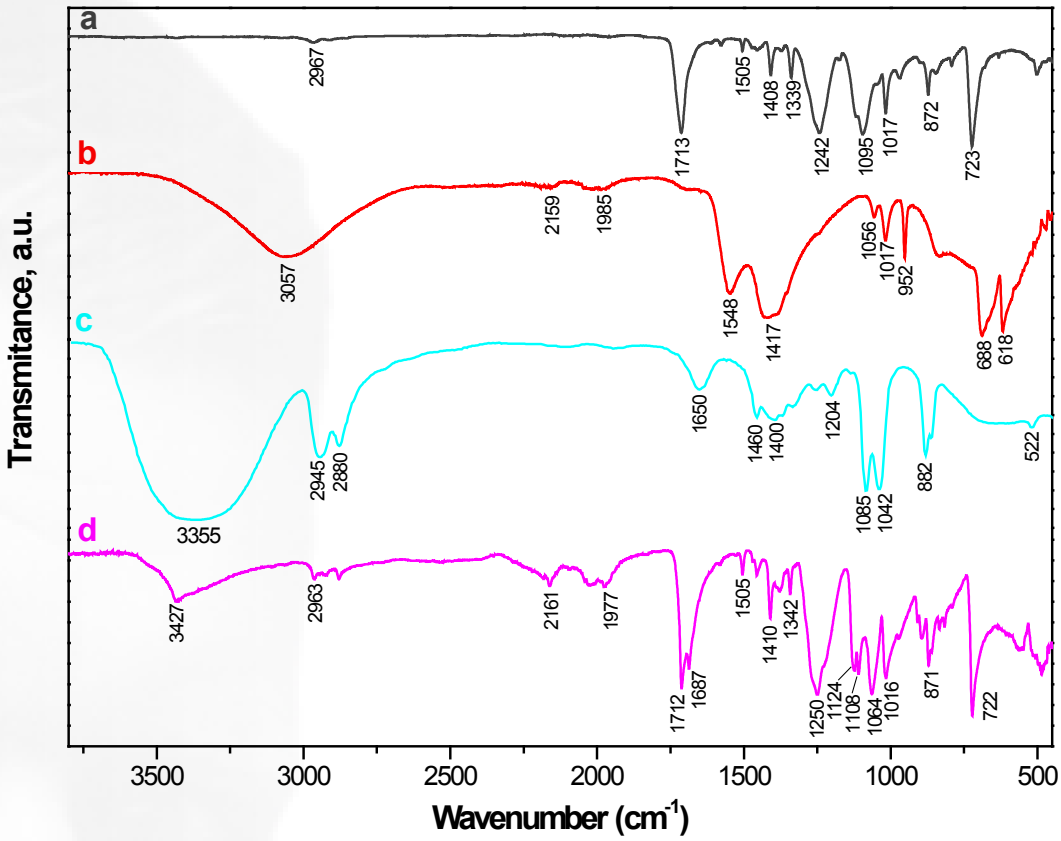


Figure 3. *ATR-FTIR Spectra of: A) Pet Packaging Material with White Appearance, B) Pure Zinc Acetate, C) Pure Ethylene Glycol, and D) Formulation PET-2*

In the spectra of formulations PET-2 (Figure 3, d)) and PET-3 (Figure 4, d)), similar patterns were observed to those in the spectrum of formulation PET-1 (Figure 2, d), including shifts and changes in the intensity of bands at 3427 cm^{-1}, 2161 cm^{-1}, 1977 cm^{-1}, 1124 cm^{-1}, and 1108 cm^{-1}. These similarities suggest that ethylene glycol and zinc acetate did not become covalently incorporated into polymer structure. Instead, it is more likely that they established electrostatic interaction with the polymer. Another possibility is that the clumps obtained after glycolysis reaction were not sufficiently rinsed, leading to residual contamination in the powders. Additionally, some unspecified bands in the spectra of all PET packaging materials and their corresponding PET-based powders (Figures 2–4, a) and d)), such as those around 1505 cm^{-1}, 1410 cm^{-1}, and 1340 cm^{-1}, could be attributed to additives present in the original polymer. These bands may reflect the presence of residual additives or impurities that were not fully removed during the glycolysis and purification processes.

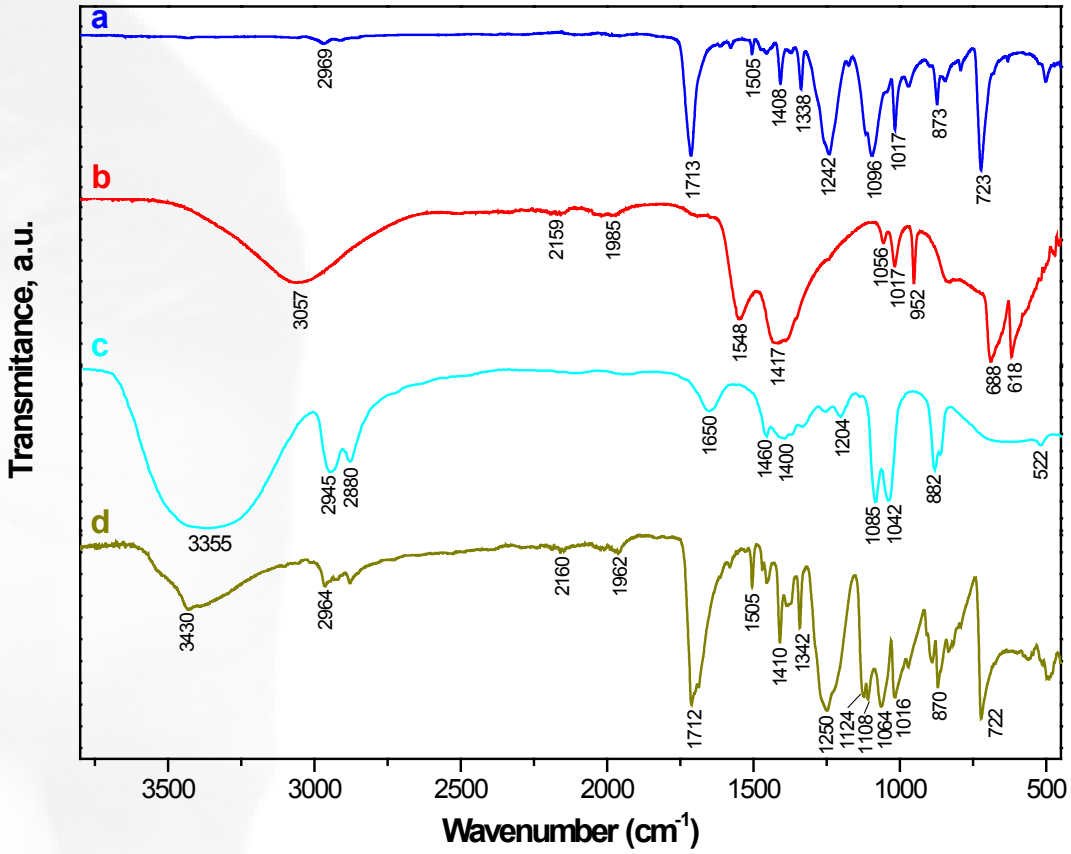


Figure 4. *ATR-FTIR Spectra of: A) Pet Packaging Material with Blue Appearance, B) Pure Zinc Acetate, C) Pure Ethylene Glycol, and D) Formulation PET-3*

OPTICAL MICROSCOPY

The Appearance of PET-Based Powders

Optical microscopy was used to estimate the size and uniformity of the prepared powder formulations. Figure 5 shows images of these powders, recorded with the *Leica FS C Comparison Macroscope*, equipped with the *Leica IM Matrox Meteor II Driver Software Module*. Images were taken at ×10 magnification using both dark-field (Figure 5, *I*) and bright-field (Figure 5, *II*) contrast techniques. Different backlighting modes were employed to enhance contrast, with the aim to observe and compare both amassed and thin layers of powders. Therefore, powder samples were spread over microscopic glass slides to approximate the size and compare the uniformity of their particles. Figure 5, *III*, represents the structure and appearance of the prepared powders as photographed under visible light with a magnifying glass (magnification ×5) using a 50 MP camera (aperture *f*/1.8, pixel size 0.64 μm).

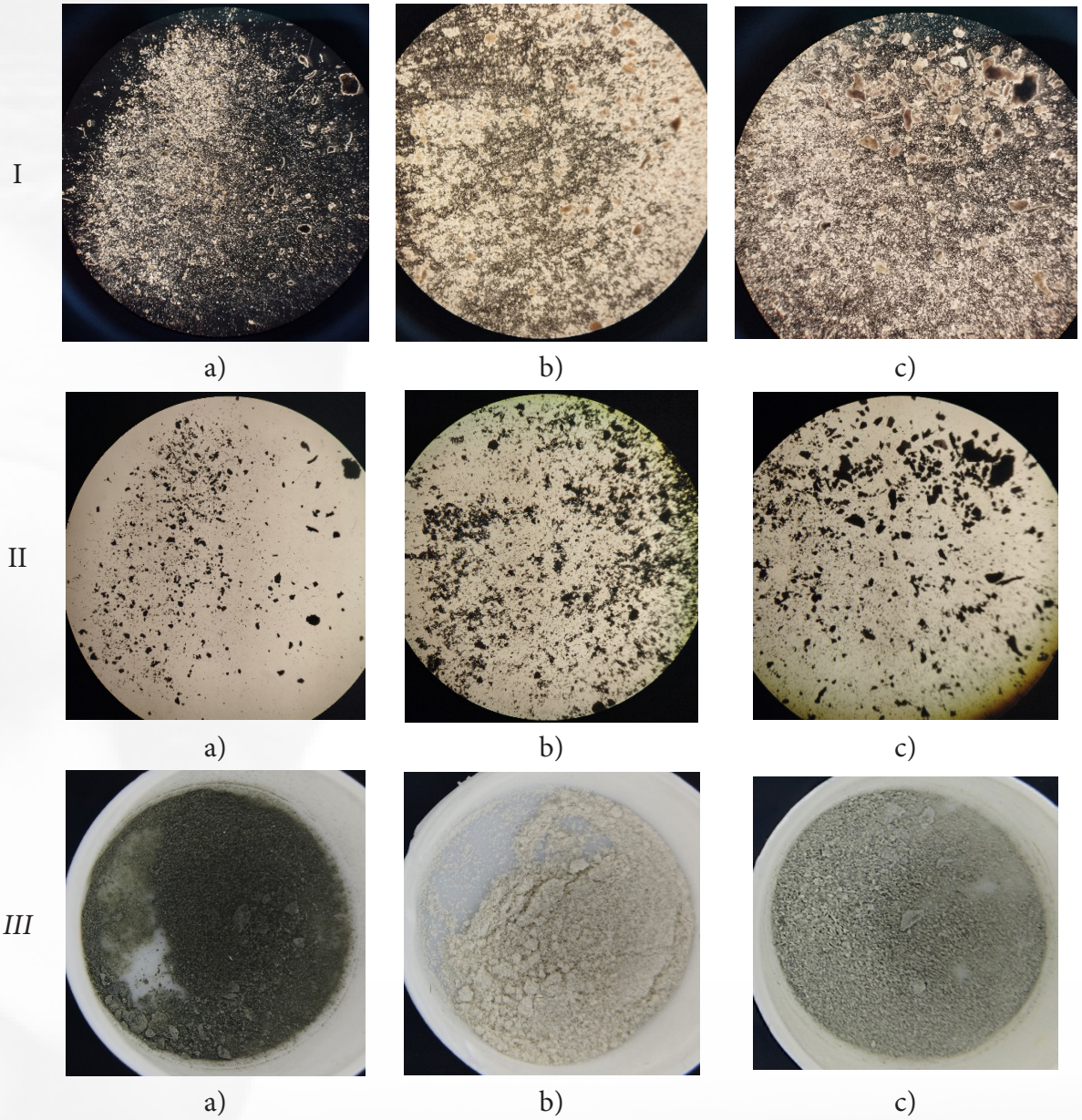


Figure 5. *Microscopic Images of Prepared Powders: a) PET-1, b) PET-2 and c) PET-3, Recorded with: I – Dark-Field Contrast Technique, and Ii – Bright-Field Contrast Technique, Using Optical Microscope with Magnification × 10; Iii – a Magnifying Glass (Magnification × 5) Under Visible Light, Using a 50 Mp Camera (Aperture ƒ/1.8, Pixel Size 0.64 μm)*

When comparing the prepared powders recorded under different backlighting modes, it is evident that all powders have small, round-shaped particles, but with noticeable deviation in particle size, likely due to imperfections of grinding or dusting process. As shown in Figure 5, b, formulation PET-2 had the most uniform particles evenly distributed over the glass substrate. In contrast, PET-1 and PET-3 had smaller particles that noticeably adhered to the glass surface (Figure 5, a and c)). Such properties of the powders' particles could potentially cause smudging or blurring of developed fingerprints, due to a larger dimeter of particles and increased adhesion to the substrate (Gürbüz, Özmen Monkul, İp-eksaç, Gürtekin Seden, & Erol, 2015). On the other hand, as shown in Figure 5, *III*, prepared powder formulations retained the appearance of waste raw materials used for their preparation, i.e. PET-1 with green, PET-2 with white, and PET-3 with blue appearance. This indicates that chemical structure of the original PET material was preserved throughout the process.

Testing of PET-Based Powders and Comparison with Commercial Powder

The prepared powder formulations were used to develop latent fingerprints on glass substrates to validate the results of the initial examination. Following the Guidelines proposed by the International Fingerprint Research Group (Almog, Cantu, Champod, Kent, & Lennard, 2014), one female and two male donors, using only a right-hand index finger, deposited sebaceous fingerprints onto microscopic glass slides using a technical scale (force applied to accommodate 100–150 g). The prints were then stored under laboratory (humid) conditions and developed at different time intervals: immediately after deposition (day 0), after 1 day, 7 days and 30 days. After the specified intervals, fingerprints were divided into two halves using a thin glass barrier, and then two different powders were used for their visualization – prepared PET-based powder formulations were applied with BVDA Squirrel hair brush to the left-half, and BVDA Magnetic Silver powder was applied with BVDA Magnetic brush to the right-half barrier side. The developed fingerprints were then recorded using an optical microscope *Leica FS C Comparison Macroscope*, equipped with the *Leica IM Matrox Meteor II Driver Software Module*, with dark-field (Figure 6, *I*) and bright-field contrast technique (Figure 6, *II*), at ×10 magnification. Different backlighting modes were used to achieve appropriate contrast and observe both level I and II fingerprint features. For practical reasons, only the fingerprints developed immediately (day 0) from one female donor are shown in the Manuscript, while detailed results are available in the Supplementary Material.

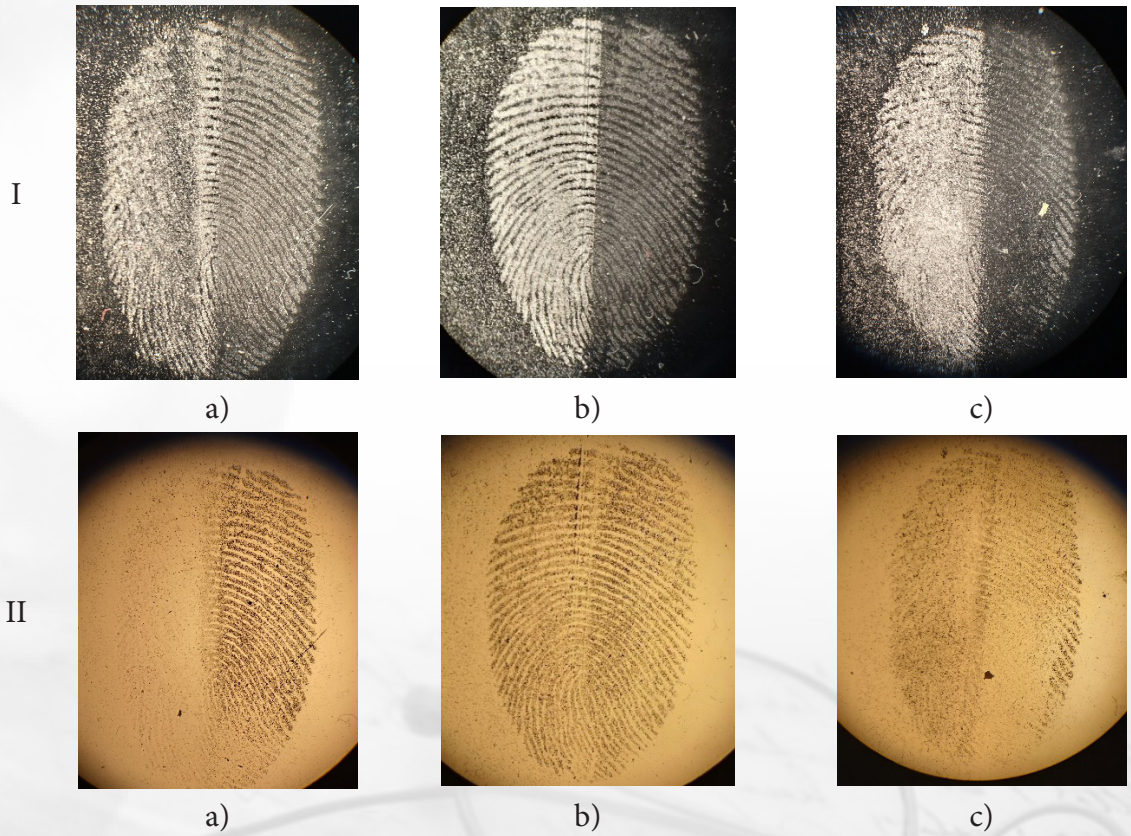


Figure 6. *Sebaceous Fingerprints Deposited onto Glass Substrate, Left for a Few Minutes, and Developed with: a) PET-1, b) PET-2, and c) PET-3 on the Left-Half Side of the Images, and a)–c) BVDA Magnetic Silver Powder on the Right-Half Side of the Images. Fingerprints Were Recorded with Optical Microscope (Magnification × 10), Using: I – Dark-Field Contrast Technique, and Ii – Bright-Field Contrast Technique*

The results obtained using optical microscopy confirmed the initial observations on glass substrate (Figure 1), and highlighted the superior performance of formulation PET-2 in visualizing latent fingerprints (Figure 6, b), left-half side of the fingerprint images). It was determined that formulation PET-2 enabled the clear development of basic fingerprint patterns and papillary lines, including minutiae points as well (i.e. level I and II features of fingerprints). Such results were noticeable when comparing PET-2 with formulations PET-1 and PET-3, and especially with commercial powder. Both, PET-2 and BVDA Magnetic Silver powder developed high-quality and complete fingerprint images, with all level I and II features. On the other hand, formulations PET-1 and PET-3 resulted in "over-powdering" of the interpapillary space and blurring of the fingerprints (Figure 6, a) and c), left-half side of the fingerprint images), which disrupted the flow of papillary lines. The issue is likely due to the larger particle size and their non-uniform distribution (Gürbüz, Özmen Monkul, İpeksaç, Gürtekin Seden, & Erol, 2015; Vučković, Glođović, Radovanović, Janaćković, & Milašinović, 2020).

Further analysis, Figures S2–S5 presented in Supplementary Material, assessed the impact of moisture on fingerprint residues and the quality of visualization over time. The results indicated that moisture and the flat glass surface probably altered the structure and quantity of fingerprint residues (Barnett & Berger, 1976; Jones, Downham, & Sears, 2010), leading to a decrease in fingerprint quality as storage time increase. Additionally, variations in developed fingerprint quality among donors were also observed, likely to uneven pressure applied to the glass surface. This resulted in different quantity of sweat and lipid residues, even though donors deposited traces in accordance with the guidelines. Therefore, the performance of the PET-based powders should be enhanced through modifications of the depolymerization process or the addition of specific additives (e.g. fluorescent compounds), which could improve their effectiveness and expand their applicability across different substrates and under various conditions (thoroughly presented in Supplementary Material).

ORIGINALITY/VALUE

In this paper, PET-based powders were prepared by depolymerizing PET packaging material (bottles) through a glycolysis reaction, using ethylene glycol as a solvent and zinc acetate as a catalyst. The prepared powders were used to develop latent fingerprints on glass substrates, and their efficiency was compared with the commercially available BVDA Magnetic Silver powder. This approach presents a potential solution for managing PET waste, a significant environmental pollutant. ATR-FTIR analyses confirmed the structure of prepared PET-based powders, and identified the presence of additives and components from the glycolysis reaction. The results of initial examination of prepared powder formulations demonstrated satisfying visualization of sebaceous fingerprints deposited onto the glass surface, for all prepared powders. These results were further investigated by optical microscopy, suggesting that formulation PET-2 contained the most uniform particles, which provided the best results in developing latent fingerprints. Additionally, formulation PET-2 demonstrated performances comparable to the commercial BVDA Magnetic Silver powder.

However, results obtained from fingerprints stored over various time indicated that humid environment (moisture), along with a flat glass surface, contributed to changes in the structure and reduction of fingerprint residues (Barnett & Berger, 1976; Jones, Downham, & Sears, 2010). This effect led to a decrease in print quality over time. Variations in developed fingerprints quality among donors were also observed. Such result may be attributed to uneven pressure applied on the glass surface, resulting in more or less sweat and lipid residues, despite adherence to guidelines. Besides substrate properties (type, colour, structure, etc.), environmental conditions and touch pressure, the quality of fingerprints is also affected by sex, age, ethnicity, metabolism of the donors and their daily routine (nutrition,

smoking, medication, cosmetics, etc.) (Archer, Charles, Elliott, & Jickells, 2005; Trapecar & Balazic, 2007; Croxton, Baron, Butler, Kent, & Sears, 2010; Hazarika & Russell, 2012; Cadd, Islam, Manson, & Bleay, 2015). Nevertheless, the consistent method of depositing and visualizing latent fingerprints ensured that the results were valid and reliable. On the other hand, formulation PET-2 showed better performances than formulations PET-1 and PET-3, by maintaining continuous papillary line flow and developing complete fingerprint images, with level I and II features, without retaining in the interpapillary space.

The prepared PET-based powders are cost-effective, easy to apply, and durable during testing, offering a sustainable solution through recycling PET packaging material. By integrating circular economy principles, this approach significantly contributes to environmental protection by revalorizing PET waste, thereby reducing landfill accumulation and resource depletion. Based on all presented results, PET-based powders could complement existing fingerprinting methods used on non-porous substrates in forensic practice. Further research should focus on expanding the application of these powders to unconventional surfaces (e.g., multi-coloured substrates, firearms, skin, etc.), to enhance selectivity, sensitivity and overall quality of developed fingerprints.

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SUPPLEMENTARY MATERIAL

Examination of the functionality and performances of prepared PET-based powders in visualizing latent fingerprints was conducted by following the guidelines proposed by the International Fingerprint Research Group. Experimental procedures were set to carry out Phase 1 (*Pilot Studies*) of recommended guidelines, which briefly includes:

- 3–5 donors;
- 1–3 clean, low interference substrates;
- Donors briefed on how to deposit fingerprints, with assistance provided as required;
- Natural prints preferred, with groomed prints avoided where possible;
- Fingerprints should normally be allowed to "age" for a minimum of 24 hours prior to development and the actual age prior to treatment should be recorded and reported;
- The study should include at least a preliminary performance comparison against relevant routine detection methods (for example, the treatment of split prints can be used to provide an initial indication of relative performance);
- Qualitative or holistic scales should be employed for assessing the quality of fingerprint development; and

Reports must clearly indicate limitations and conclusions must be conservative (Almog, Cantu, Champod, Kent, & Lennard, 2014).

Therefore, one female and two male donors, using only a right-hand index finger, deposited their sebaceous fingerprints onto non-porous (glass) surface using technical scale (force accommodated to 100–150 g, per fingerprint), in order to simulate manipulation with objects under real conditions, and fingerprints were left under humid (laboratory) conditions for specified time intervals – a few minutes (day 0; immediate development of latent fingerprints), 1 day, 7 days and 30 days. After the mentioned periods, three prepared powder formulations, as well as BVDA Magnetic silver powder (control powder) were used to evaluate performances in developing latent fingerprints. Afterwards, all fingerprints were recorded with *Leica FS C Comparison Macroscope*, equipped with the *Leica IM1000 Matrox Meteor II Driver Software Module*, using magnification ×10 and two contrast techniques (backlighting).

Initial testing of obtained powders was performed prior to thorough investigation by optical microscopy, with the aim of evaluating the properties of the prepared powders. The results of initial examination are shown in Figure S1, which represent sebaceous fingerprints of one male donor, developed immediately after deposition on the glass surface, using the prepared powder formulations, PET-1 (Figure S1, a)), PET-2 (Figure S1, b)), and PET-3 (Figure S1, c)). The prints were then photographed with a magnifying glass (×5) under visible light, using a 50 MP camera (aperture $f/1.8$, pixel size 0.64 μm). The fingerprints were photographed with assistance of black background surface for adequate contrast.

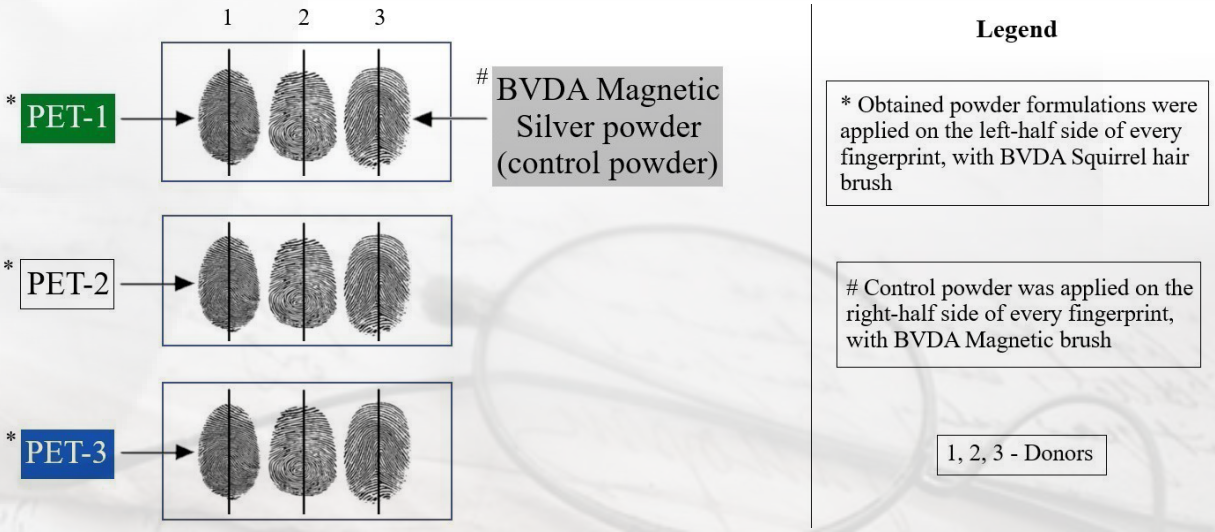


a) b) c)

Figure S1. *Sebaceous Fingerprints of One Male Donor Developed on Glass Surface, Using Prepared Formulations: a) PET-1, b) PET-2, and c) PET-3, Recorded with a Magnifying Glass (×5) Under Visible Light. The Fingerprints Were Recorded with Assistance of Black Background Surface.*

Based on results in Figure S1, it is evident that the sebaceous fingerprints were successfully developed on the glass surface with all applied powder formulations. The results showed that all obtained formulations demonstrated satisfying development of latent fingerprints, by visualizing complete fingerprint images. The powders developed the prints with continuous papillary line flow, probably due to small particles, enabling good contrast and visualization of fingerprint level 1 and 2 features. On the other hand, slight retention of particles in the interpapillary space caused "overpowdering" of the fingerprints, probably due to non-uniform distribution of powders' particles, but without significant impact on fingerprint quality and features.

Subsequently, in different time intervals, the fingerprints deposited onto the glass surface were separated into halves with a thin glass barrier, and specified powders were applied, as represented in the scheme bellow:



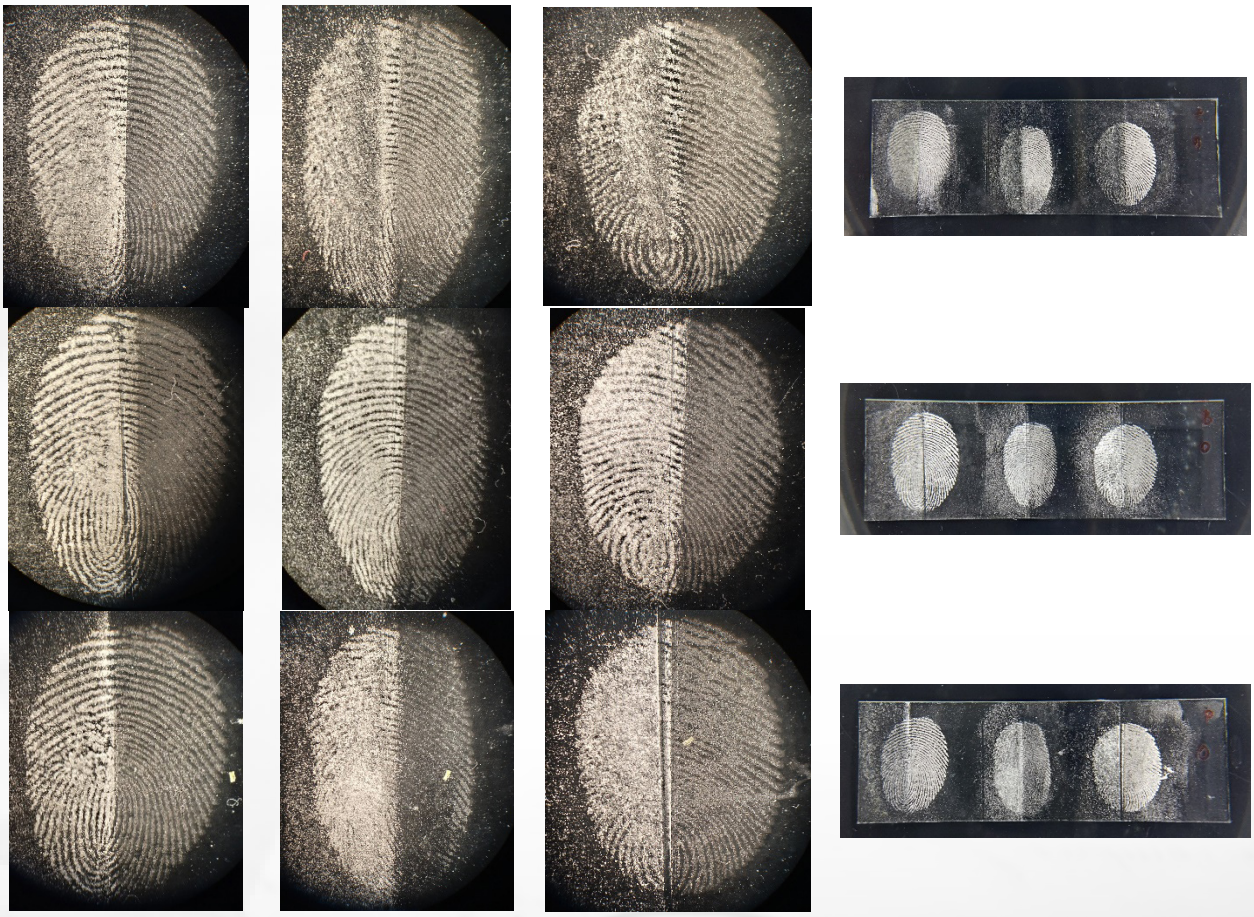
Afterwards, the fingerprints developed after different time intervals, were recorded with the mentioned optical microscope, using magnification ×10, and dark-field and bright-field contrast techniques.

Immediate Development of Latent Fingerprints – April 15, 2024

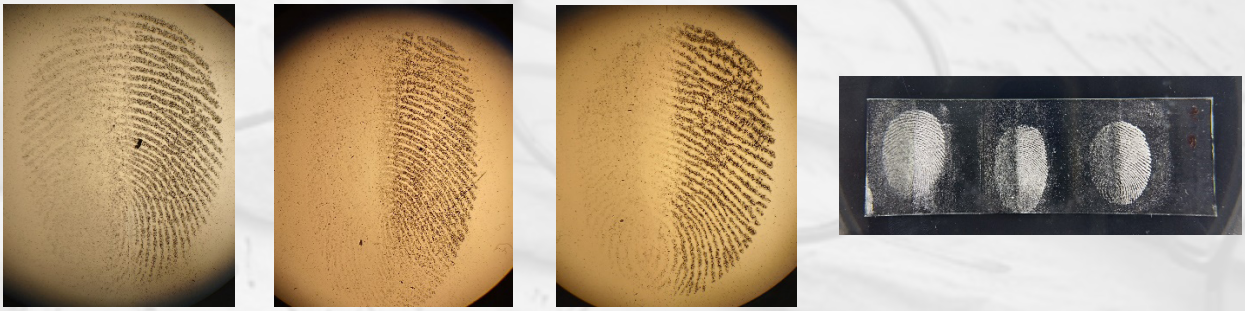
The sebaceous fingerprints of one female and two male donors were developed immediately after deposition (day 0), with formulations PET-1, PET-2, PET-3 and BVDA Magnetic silver powder (control powder). Figure S2 represents fingerprints developed on the glass surface, recorded using dark-field (Figure S2, *I*) and bright-field (Figure S2, *II*) contrast techniques. In the far-right column, all developed fingerprints photographed with a magnifying glass (magnification ×5) using a 50 MP camera (aperture *f*/1.8, pixel size 0.64 μm) were shown.

The fingerprints were developed on the glass surface and recorded with the optical microscope, using:

I – Dark-field contrast technique



II – Bright-field contrast technique



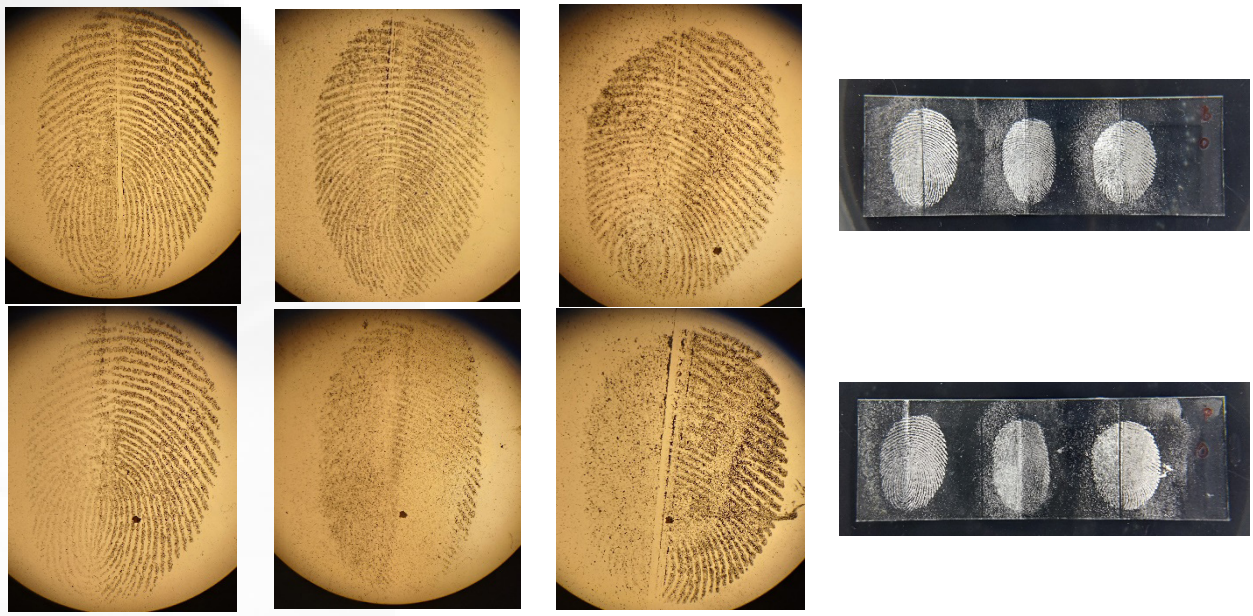


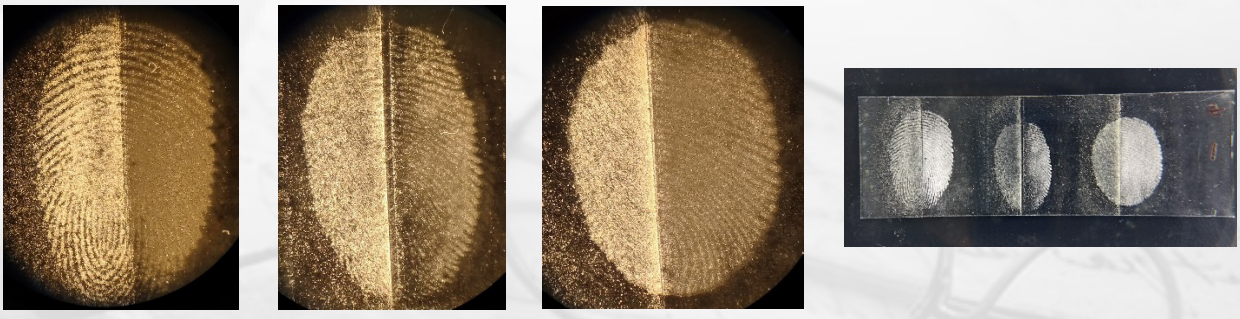
Figure S2. *The Sebaceous Fingerprints Developed Immediately After Deposition (Day 0) on the Glass Surface with the Aforementioned Powders, Recorded Using: I – Dark-Field, and II – Bright-Field Contrast Techniques. In the Far-Right Column Are Shown All Developed Fingerprints Photographed Under Visible Light with a Magnifying Glass (Magnification ×5).*

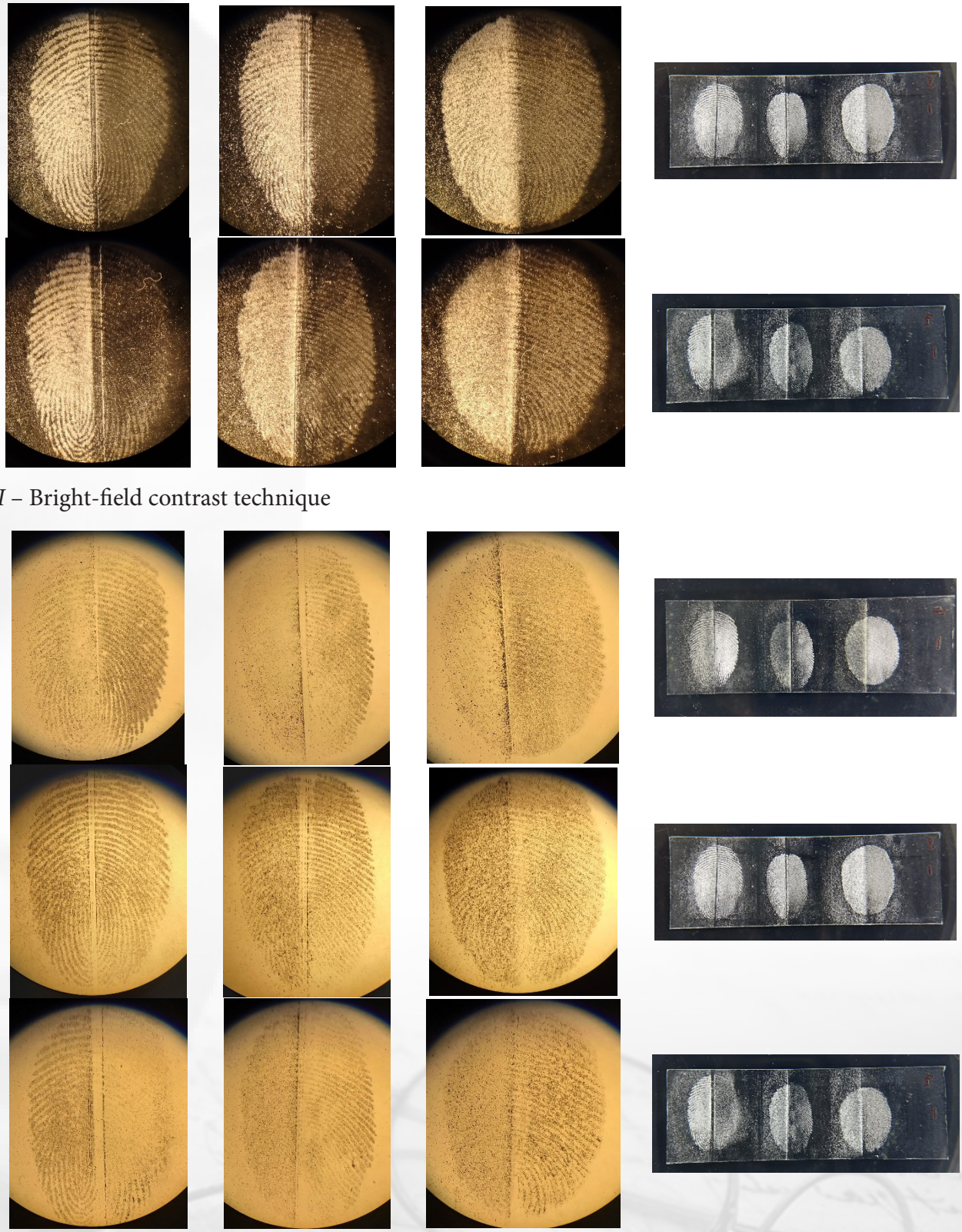
Development of Latent Fingerprints 1 Day After Deposition – April 16, 2024

The sebaceous fingerprints of one female and two male donors were developed 1 day after deposition, with formulations PET-1, PET-2, PET-3 and BVDA Magnetic silver powder (control powder). Figure S3 represents the fingerprints developed on the glass surface, recorded using dark-field (Figure S3, *I*) and bright-field (Figure S3, *II*) contrast techniques. In the far-right column, all developed fingerprints photographed with a magnifying glass (magnification ×5) using a 50 MP camera (aperture *ƒ*/1.8, pixel size 0.64 μm) were shown.

The fingerprints were developed on the glass surface and recorded with the optical microscope, using:

I – Dark-field contrast technique





II – Bright-field contrast technique

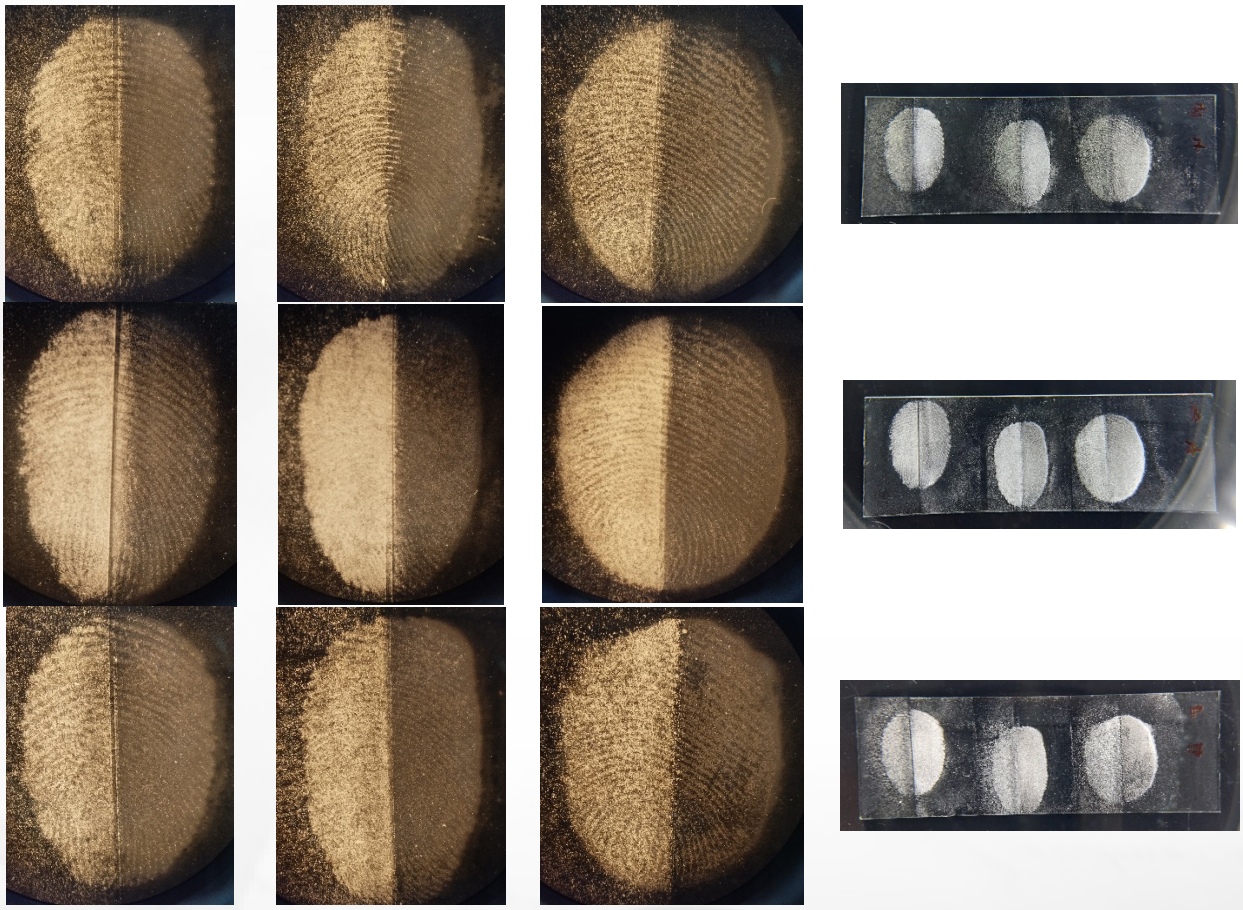
Figure S3. *The Sebaceous Fingerprints Developed 1 Day After Deposition on the Glass Surface with the Aforementioned Powders, Recorded Using: I – Dark-Field, and II – Bright-Field Contrast Techniques. In the Far-Right Column Are Shown All Developed Fingerprints Photographed Under Visible Light with a Magnifying Glass (Magnification ×5).*

Development of Latent Fingerprints 7 Days After Deposition – April 22, 2024

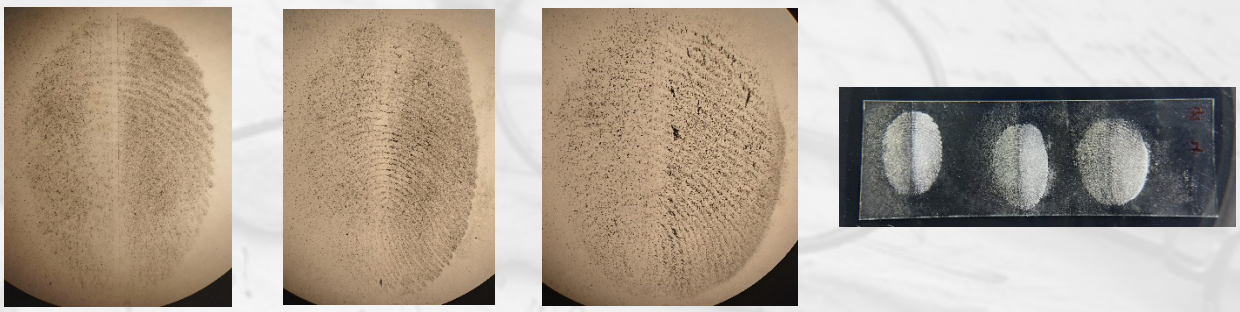
The sebaceous fingerprints of one female and two male donors were developed 7 days after deposition, with formulations PET-1, PET-2, PET-3 and BVDA Magnetic silver powder (control powder). Figure S4 represents the fingerprints developed on the glass surface, recorded using dark-field (Figure S4, *I*) and bright-field (Figure S4, *II*) contrast techniques. In the far-right column, all developed fingerprints photographed with a magnifying glass (magnification ×5) using a 50 MP camera (aperture *ƒ*/1.8, pixel size 0.64 μm) were shown.

The fingerprints were developed on the glass surface and recorded with the optical microscope, using:

I – Dark-field contrast technique



II – Bright-field contrast technique



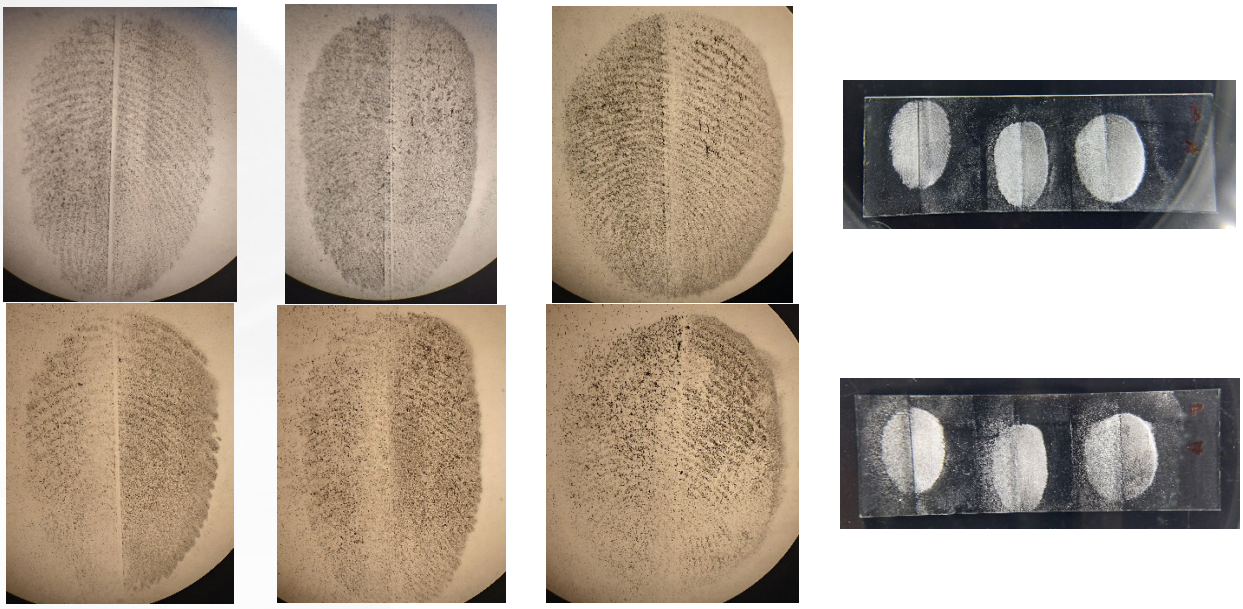


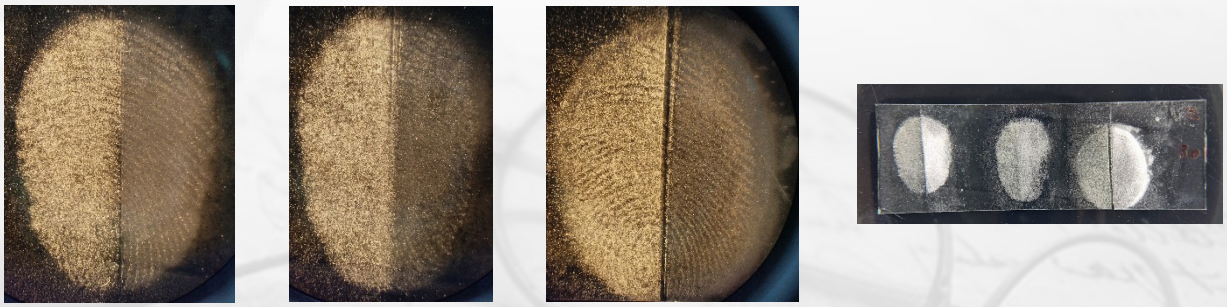
Figure S4. *The Sebaceous Fingerprints Developed 7 Days After Deposition on the Glass Surface with the Aforementioned Powders, Recorded Using: I – Dark-Field, and II – Bright-Field Contrast Techniques. In the Far-Right Column Are Shown All Developed Fingerprints Photographed Under Visible Light with a Magnifying Glass (Magnification ×5).*

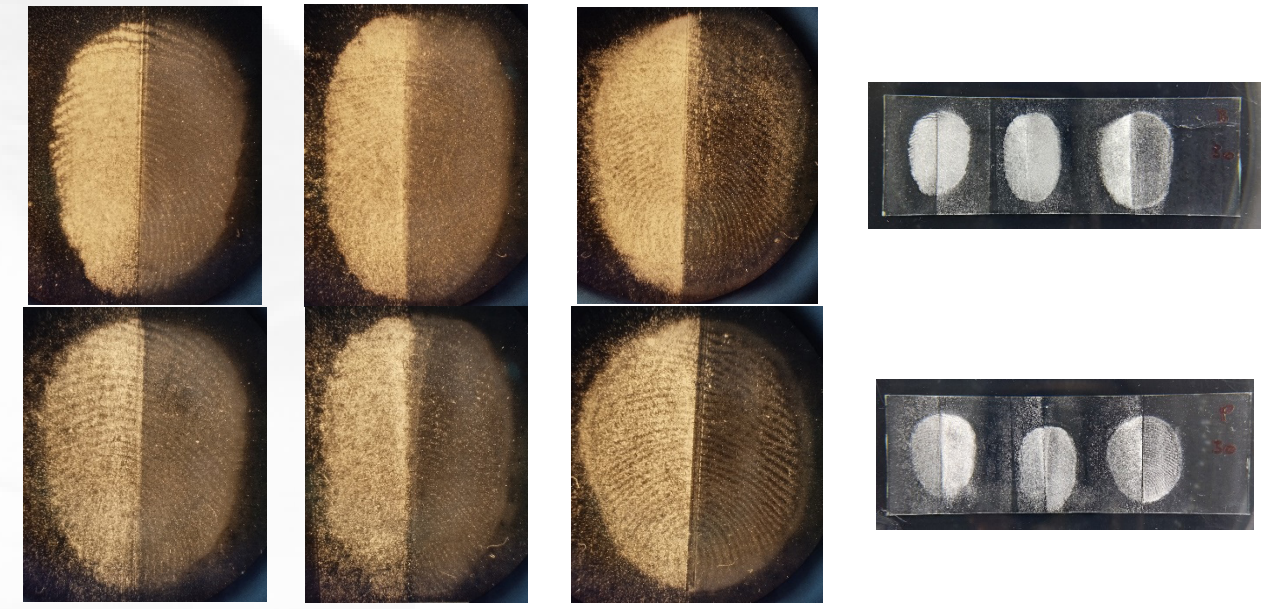
Development of Latent Fingerprints 30 Days After Deposition – May 15, 2024

The sebaceous fingerprints of one female and two male donors were developed 30 days after deposition, with formulations PET-1, PET-2, PET-3 and BVDA Magnetic silver powder (control powder). Figure S5 represents the fingerprints developed on the glass surface, recorded using dark-field (Figure S5, *I*) and bright-field (Figure S5, *II*) contrast techniques. In the far-right column, all developed fingerprints photographed with a magnifying glass (magnification ×5) using a 50 MP camera (aperture $f/1.8$, pixel size 0.64 μm) were shown.

The fingerprints were developed on the glass surface and recorded with the optical microscope, using:

I – Dark-field contrast technique





II – Bright-field contrast technique

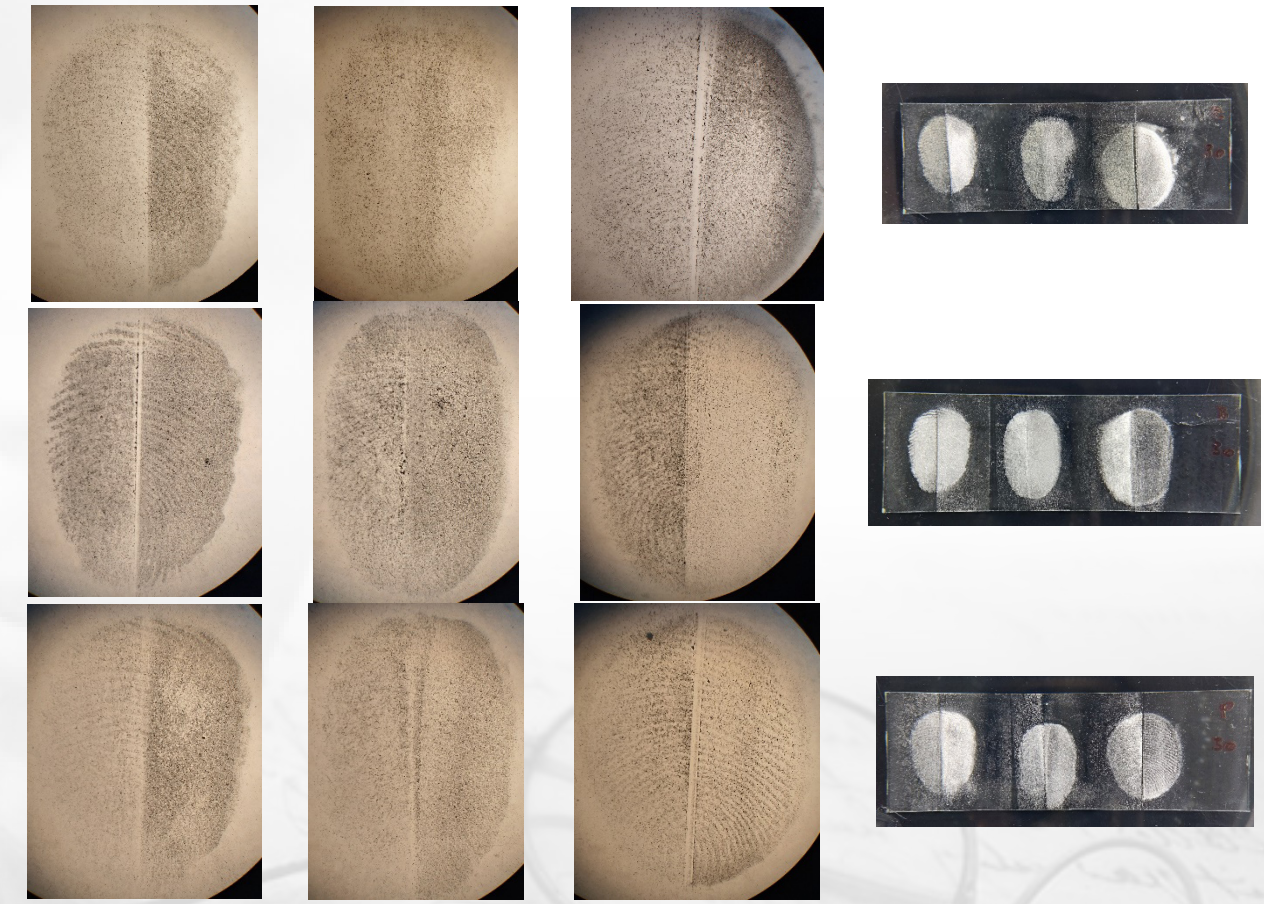


Figure S5. *The Sebaceous Fingerprints Developed 30 Days After Deposition on the Glass Surface with the Aforementioned Powders, Recorded Using: I – Dark-Field, and II – Bright-Field Contrast Techniques. In the Far-Right Column Are Shown All Developed Fingerprints Photographed Under Visible Light with a Magnifying Glass (Magnification ×5).*

CONCLUSIONS

The results of initial examination showed that all obtained formulations demonstrated satisfying development of latent fingerprints, by visualizing complete fingerprint images. However, when comparing visualization of the latent fingerprints kept in different time intervals, it is evident that the quality of prints kept for a shorter period of time (Figures S2 and S3) was far better than those stored for longer periods (Figures S4 and S5). Humid environment and a flat glass surface probably contributed to the change in the structure and reduction of sweat and lipid fingerprint residues, respectively (Barnett & Berger, 1976; Jones, Downham, & Sears, Effect of substrate surface topography on forensic development of latent fingerprints with iron oxide powder suspension, 2010). Therefore, the powders' particles had a smaller quantity of residues available for interaction (demonstrating unselective binding to prints), with increased sticking to the substrate due to adhesion. Variations in quality of visualized fingerprints between donors could also be observed. Such results may be related to uneven pressure on the glass surface, resulting in more or less sweat and lipid residues, even though donors deposited traces in accordance with the guidelines. Besides substrate properties (type, colour, structure, etc.), environmental conditions and touch pressure, the fingerprint quality is also affected by sex, age, ethnicity, metabolism of the donors and their daily routine (nutrition, smoking, medication, cosmetics, etc.) (Archer N. E., Charles, Elliott, & Jickells, 2005; Trapecar & Balazic, 2007; Croxton R. S., Baron, Butler, Kent, & Sears, 2010; Hazarika & Russell, 2012; Cadd S. , Islam, Manson, & Bleay, 2015). Nevertheless, the consistent method of depositing and visualizing the latent fingerprints ensured that the results were valid and reliable.

Additionally, when comparing the prepared powder formulations, the best results were obtained with PET-2, due to selective binding and visualization of papillary lines with their continuous flow, without retaining in the interpapillary space. Formulations PET-2 successfully developed level 1 and 2 features, which could be related to small particles of powder, more uniform in size, when compared to PET-1 and PET-3 (confirmed by optical microscopy). Smaller particles better adhere and bind to sweat and lipid fingerprint residues (Gürbüz, Özmen Monkul, İpeksaç, Gürtekin Seden, & Erol, 2015), and these results are particularly visible in Figures S2 and S3. Moreover, when compared to BVDA Magnetic Silver powder, formulation PET-2 showed comparable and equally good results of visualization. It is important to emphasize that commercial powder also developed lower-quality fingerprints previously kept for 7 days and 30 days when compared to prints kept for a few minutes and 1 day, as well as prepared formulations. Therefore, the presented results showed very satisfying visualization of the sebaceous fingerprints on the glass surface, with cheap PET-based powders obtained through recycling of waste raw material.

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PREDICTION OF DETONATION PERFORMANCE AND STABILITY OF NEW CLASS HIGH ENERGETIC MATERIALS

Gvozden Tasić, PhD
Marija Ječmenica Dučić, PhD
Jelena Radovanović[1]
University of Belgrade, VINČA Institute of Nuclear Sciences – National Institute of the Republic of Serbia, Department of Physical Chemistry, Belgrade, Serbia

Dušan Veljković, PhD
University of Belgrade, Faculty of Chemistry, Belgrade, Serbia

Đurica Katnić
University of Belgrade, VINČA Institute of Nuclear Sciences – National Institute of the Republic of Serbia, Department of Physical Chemistry, Belgrade, Serbia

PURPOSE

The term 'energetic material' is used to describe any material that can react with the rapid release of high amounts of energy in form of heat upon initiation (Klapötke, 2022). This broad category includes common fuels like gasoline and diesel, as well as rocket propellants, pyrotechnics, and high-energy explosives such as gunpowder, dynamite, and TNT (Trinitrotoluene) (Bruce Cranford & AIChE, 2008). The variety and quantity of high-energy materials have expanded significantly over recent decades. In explosive research and development, high performance has always been a crucial criterion. However, the occurrence of catastrophic detonations has prompted the development of explosives with better thermal stability and reduced sensitivity to impact (Sikder & Sikder, 2004; Mathieu, 2017). The origin of these threats can be different, starting with accidents during the transport of dangerous goods, then accidents that occur during the work processes in industry, or laboratories, as well as accidents that happen as a result of weather disasters such as earthquakes and typhoons (Tasić et al., 2021). Typically, less sensitive explosives tend to have lower performance. Currently, there is a strong interest in designing new energetic materials that combine high performance with good stability, surpassing those in current use (Mathieu, 2017). Research using computer programs to explore the relationship between the structure and properties of explosives has led to the design new energetic materials with enhanced performance and reduced sensitivity. Reliable computational methods help scientists safely manage energetic molecules and offer valuable insights into the factors that affect the sensitivity of these compounds (Türker & Variş, 2009). The sensitivity of explosives can be influenced by the positive electrostatic potential at the center of the molecule. Nitroaromatic compounds, like TNT, are well-known explosives that exhibit positive potentials around their central regions because the nitro group attracts electrons. Additionally, C-NO_2 bonds in these compounds are relatively weak and can break easily under external influences, which can lead to detonation (Politzer & Murray, 2014a; Shoaf & Bayse, 2018). Several quantitative measures are used as indicators of detonation performance, including detonation

1 jelena.radovanovic@vinca.rs

velocity (D), detonation pressure (P), brisance (B), and Gurney velocity. Detonation velocity (D) is the stable speed of the shock front, while detonation pressure (P) is the stable pressure behind the front. Brisance refers to the explosive power, primarily indicated by detonation pressure, and Gurney velocity is the speed of metal fragments. Among these, detonation velocity and detonation pressure are crucial for evaluating explosives, with higher values being preferable (Keshavarz et al., 2009; Politzer & Murray, 2017).

Electrostatic potentials on the surfaces of C, H, N, and O atoms in explosives differ significantly from those in typical organic molecules. Energetic compounds often contain atoms or groups like -aza, -nitro, or -nitrito that attract electrons towards the molecule's periphery, creating positive electrostatic potentials in the central regions of the molecule. In contrast, typical organic molecules (excluding hydrocarbons) usually have negative potentials on their surfaces due to lone electron pairs or π-electrons (Politzer & Murray, 2021).

Positive electrostatic potentials in the central regions of high-energy molecules are associated with increased sensitivity to impact, especially within the same class of chemical compounds. For instance, in a specific class of compounds like nitroaromatics, higher positive potentials in the central part of the molecule correlate with greater sensitivity to impact (Politzer & Murray, 2003, 2015a, 2015b).

One hypothesis suggests that very positive electrostatic potentials in the central regions of molecules and at the C-NO_2 and N-NO_2 bond regions of neighboring molecules cause repulsion. This repulsion increases resistance to shearing or sliding, contributing to the formation of "hot spots" and influencing the initiation of detonation, thereby making the explosive more sensitive (Politzer et al., 2017).

On the other hand, it is known that so-called 'trigger linkages,' such as C-NO2 and N-NO2 bonds, influence the positive electrostatic potential, which is crucial for initiating detonation. Even with just one C-NO_2 bond present, positive maxima *Vs(r)* above these bonds can occur (Politzer & Murray, 1999, 2003). The withdrawal of negative charge from the interior of the molecule to the periphery creates a strong positive potential in the center of the molecule and above the C-NO_2 and N-NO_2 bonds. This results in a depletion of charge in the bonds, making them weaker. The stronger the positive potential above the bonds, the weaker the bonds become, and the greater the potential for detonation initiation (Politzer & Murray, 2003).

It has been proven that as the number of aromatic rings in a molecule increases, the electrostatic potential above the central parts of the molecule decreases. This reduction in electrostatic potential suggests that the molecule's sensitivity to detonation decreases (S. Veljković et al., 2021).

By introducing electron-donating or electron-accepting groups as substituents and varying the number of aromatic rings, the electrostatic potential in the central parts of the molecules is altered. This modification directly influences the sensitivity and detonation parameters of the compounds.

DESIGN/METHODS/APPROACH

All calculations for molecular systems were performed using the Gaussian 09 software package utilizing the B3LYP functional, most widely used DFT functional. It has been shown that DFT methods (Maslovara et al., 2019; Ječmenica Dučić et al., 2023), particularly B3LYP (Becke-3 Parameter-Lee-Yang-Parr) as a hybrid DFT method, provide reliable geometries while also requiring less time and computational resources. For geometry optimization, the Dunning correlation-consistent basis set cc-PVDZ was used.

Initially, molecules were drawn in ArgusLab (*ArgusLab*, n.d.) and optimise in Gaussian 09 (*G09 | Gaussian.Com*, n.d.). After completing the calculations, wave function files were obtained and used in the WFA-SAS (Wave Function Analysis - Surface Analysis Suite) program to create electrostatic potential maps (Plasser et al., 2022). The resulting maps were scaled to approximately the same scale and displayed the calculated critical points on the molecular surfaces.

The Kamlet-Jacobs equations, which have demonstrated good accuracy and reliability when compared with experimental values, are of particular importance for the design of explosive compounds (Politzer & Murray, 2011, 2014a).

The detonation pressure is defined by the equation:

$$P_{det} = \rho_0 DW + P_1 \quad (1)$$

where ρ_0 is the density of the explosive, D is the detonation velocity, W is the particle velocity, and P_1 is the initial pressure of the explosive, which is negligible compared to P_{det} .

Kamlet and Jacobs described simple methods for calculating detonation parameters for explosives that contain carbon, hydrogen, nitrogen, and oxygen in their composition. The factors that directly affect D and P are given as Kamlet-Jacobs parameter φ (Politzer & Murray, 2019):

$$\varphi = NM^{0.5}Q^{0.5} \quad (2)$$

where N is the number of moles of gaseous detonation products per gram of explosive, Q is the total heat released by the detonation reaction in calories per gram of explosive, and M is the average molecular weight of the gaseous products. The detonation pressure is then expressed as:

$$P = K\rho_0^2\varphi \quad (3)$$

and the detonation velocity is represented by the equation (Mathieu, 2017):

$$D = A\varphi^{0.5}(1 + B\rho_0) \quad (4)$$

In these equations, ρ_0 is the density of the explosive, and A, B, and K are empirical constants. The final form of these equations is (Politzer & Murray, 2019):

$$P(\text{kbar}) = 15.58\ [NM_{ave}^{0.5}Q^{0.5}\rho^2] \quad (5)$$

$$D(\text{km/s}) = 1.01\ [N^{0.5}M^{0.25}Q^{0.25}(1 + 1.30\rho)] \quad (6)$$

To determine N, M, and Q, it is necessary to predict the detonation products. The detonation process involves a series of reactions and equilibria, resulting in various gaseous compounds. The final products for an explosive containing carbon, hydrogen, nitrogen, and oxygen are usually N_2(g), CO(g), CO_2(g), H_2O(g), H_2(g), и C(s) (Politzer & Murray, 2016, 2017).

However, the proportion of these products depends on external physical factors such as the explosive's loading density, temperature, and other conditions. Gas ratios can be predicted using computer codes or various proposed rules, such as the Kistiakowsky-Wilson, modified Kistiakowsky-Wilson, and Springall-Roberts methods, with the Kamlet and Jacobs rules being the most commonly used (Politzer & Murray, 2014b). These rules predict the formation of N_2(g), CO_2(g), H_2O(g), and C(s), with oxygen more likely to form H_2O(g) rather than CO_2(g). The formation of CO(g) is not predicted by these rules (Politzer & Murray, 2016, 2019).

In practice, it has been confirmed that differences in the assumed compositions of products for a given explosive and loading density have very little effect on D and P. This is due to an unexpectedly balanced counteracting effect (balancing effects apply only to D and P, not to Mave, N, and Q individually, and

can vary significantly depending on the products). For loading densities approaching the densities of pure crystals, the Kamlet-Jacobs rules yield D and P values somewhat closer to experimental results than those obtained from other rules (Politzer & Murray, 2016).

Today, there are many computer programs used for directly calculating detonation parameters. We used the "online molecular modeling platform and resources for atomistic calculations" (Armaković & Armaković, 2023).

FINDINGS

In this paper, nitro derivatives of anthracene, tetracene, and pentacene with formyl, methyl, and fluoro substituents were examined. The values of the total electronic energies were calculated and compared. ESP maps were obtained, and the values of the electrostatic potential above the central parts of the molecules were calculated. Additionally, detonation parameters, D (detonation velocity) and P (detonation pressure), were calculated. Unfortunately, due to the fact that K-J equation was not parametrized for explosives containing atoms other than C, N, O, H, it is only possible to determine the detonation velocity and detonation pressure for molecules that contain only carbon, hydrogen, oxygen, and nitrogen in their structure. Therefore, we were unable to calculate these parameters for the nitro derivatives of these compounds that contain fluorine as a substituent.

RESULTS AND DISCUSSION

Total Electronic Energy of a Molecule

Table 1 provides an overview of the total electronic energies of nitro derivatives of anthracene, tetracene, and pentacene. The compound with the highest stability (lowest energy) is 5,6,11,12-tetraformyl-2,3,8,9-tetranitrotetracene (-1964,52 Eh), while the lowest stability is observed in 9,10-dimethyl-2,3,6,7-tetranitroanthracene (-1436,25 Eh).

Table 1. *Values of the Total Electronic Energies of the Nitro Derivatives of Anthracene, Tetracene, and Pentacene (Expressed in Eh)*

Name of compound	**Energy (Eh)**
9,10-dimethil-2,3,6,7-tetranitroanthracene	-1436,24641607
9,10-diformyl-2,3,6,7-tetranitroanthracene	-1584,21825286
5,6,11,12-tetraformyl-2,3,8,9-tetranitrotetracene	-1964,52546242
6,13- diformyl-2,3,9,10- tetranitropentacene	-1891,51914013
9,10-difluro-2,3,6,7-tetranitroanthracene	-1556,09572199
5,6,11,12-tetrafluoro-2,3,8,9-tetranitrotetracene	-1908,17937930
6,13- difluoro-2,3,9,10- tetranitropentacene	-1863,36162635

By comparing the energy values of the nitro derivatives of anthracene (Table 2), it can be concluded that the energy values are very close, but the molecule with the highest stability is the nitro derivative of anthracene with a formyl group as a substituent.

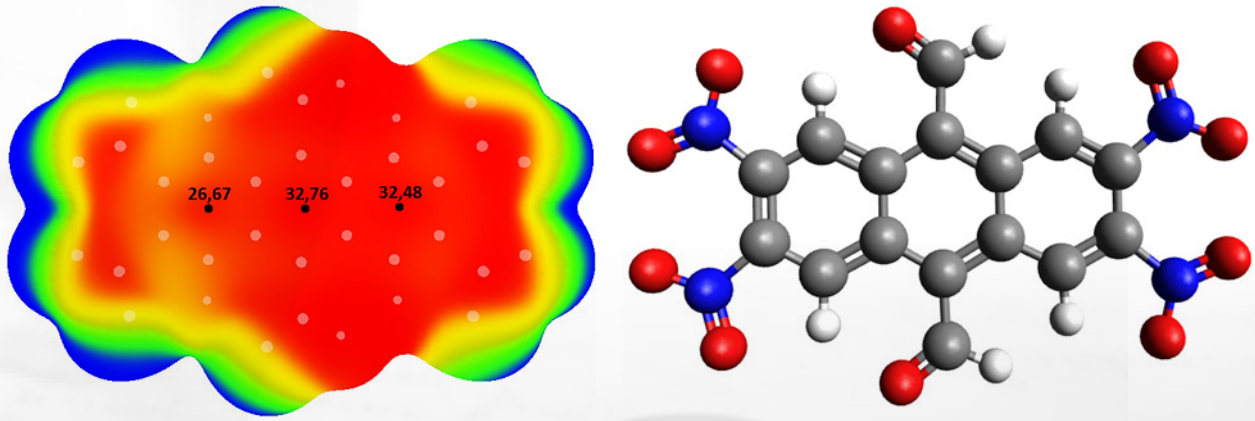
Table 2. *Values of the Total Electronic Energies of the Nitro Derivatives of Anthracene (Expressed in Eh)*

Name of compound	Energy (Eh)
9,10-dimethil-2,3,6,7-tetranitroanthracene	-1436,24641607
9,10-diformyl-2,3,6,7-tetranitroanthracene	-1584,21825286
9,10-difluro-2,3,6,7-tetranitroanthracene	-1556,09572199

Additionally, by comparing the values of the nitro derivatives of tetracene and pentacene, an increase in stability can be observed in molecules that have a formyl group as a substituent. In this case, these are the molecules 6,13-diformyl-2,3,9,10-tetranitropentacene and 6,13-difluoro-2,3,9,10-tetranitropentacene.

Electrostatic Potential Maps

The electrostatic potential map was calculated for the molecule 9,10-diformyl-2,3,6,7-tetranitroanthracene using the previously calculated .wfn file with the B3LYP method and CC-PVDZ basis set, and is shown in Figure 1. The analysis of the charge distribution on the surface of the calculated electrostatic potential for the molecule 9,10-diformyl-2,3,6,7-tetranitroanthracene shows a positive charge at the center of the ring (the energy value at the critical point in the center is 32.76 kcal/mol).

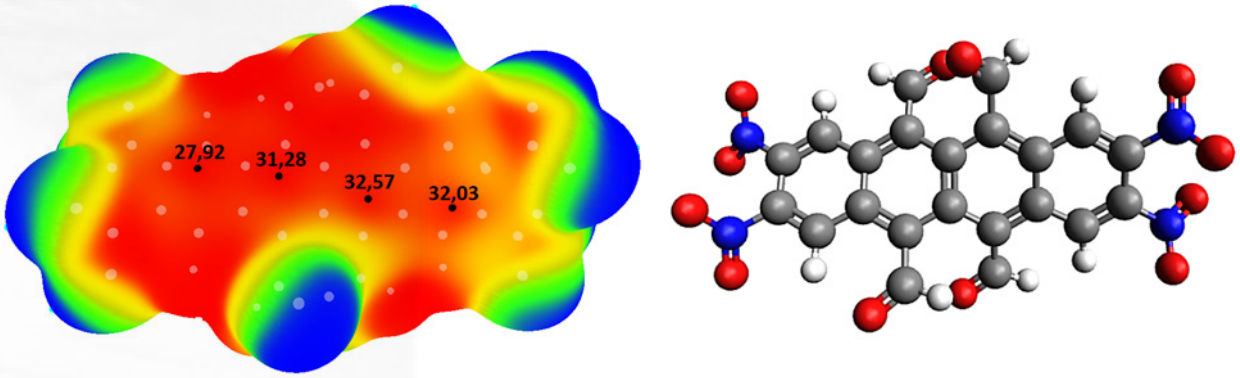


a) b)

Figure 1. *Calculated Electrostatic Potentials on the 0.001 au Surface for A) 9,10-Diformyl-2,3,6,7-Tetranitroanthracene. The Energy Value at the Critical Point Is Expressed in Kcal/Mol. Color Ranges: Red Greater Than 18.82; Yellow from 18.82 to 0; Green from 0 to -9.41; Blue More Negative Than -9.41. The Positions of the Atoms Within the Molecule Are Marked with White Circles. Molecular System Model B) 9,10-Diformyl-2,3,6,7-Tetranitroanthracene.*

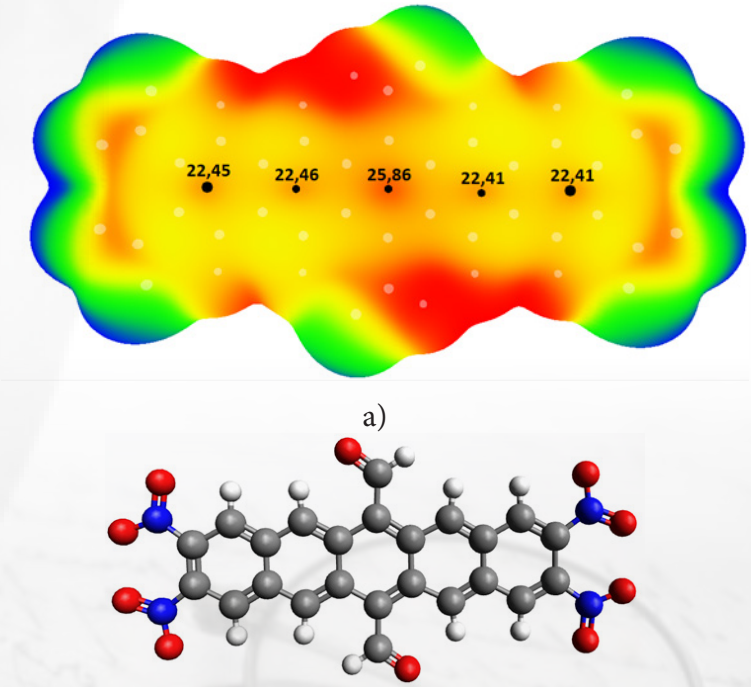
An electrostatic potential map was also calculated for the molecule 5,6,11,12-tetraformyl-2,3,8,9-tetranitrotetracene and is shown in Figure 2. Analysis of the charge distribution on the surface of the calculated electrostatic potential for the molecule 5,6,11,12-tetraformyl-2,3,8,9-tetranitrotetracene indicates that there are two critical points near the center of the molecule. From this, it can be concluded

that the number and arrangement of formyl substituents influence the charge distribution around the center of the molecule.



a) b)

Figure 2. *Calculated Electrostatic Potentials on the 0.001 au Surface for A) 5,6,11,12-Tetraformyl-2,3,8,9-Tetranitrotetracene. The Energy Value at the Critical Point Is Expressed in Kcal/Mol. Color Ranges: Red Greater Than 18.82; Yellow from 18.82 to 0; Green from 0 to -9.41; Blue More Negative Than -9.41. The Positions of the Atoms Within the Molecule Are Marked with White Circles. Molecular System Model B) 5,6,11,12-Tetraformyl-2,3,8,9-Tetranitrotetracene.*

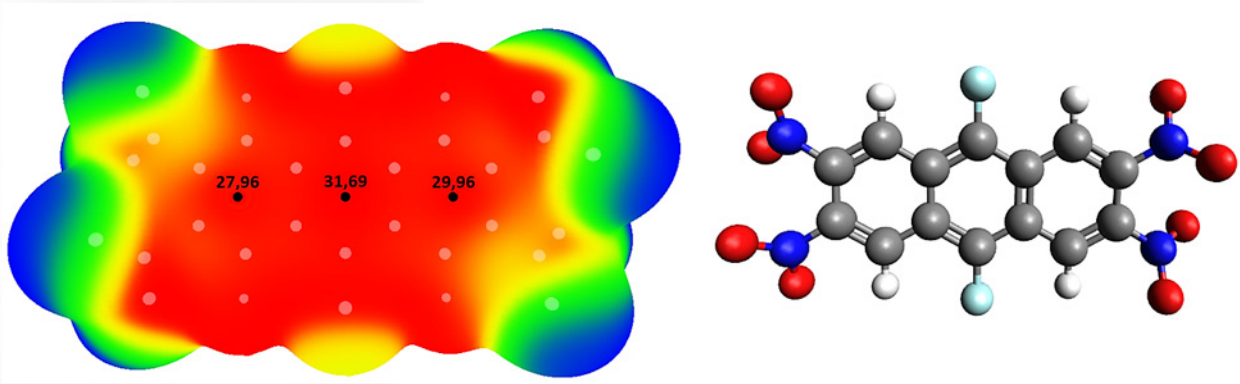


a)

b)

Figure 3. *Calculated Electrostatic Potentials on the 0.001 au Surface for a) 6,13- Diformyl-2,3,9,10-Tetranitropentacene. The Energy Value at the Critical Point Is Expressed in kcal/mol. Color Ranges: Red Greater Than 18.82; Yellow from 18.82 to 0; Green from 0 to -9.41; Blue More Negative Than -9.41. The Positions of the Atoms Within the Molecule Are Marked with White Circles. Molecular System Model b) 6,13-Diformyl-2,3,9,10-Tetranitropentacene.*

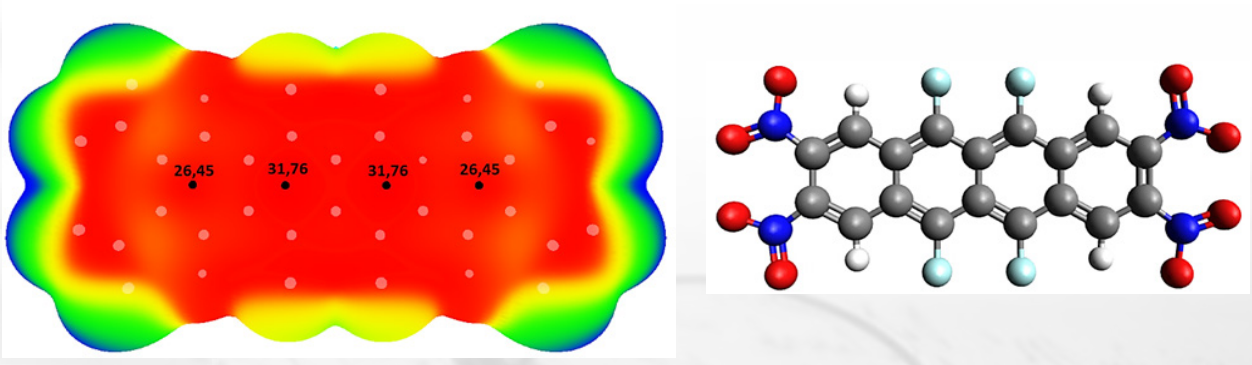
We conducted a comparative overview of the electrostatic potential values above the central parts of the molecules of anthracene, tetracene, and pentacene with a formyl group as a substituent. It can be observed that the highest electrostatic potential value is possessed by the molecule 9,10-diformyl-2,3,6,7-tetranitroanthracene (32,76 kcal/mol). The potential values decrease with the increase in the number of rings in the molecule, so the molecule 6,13-diformyl-2,3,9,10-tetranitropentacene (28,56 kcal/mol) has the lowest electrostatic potential value at the central point of the molecule.



a) b)

Figure 4. *Calculated Electrostatic Potentials on the 0.001 au Surface for A) 9,10-Difluro-2,3,6,7-Tetranitroanthracene. The Energy Value at the Critical Point Is Expressed in Kcal/Mol. Color Ranges: Red Greater Than 18.82; Yellow from 18.82 to 0; Green from 0 to -9.41; Blue More Negative Than -9.41. The Positions of the Atoms Within the Molecule Are Marked with White Circles. Molecular System Model B) 9,10-Difluro-2,3,6,7-Tetranitroanthracene.*

Figure 4 shows the electrostatic potential map for the molecule 9,10-difluoro-2,3,6,7-tetranitroanthracene. As in the previous case, three critical points can be observed above the central parts of the molecule, with the middle one having the highest potential value (31.63 kcal/mol).



a) b)

Figure 5. *Calculated Electrostatic Potentials on the 0.001 au Surface for A) 5,6,11,12-Tetrafluoro-2,3,8,9-Tetranitrotetracene. The Energy Value at the Critical Point Is Expressed in Kcal/Mol. Color Ranges: Red Greater Than 18.82; Yellow from 18.82 to 0; Green from 0 to -9.41; Blue More Negative Than -9.41. The Positions of the Atoms Within the Molecule Are Marked with White Circles. Molecular System Model B) 5,6,11,12-Tetrafluoro-2,3,8,9-Tetranitrotetracene.*

Examples of electrostatic potential maps for the molecules 5,6,11,12-tetrafluoro-2,3,8,9-tetranitrotetracene and 6,13-difluoro-2,3,9,10-tetranitropentacene are shown in Figures 5a and 6a. For the molecule 5,6,11,12-tetrafluoro-2,3,8,9-tetranitrotetracene (26,45; 31,76; 31,76; 26,45 kcal/mol), there are four critical points, with the two around the center of the molecule having the highest value (31,76 kcal/mol).

In the case of the molecule 6,13-difluoro-2,3,9,10-tetranitropentacene (Figure 6), the energy values at the critical points are as follows: 20,73; 20,61; 24,79; 20,72; 20,73 kcal/mol.

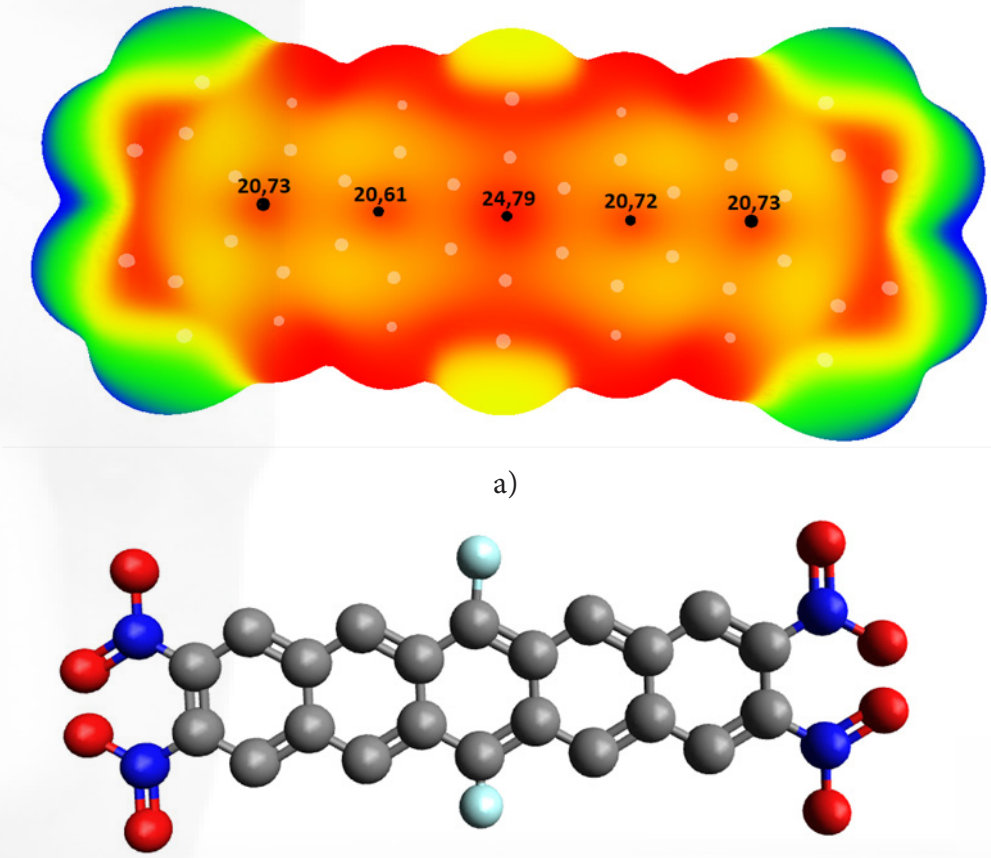
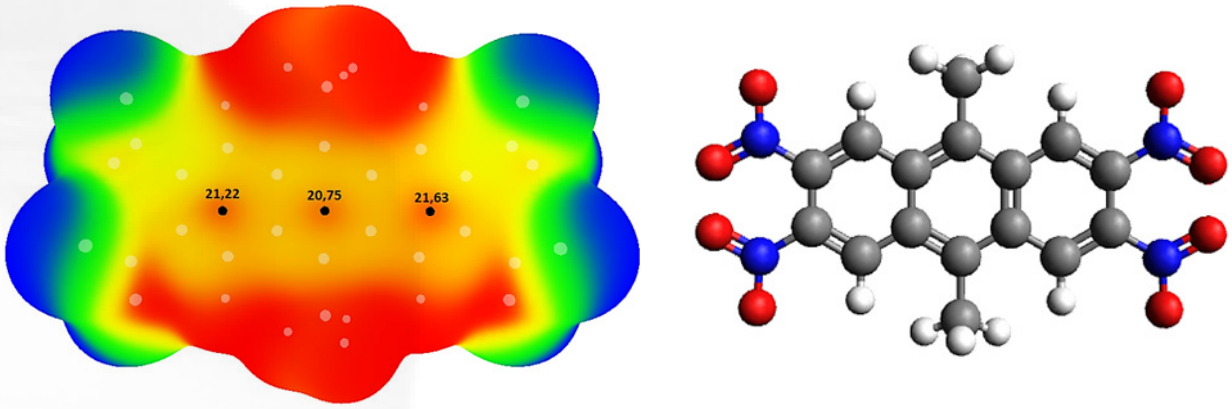


Figure 6. *Calculated Electrostatic Potentials on the 0.001 au Surface for A) 6,13-Difluoro-2,3,9,10-Tetranitropentacene. The Energy Value at the Critical Point Is Expressed in Kcal/Mol. Color Ranges: Red Greater Than 18.82; Yellow from 18.82 to 0; Green from 0 to -9.41; Blue More Negative Than -9.41. The Positions of the Atoms Within the Molecule Are Marked with White Circles. Molecular System Model B) 6,13- Difluoro-2,3,9,10- etranitropentacene.*

It can be observed that, in the case of the molecules 9,10-difluoro-2,3,6,7-tetranitroanthracene (31,69 kcal/mol) and 5,6,11,12-tetrafluoro-2,3,8,9-tetranitrotetracene (31,76; 31,76 kcal/mol), the values at the critical points are very close. In the molecule 6,13-difluoro-2,3,9,10-tetranitropentacene, a decrease in the electrostatic potential value at the center of the molecule is observed (24,79 kcal/mol).



a) b)

Figure 7. *Calculated Electrostatic Potentials on the 0.001 Au Surface for A) 9,10-Dimethil-2,3,6,7-Tetranitroanthracene. The Energy Value at the Critical Point Is Expressed in Kcal/Mol. Color Ranges: Red Greater Than 18.82; Yellow from 18.82 to 0; Green from 0 to -9.41; Blue More Negative Than -9.41. The Positions of the Atoms Within the Molecule Are Marked with White Circles. Molecular System Model B) 9,10-Dimethil-2,3,6,7-Tetranitroanthracene.*

Positive charges also occur in the centers of nitro derivatives of anthracene with a methyl group as a substituent. In the case of the calculated electrostatic potential map for the molecule 9,10-dimethyl-2,3,6,7-tetranitroanthracene (Figure 7), there are three critical points above the central part of the molecule, with potentials of 21,22; 20,75 and 21,63 kcal/mol.

It is noted that the values at the critical points of the molecules 9,10-diformyl-2,3,6,7-tetranitroanthracene (32,76 kcal/mol) and 9,10-difluoro-2,3,6,7-tetranitroanthracene (31,69 kcal/mol) are very similar. The analysis of charge distribution on the surface of the molecule 9,10-dimethyl-2,3,6,7-tetranitroanthracene (Figure 7) indicates that the introduction of the formyl group as a substituent leads to a decrease in the positivity of the potential. The energy value at the critical point around the center of the molecule (20,75 kcal/mol) are lower compared to the molecules 9,10-diformyl-2,3,6,7-tetranitroanthracene and 9,10-difluoro-2,3,6,7-tetranitroanthracene.

Detonation Parameters

Table 3 provides an overview of the calculated values of detonation velocity and detonation pressure for nitro derivatives of anthracene, tetracene, and pentacene with methyl and formyl groups as substituents.

The highest values of detonation pressure and detonation velocity were calculated for the molecule 9,10-dimethyl-2,3,6,7-tetranitroanthracene (335,74 kbar and 8979,49 m/s). Additionally, high values of detonation parameters were observed for the molecule 9,10-diformyl-2,3,6,7-tetranitroanthracene (241,02 kbar and 7354,88 m/s). We can conclude that increasing the number of aromatic rings in the molecule reduces the values of detonation parameters, as seen in Table 3.1, where the molecule 5,6,11,12-tetraformyl-2,3,8,9-tetranitrotetracene has values of (200,84 kbar and 6706,67 m/s), and the molecule 6,13-diformyl-2,3,9,10-tetranitropentacene has values of (164,97 kbar and 6167,89 m/s).

Table 3. *Values of Calculated Detonation Parameters of Nitro Derivatives of Anthracene, Tetracene, and Pentacene*

Name of compound	Detonation Pressure [kbar]	Detonation Velocity [m/s]
9,10-dimethil-2,3,6,7-tetranitroanthracene	335,74	8979,49
9,10-diformyl-2,3,6,7-tetranitroanthracene	241,02	7354,88
5,6,11,12-tetraformyl-2,3,8,9-tetranitrotetracene	200,84	6706,67
6,13- diformyl-2,3,9,10-tetranitropentacene	164,97	6167,89

ORIGINALITY/VALUE

Electrostatic potential plays a crucial role in predicting the sensitivity of explosives. It is well-established that a positive electrostatic potential at the center of the molecules of many C, H, N, O-based explosives correlates with increased sensitivity. For explosive compounds within specific classes, such as nitroaromatics, sensitivity tends to rise as the electrostatic potentials become more positive. The total energies of the investigated molecules were also calculated, and based on that, their stabilities were compared. The results obtained provide valuable insights for predicting detonation parameters and assessing the sensitivity of high-energy molecules. Furthermore, combining experimental and computational methods significantly reduced the volume and time of experimental research, as well as the quantity of chemicals used (Rakić et al., 2023).

CONCLUSION

In this study, we calculated electrostatic potential maps and total electronic energies for nitro derivatives of anthracene, tetracene and pentacene, using the B3LYP functional and the CC-PVDZ basis set in Gaussian 09. We compared the values of critical points at the centers of these molecules.

It is shown that the compound with the highest stability (lowest energy) is 5,6,11,12-tetraformyl-2,3,8,9-tetranitrotetracene (-1964,52 Eh). On the other hand, the lowest stability is observed in the molecule 9,10-dimethyl-2,3,6,7-tetranitroanthracene (-1436,25 Eh).

From the calculated electrostatic potential maps, the molecule with the highest positive potential value above the central region is 9,10-diformyl-2,3,6,7-tetranitroanthracene (32,76 kcal/mol). In accordance with the fact that sensitivity to detonation increases with the positive potential, it is expected that this compound will be the most sensitive.

Additionally, we computed key detonation parameters, including detonation pressure (P) and detonation velocity (D), to evaluate their explosive characteristics.

The compound expected to have the highest values for detonation pressure and detonation velocity is 9,10-dimethyl-2,3,6,7-tetranitroanthracene (335,74 kbar and 8979,49 m/s). However, the introduction of formyl groups resulted in molecules with slightly lower detonation parameters but greater

stability. The increase in the number of aromatic rings led to a decrease in detonation parameters and electrostatic potential.

In conclusion, formyl substitution enhances stability across the nitro derivatives of anthracene, tetracene and pentacene, while increasing the number of rings reduces both detonation properties and electrostatic potential. The balance between charge distribution, stability, and detonation parameters varies significantly with the type of substituent and the number of rings in these compounds.

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NUCLEAR FORENSICS – TECHNIQUES FOR CHARACTERIZATION (EXAMPLE OF NUCLEAR TECHNIQUE USE)

Marija Janković, PhD[1]
Jelena Krneta-Nikolić, PhD
Marija Šljivić-Ivanović, PhD
Nataša Sarap, PhD
Filip Veljković, PhD
Bojan Janković, PhD
Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia
University of Belgrade, Serbia

INTRODUCTION

Nuclear forensics involves the examination of nuclear and other radioactive materials through various analytical techniques to determine their origin, history, and intended use. Key methodologies include gamma spectrometry, which qualitatively and quantitatively determines the individual radionuclide, and dosimetry, for measurement ambient dose equivalent rate. These techniques are critical in tracing the source of nuclear materials and supporting investigations related to security and non-proliferation. Legislation in the Republic of Serbia defines the methods and procedures for radioactivity control during import, export and transit. Radioactivity control is based on measurements performed by authorized legal persons and involves measurements of dose rate of ionizing radiation from the goods and examination of samples by gamma spectrometric method.

Many samples are too complex for all the radioactive isotopes present to be measured directly. By utilizing the differences in chemical properties of the elements, it is possible to devise schemes of chemical reactions to separate and purify elements, or groups of elements, to allow measurement of the isotopes present by radioactive counting methods, or mass spectrometry [IAEA, 2006]. Radiochemistry is especially important to allow measurement of isotopes that are present at low activity and are best measured by their alpha or beta emissions or by mass spectrometry. Radiochemistry, in combination with radioactive counting techniques and mass spectrometry, represents some of the most effective methods for precise radioactivity determination. These approaches allow for the separation, identification, and quantification of radionuclides in complex matrices.

Nuclear techniques, such as alpha, beta, and gamma spectrometry, enable measurement of radioactive decay emissions, providing information of the radionuclides present. On the other hand, mass spectrometry techniques offer high sensitivity and the ability to detect trace levels of radioactive elements.

1 marijam@vinca.rs

DOSIMETRY

There are various types of dosimetry measurements (passive and active, personal dosimetry, dose rate in air etc.). Dosimetry measurements are in wide use in radiation protection, aimed both at continuous control of medical instruments that are using the ionizing radiation sources and exposure of patients and staff operating those instruments [ISO 4037]. Also, dosimetric measurements are readily used to assess the exposure of population to ionizing radiation, as well as a part of nuclear forensic methods, via screening of various spaces and goods that are imported or in transit through the country [Official Gazette of RS, No. 95/18 and 10/19; Official Gazette of RS, No. 86/19]. This is done by measuring the ambient dose rate equivalent, $H^*(10)$, on the surface of the goods, in the transportation vehicle, or inside of the object of interest – ambient monitoring.

According to the legislation of the Republic of Serbia [Official Gazette of RS, No. 86/19], dosimetry measurements are mandatory at the state borders, whenever certain types of goods are imported or in transit. Also, fixed dosimetry portals [Dimović, S. et al. (2023)] are present as a type of early warning system that reacts in the presence of the ionizing radiation of whatever origin.

Dosimeters for ambient dose equivalent rate monitoring used in Radiation and Environmental Protection Department in the Vinča Institute of Nuclear Sciences, are readily exploited in the field work. The Radiation and Environmental Protection Department, Laboratory for the Radiation Measurements is accredited for method of ambient dose rate equivalent measurement according to the ISO 17025/2017 standard and as such, it is able to perform measurement that are both accurate and precise and the results are repeatable and thrust worthy. Most of the instruments used for this purpose are in-house made dosimeters based on compensated Geiger-Muller (GM) tubes as well as several commercially available instruments (such as Ionization chamber and scintillation dosimeter). The stability of the instruments is readily controlled as per requirements of the ISO 17025/2017 standard by measuring the dose of the known standard radioactive source.

In accordance with the Rulebook 86/19, goods that are listed therein have to be controlled by means of the dosimetry measurements. In the moment of the arrival of the goods at the state border, or at the customs point, a dosimetry measurement is performed using a certified instrument. The background ambiental dose rate is measured first, followed by the measurement of the dose rate at the goods and at the place of the transport driver and co-driver, if there is such.

The result of the measurement is then reported in the form of Report on Ambient Dose Rate Equivalent Measurement, which contains, among other relevant data, a conclusion pertaining to the presence of the contamination or source of ionizing radiation. In case of finding the contamination or source of ionizing radiation, the Directorate for the Radiation and Nuclear Safety and Security issues a report which bans the import/transit of the goods. The procedure of measurement and results reporting is defined in the Instructions for Ambient Dose Rate Equivalent Measurement, according to the ISO17025/2017.

Figures 1 – 4 show a typical situation of the dosimetry measurement on the state border.



Figure 1. *Measurement of the Background Dose Rate*

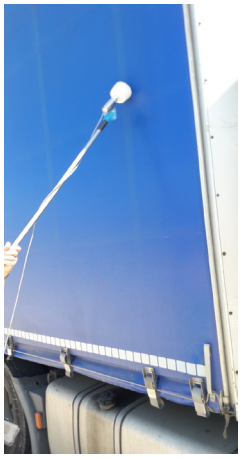


Figure 2. *Measurement of the Ambient Dose Rate Equivalent on the Side of the Truck Transporting the Goods*



Figure 3. *Ambient Dose Rate Equivalent Measurement on the Surface of the Goods*



Figure 4. *Ambient Dose Rate Equivalent Measurement on the Driver's Position*

In case of elevated ambient dose rate equivalent measurement results, further investigation is in order, namely gamma spectrometry, which enables us to determine which radioactive elements are present in the sample of the examined goods and draw more precise conclusions.

For example, results of ambient dose equivalent rate for goods that require dosimetric examination (waste of aluminum and waste of copper) [Official Gazette of RS, No. 86/19], measured by the Radiation and Environmental Protection Department, Vinča Institute of Nuclear Sciences, at one border crossing in the Republic of Serbia using digital radioactive radiation meter DMRZ-M15 show that the ambient dose equivalent rate were in range 0.057 to 0.070 μSv/h for waste of aluminum and from 0.065 to 0.072 μSv/h for waste of copper. No radioactive sources or contamination were found [Janković, M. et al. (2024)].

GAMMA SPECTROMETRY

Gamma spectrometry is a high resolution, non destructive measurement method which allows the identification and quantification of radionuclides present in the examined sample. It produces rapid results by analyzing the interaction of the gamma photons with the detector material. The samples can be measured in their native form or with minimal preparation which greatly reduces the time needed

for the analysis and consumption of chemicals or other resources. Also, this method is convenient for the measurement of low concentrations of radioactive elements and as such, is useful in measurement of environmental samples. It enables us to analyze large number of samples taken in sequence or at particular points and could serve as a tool for determining the origin of the detected radionuclide in the environment from which the sample is taken.

According to the legislation, certain materials undergo mandatory gamma spectrometry measurements. These are various types of natural stones and granites, volcanic stones and ash, various waste products of the mining and metallurgy industry and raw materials that are consequently used in building materials [Janković, M. and Todorović, D. (2011); Janković, M. et al. (2011)]. These papers present the results of concentration of radioactivity content for natural radionuclides: ^{226}Ra, ^{232}Th, ^{40}K, ^{238}U, ^{235}U in coal, slag, and ash samples from coal-fired power plants in Serbia, as well as results of naturally occurred radionuclides in imported zircon samples. All the samples were measured by gamma spectrometry. Also food, feed and water undergoes mandatory control using this technique [Sarap, N. et al (2018)]. Air, soil, surface waters, precipitation and biota samples are readily measured as a part of planned monitoring of the environment in the country [Rajačić, M. et al (2016)]. This is of at most importance, since in the case of any incident or accident involving nuclear facilities, it provides rapid data for the rapid reaction.

Gamma spectrometry produces measurement results in the form of the spectrum. The spectrum consists of all impulses detected by the measurement system, which are a consequence of the interaction of gamma photons with the detector material. As it can be seen in the Figure 5, in the spectrum there are notable peaks which correspond to the detection of gamma photons with certain energy. According to the photon energy present in the spectrum, it is possible to identify which radionuclides are present in the sample. The height of the peaks corresponds to the number of detected photons and the number of the photons corresponds to the activity of the detected radionuclides. That is how we are able to conclude which gamma emitting radioactive elements are present in the investigated sample and in which quantity.

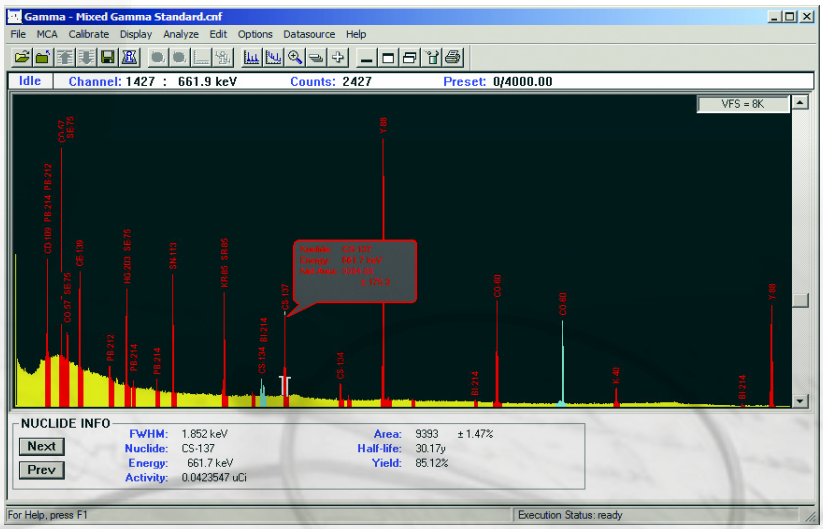


Figure 5. *Spectrum of the Commercial Calibration Standard*

For the completion of the gamma spectrometry measurement, certain steps should be performed. Firstly, an energy and efficiency callibration of the detector system should be performed by measuring a calibration source – an object with known presence of radinuclides and their activity. Knowing

the radionuclides present in the calibration source enables us to correlate the position of the peaks with the known gamma photon energies. The number of detected photons, read from the spectrum, enables us to calculate a detection efficiency of the detector for known geometry and chemical composition of the source [Debertin, K., Helmer, R.G.,1988].

The next step should be providing a sample that is representative of the bulk material that needs to be measured. This is accomplished by following the sampling procedure in each particular situation [EPA/600/R-12/566]. Then, the sample has to be prepared in such a way that it provides the homegeinity of the material and enables placing into a geometry adequate for the measurement on the gamma detector. After that, the sample is placed on the detector and measured [IAEA, 1989].

The analysis of the spectrum resulting from the measurement gives the energies and number of detected photons and the activity of each radionuclide is calculated as follows:

$$A = \frac{N/t}{P_\gamma \varepsilon m} \tag{1}$$

where N is nuber of detected photons with a particular energy, t is measurement duration, P_γ is the probability of the emission of photons with a particular energy, ε is the detection efficiency for given energy and m is the mass of the sample.

The final result of the measurement is then given as the activity concentration (expessed in Bq/kg) for each detected radionuclide.

The obtained activities are then compared to the reference values defined in the Rulebooks and the conclusion is made whether the examined material is in accordance to the limits prescribed by the law.

In all materials that are examined according to the Rulebook on the Limits of Radionuclide Content in Drinking Water, Food, Feedstuf, Medicines, Items of General Use, Building Materials and Other Goods that are Put on the Market (Official Gazette of RS, No. 36/18) and Rulebook on Limits of Radioactive Contamination of People, Working and Living Environment and Ways of Performing Decontamination (Official Gazette of RS, No. 38/11), elements that can be present in samples are so called naturally occurring radionuclides and Cs-137 (a consequence of Chernobyl accident and nuclear trials). All other man made radionuclides should not be present in any material other than some specific materials intended for use in nuclear medicine or industry in which case, these materials and items should have a proper documentation [Official Gazette of RS, No. 25/11 and Official Gazette of RS, No. 50/18].

If however, the presence of man-made radionuclides is detected, licenced laboratory that made the measurement has to notify the Directorate on their findings and steps to discover the origin of those radionuclides have to be taken.

Legislative, presented in Rulebook on Radioactivity Control of Goods During the Import, Export and Transit (Official Gazette RS, 86/19), establishes the mandatory gamma spectrometry measurement of berries, while the limits of radionuclide content in these products is defined in the Rulebook on Limits of radionuclide content in drinking water, foodstuff, feedstuff, medicines, items of general use, building materials and other goods placed on the market (Official Gazette RS, 36/18). The Paper [Rajačić, M. et al. (2022)] deals with the examination of ^{137}Cs in imported or exported berries, measured in Radiation and Environmental Protection Department, Vinča Institute of Nuclear Sciences using gamma spectrometry.

GROSS ALPHA /GROSS BETA

Gross alpha and gross beta activity measurement is a screening analysis that is not intended to give an absolute determination of the activity concentration of all alpha and beta emitting radionuclides in a test sample, but to demonstrate whether a particular reference levels have not been exceeded. The method covers non-volatile radionuclides, since some gaseous or volatile radionuclides (e.g. Rn-222 and I-131) can be lost during the sample preparation. It is applicable to test samples of drinking water, rainwater, surface and ground water as well as cooling water, industrial water, domestic and industrial wastewater after proper sampling, sample handling, and test sample preparation [ISO 10704:2019, EPA, 1980]. Also it can be used for samples of aerosol, swipes, sediment and soil as well as samples of food and biota, after an appropriate preparation is performed.

This method is applicable to the measurement of alpha emitters having energies above 3.9 mega electron volts (MeV) and beta emitters having maximum energies above 0.1 MeV.

Given that the range of alpha particles is several cm in air and even less in a medium, the samples have to be prepared in such a way that ensures that after the preparation, all that is left is a thin layer of material that contains all alpha and beta emitters that were present in the sample in its native state. This means the evaporation of liquid samples or taking small aliquots of solid or powdery materials that are homogenized prior to the measurement. For some purposes, when a specific alpha or beta emitter is measured, some chemical preparation should be applied, so that other elements that could potentially interfere with the measurements are eliminated. That is why this method is not non-destructive and at times, can be time consuming [Janković, M. et al. (2015)].

The most used type of detector for gross alpha/gross beta measurements is gas - flow proportional counter. The principal on which it works is the ionisation of the gas present in the detector system, as a consequence of the interaction of alpha or beta particles with the gas. The number of pairs crated in these interactions is proportional to the energy of the particle emitted from the sample and thus the counting of detected particles as well as their discrimination to alpha or beta is enabled.

For absolute gross alpha and gross beta measurement, the detectors must be calibrated to obtain the ratio of count rate to disintegration rate. Americium - 241 (used for alpha activity in the collaborative test of this method) has higher alpha particle energy and Radium - 226 radionuclides but is close to the energy of the alpha particles emitted by naturally occurring radionuclides, trontium-90 and cesium-137 have both been used quite extensively as standards for gross beta activity. Sample weight stability is essential to gross alpha and gross beta measurements to ensure the accuracy of the self-absorption counting efficiency factor to be used for the samples. Strontium-90 in equilibrium with its daughter yttrium-90 is the prescribed radionuclide for gross beta calibrations.

The procedure for the measurement dictates the steps that need to be taken in order to assure valid measurement results. Firstly, the sample needs to be prepared (using evaporation or chemical separation or coprecipitation, or some other method depending on the type of the sample) so that thin layer of the aliquot of sample is obtained and placed in the measurement geometry. Then, the sample is put into the detector and the result of the count is used to calculate gross alpha and gross beta activity of all present radionuclides, following the equation

$$A_{\beta} = \frac{(R - R_0)}{\varepsilon \cdot m(V)} \tag{2}$$

where $A_{\alpha\beta}$ is the gross alpha or gross beta activity expressed in Bq/kg or Bq/l, R is the count of the sample, R_0 is the count in background, ε is the efficiency of the counting (obtained via calibration procedure) and $m(V)$ is mass or volume of the sample represented by the measured aliquot.

According to the legislation in Serbia, drinking water is subject to the mandatory gross alpha/gross beta measurement. The limits are set to 0.1 Bq/l for gross alpha and 1.0 Bq/l for gross beta activity. These limits provide that the ingestion dose from 730 l of water per year does not exceed 0.1 mSv/y [Official Gazette of RS, No. 36/18]

If the measurement results show values above these limits, an additional measurement aimed to identify the presence of individual radionuclides should be performed, usually by means of gamma spectrometry [Official Gazette of RS, No. 36/18].

The limit set for tritium which is so called soft beta emitter, is 100 Bq/l. Presence of tritium in various types of natural water such as river and lake water, can be used as an indicator of an accidental situation in a nuclear facility [M.Janković et al. (2024)]. Then further investigation should be performed by sampling the water bodies closing to the nuclear facility in order to determine whether there is a possible leakage and to determine, if possible, the precise position where the excess tritium entered a water body.

Planned and regulated monitoring of surface and ground water, precipitation and drinking water establishes the baseline for all other measurements conducted for the purpose of control.

MASS SPECTROMETRY

Mass spectrometry is an analytical technique for examining matter by forming ions in the gas phase that are detected and characterized based on the ratio of mass (m) and charge (z). Thanks to the fact that mass spectrometry provides both qualitative (identification and structure of compounds) and quantitative (molar mass and/or concentration of sample components) information about the investigated substance, it is used today in areas such as biochemistry for the analysis of proteins, peptides, oligonucleotides, lipids, steroids and polysaccharides; physical chemistry for studying the fundamental laws of the gas phase of ions, kinetics of reactions, as well as for determining thermodynamic parameters; inorganic analytical chemistry; atomic physics; pharmacy for the discovery of new drugs, pharmacokinetics and many others; clinical tests such as diagnosing various diseases, drug testing, hemoglobin analysis; geology for the study of isotopes or oil composition; forensics for identification of unknown samples; industry for process flow monitoring etc.

A modern mass spectrometer contains the following components: input for the substance being tested; ionization source, which is necessary to convert the neutrals of the tested substance into ions; one or more mass analyzers for ion separation (in modern instruments, analyzers are also used as fragmentation chambers); detector that registers the ions leaving the last analyzer. In some devices, individual components, such as neutral sources and ionization sources or/and mass analyzers and detectors, can be combined into unique units [De Hoffmann E., Stroobant V. (2007); Van Bramer S. E. (1998)].

Components such as the ion source, mass analyzer and detector in most mass spectrometers are located in a vacuum system, under high voltage, which allows the unhindered movement of ions to the detector without collision with molecules of other gases.

The following processes take place in each mass spectrometer:

- formation of ions from the sample in the ionization source;

- separation of the formed ions based on the ratio of mass and charge in the mass analyzer;
- fragmentation of the obtained ions and analysis of the fragments in the next analyzer;

Ionization Techniques

The ion source is a part of every mass spectrometer and its role is to convert neutral molecules or atoms of the analyte into charged particles, that is, ions. Thus, the ion source is part of the mass spectrometer in which the key process during the analysis, the ionization of the analyte, takes place [Arevalo Jr et al. (2019)]. Ionization is the most important stage in the analysis in mass spectrometry because the success of the analysis depends mostly on the way of converting a neutral compound into an ionic species in the gas phase. The ionization process is carried out by supplying energy to the molecule, resulting in the release or acceptance of electrons by the analyte, which creates a cation radical [M+•] (molecular ion radical) or anion radical [M-•], which represent the molecular mass of the given compound. In addition, the compound can accept or lose a proton, resulting in a protonated [M+H]+ or deprotonated [M-H]- molecular ion. Fragmentation also occurs during the ionization process. Fragmentation is a desirable process during analysis because the appearance of fragments in the spectrum indicates parts of which the molecule is composed. Which fragments will be formed depends primarily on the relative stability of the bonds in the molecular ion and on the stability of the resulting ions. A wide range of ionization techniques has been developed, and the choice of technique depends on the nature of the sample and the desired data. Some of the ionization techniques are [Chhabil Dass, (2007)]: Electron ionization (EI), Fast Atom Bombardment (FAB), Chemical ionization (CI), Atmospheric pressure chemical ionization (APCI), Atmospheric pressure photoionization (APPI), Matrix assisted laser desorption/ionization (MALDI), Electrospray ionization (ESI), Thermospray ionization (TSP), Field ionization/desorption (FDI) and Plasma desorption (PD).

The choice of technique depends on the nature of the sample, i.e. the aggregate state of the sample. Suitable ionization techniques for gas sample ionization are electronic ionization, chemical ionization, and desorption field ionization, therefore their use is limited to nonpolar to moderately polar, volatile, and thermostable analytes. If the sample is in a liquid aggregate state, the analyte is introduced into the ion source in the form of droplets, and this is achieved using thermospray ionization, electrospray ionization or chemical ionization at atmospheric pressure. Analytes analyzed from the liquid phase must be non-volatile, ionic or weakly polar. Solid-state samples where the analyte is polar, non-polar or ionic undergo preparation that involves dissolving the sample in a suitable solvent and mixing with the matrix, and are ionized by techniques such as plasma desorption, matrix-assisted laser desorption/ionization or fast atom bombardment [Gross, J. H. (2017)].

Ionization techniques can be divided depending on the amount of energy that is used, or rather delivered to the molecule. Based on this, “hard” and “soft” ionization techniques are distinguished. Hard techniques, such as electron ionization, are techniques that deliver more energy and lead to intense fragmentation of molecules, and are used for molecules that do not disintegrate easily, providing information about their structure. On the other hand, soft ionization techniques produce mostly ions of molecular species and this group includes chemical ionization, electrospray ionization, chemical ionization under atmospheric pressure, matrix-assisted laser desorption/ionization, fast atom bombardment, plasma desorption [Chhabil Dass, (2007); Gross, J. H. (2017)]. In the following, the most well-known ionization techniques that are applied for various researches and tests are described.

Matrix Assisted Laser Desorption/Ionization

Matrix Assisted Laser Desorption/Ionisation (MALDI) is considered one of the most powerful and sensitive soft ionization techniques [Veljković, F. et al. (2024)]. Michael Karas and Franz Hillenkamp made the biggest contribution in development of this simple technique, which significantly improved the capabilities of mass spectrometry. Thanks to sensitivity, high resolution and compatibility with high-throughput analysis, the technique has found great application for the analysis of non-volatile compounds of high molecular weight such as proteins, nucleic acids, saccharides, synthetic polymers and other organic molecules.

MALDI analysis begins with the preparation of a mixture of sample and matrix, which is deposited on a specially designed MALDI plate. The plate is made of metal and on it there are fields on which the prepared mixture is applied [https://www.creative-proteomics.com/technology/maldi-tof-mass-spectrometry.htm]. The preparation of the sample and matrix mixture is done in one of three possible ways. Some of the methods of preparation are: direct mixing of the sample and the matrix, applying the sample and then the matrix directly to the tile or the "sandwich" method where the matrix-sample-matrix is placed on the tile [Cho et al. (2015)].

The mixture applied to the plate is air-dried, and then the plate is inserted into the ion chamber under vacuum. The analyte is co-crystallized with a solid matrix that can absorb the wavelength of light emitted by the laser. MALDI directly ionizes and vaporizes the analyte from the solid phase, and the ions are produced by a pulsed laser [Glish, G. L. and Vachet, R. W. (2003)]. The laser pulse hits the crystal surface of the mixture and after a very short time the place heats up, the matrix absorbs the laser energy and desorption of analyte molecules from the surface of the field occurs, followed by ionization, i.e. translation of analyte molecules into the gas phase. During this process, analyte molecules are ionized by protonating or deprotonating with nearby matrix molecules [https://www.creative-proteomics.com/technology/maldi-tof-mass-spectrometry.htm]. The formation of individual protonated analytes by this technique is typical, the formation paths are numerous, but the mechanism by which they are formed is not completely clear. Due to the pulsed nature of the laser, ions are formed in discrete events, and MALDI achieves very high levels of sensitivity because very little sample is lost during analysis. Also, only singly charged ions are generated with this technique. The advantage of the technique is high tolerance to salts and buffers, the analyte can be dissolved in both polar and non-polar solvents. The method is fast and reproducible and provides a high level of accuracy in the detection of ionic species.

Lasers, which are the most important source of light, can be of ultraviolet (UV) or infrared (IR) wavelengths. The characteristic of UV lasers is the emission of pulses lasting 3-10 ns, while IR lasers emit 6-200 ns. UV lasers have a greater advantage because short pulses perform a sudden ablation of the sample layer, and thermal degradation of the analyte is avoided for a short period of ion generation.

MALDI matrices used for the desorption and ionization process of the sample are mostly weak organic acids. The correct choice of the matrix is the key to the success of the analysis. The MALDI matrix must efficiently absorb laser radiation, have a low vapor pressure and good stability in vacuum, preferably have a low molar mass in order to evaporate more easily and give a mass spectrum that is easy to interpret, have good solubility in solvents that are at the same time analyte solvents [Gross, J. H. (2017).]

The function of the matrix is to dilute and isolate the analyte molecules from each other, by absorbing the laser radiation, thereby protecting the molecule. The matrix absorbs laser energy, converts it into thermal energy and creates ions from large molecules without their fragmentation.

A TOF (Time Of Flight) analyzer or mass analyzer based on the flight of ions performs separation based on the time it takes for ions of different masses to reach the ion source to the detector. This separation method requires a precise definition of the conditions at the beginning of the ion movement, i.e. at the moment of leaving the ion source. The resulting ions are accelerated, towards the flight tube, by the potential difference between the electrode and the extraction mesh, and in this space all ions receive the same kinetic energy [De Hoffmann, E. and Stroobant, V. (2007); Van Bramer, S. E. (1998)].

The TOF analyzer uses an electric field that accelerates the ions at the same potential. As the mass resolution is proportional to the flight time and the ion path traveled, one of the solutions to increase the resolution of these analyzers is to extend the ion flight tube. However, tubes that are too long reduce its performance due to the loss of ions in collisions with gas molecules that may be found in the tube. The time of flight can be increased by decreasing the ion acceleration voltage, which can lead to a decrease in the sensitivity of the method. This can be avoided by introducing a reflective field, which ensures that ions of the same m/z ratio arrive at the detector at the same time [Mamyrin, B. A. (2001)]. The advantage of the TOF analyzer is that it is one of the fastest mass spectrometric analyzers, has high ion transmission and the highest mass range among mass analyzers, and is most suitable for combining with the MALDI technique [Janković et al. (2023)].

FOURIER TRANSFORM INFRARED (FT-IR) SPECTROSCOPY

The FT-IR has proven to be the valuable experimental tool for the forensic scientists at the macroscopic levels. In considered case, FT-IR represents a quick and non-destructive analysis method for analyzing the samples about 10 microns. This instrumental technique may have many applications for analysis of forensic samples, such as identification of illicit drugs, finger-prints, gun-shot residues, explosives, pharmaceuticals, etc. Recent advances have allowed this technology to be extended further, by using attenuated total reflection (ATR) sub-technique within FTIR spectroscopy. FT-IR is the analysis of infrared light interacting with molecules. It measures the amount of light the chemical bonds of sample absorbs. All molecules have specific frequencies that they vibrate at, caused by the specific energy levels, which are associated with bonds inside the molecule. In the current analysis, infrared radiation is transmitted through a sample. Some of the infrared radiation is absorbed by the sample, and some of infrared radiation is transmitted through the sample. The resulting signal at the detector is a spectrum representing a molecular "fingerprint" of the sample. Like a human fingerprint, no two different molecular structures produce exactly the same infrared spectrum (although some can be very similar). This FT-IR spectrum can be automatically compared to the library of the compounds, for a computer generated most-likely best fits. In that case, the forensic chemist must apply the knowledge of chemicals and chemical interactions, pertinent to the incident in order to definitively identify the compounds found in the spectra. Relying only on the computer generated best fit can leave the compound identification open to identification.

LASER-ABLATION-INDUCTIVELY-COUPLED PLASMA-MASS SPECTROMETRY (LA-ICP-MS)

The LA-ICP-MS is an elemental and isotopic microanalytical technique that is increasingly used for routine analysis in forensic laboratories around the world, due to its great discriminating power between samples and its capacity for analyzing solid evidence of the small sizes. LA-ICP-MS has quasi-non-destructive character that may advantage for samples analyzing in forensic sciencies. The main

forensic applications of LA-ICP-MS have been developed for glass and paint samples. In the forensic field, the adjustment of instrumental analytical parameters, the study of interferences produced by fractionation and polyatomic ions, and statistical treatment of data are considered of the great importance. LA-ICP-MS is an effective technique for the direct analysis of solids without requiring their dissolution. LA-ICP-MS is especially recommended to overcome limitations regarding the sample size generally associated with forensic analysis. Its quasi-non-destructive nature also allows that samples already analyzed by LA-ICP-MS to be available for a complementary analysis. In addition, its excellent sensitivity, accuracy and precision, combined with its capacity for isotopic and multi-elemental identification, LA-ICP-MS acts as indispensable experimental technique in the forensics.

SCANNING ELECTRON MICROSCOPY (SEM)

Scanning electron microscopy (SEM) is a powerful imaging technique, where a focused beam of electrons is scanned over the surface of a sample for high-resolution analysis. SEM can offer detailed information regarding the morphology and the elemental composition of the surface. This can prove to be invaluable in the analysis of various types of evidence in forensic science. One of primary applications of SEM in forensic science is trace evidence analysis, a branch of forensic science that involves an examination, the comparison, and interpretation of small and microscopic materials. These materials can include fibers, hairs, glass fragments, paint chips, soil particles, plants, gunshot residue, etc. Trace evidence analysis aims to link these materials to specific sources or individuals, providing valuable information in the criminal investigations. Scanning electron microscopes play a crucial role in examining and characterizing trace evidence by providing key information about the sample including: a) High-resolution images - powerful imaging capability of SEM enables forensic scientists to visualize trace materials at high magnification and resolution. It facilitates a detailed examination of the surface morphology, texture, and structural features of trace evidence. By providing a closer look at the microtopography of fibers, particles, or other materials, SEM assists in their identification and differentiation, b) Elemental composition - Energy-Dispersive X-ray Spectroscopy (EDS) detects and analyzes the X-rays emitted when the sample is bombarded with electrons in the SEM. EDS can be used to perform elemental analysis enabling the identification and quantification of elements present in trace materials. This capability is useful in identifying unknown substances, such as drugs, explosives, or chemical residues, which can provide critical insights into the nature of a crime or aid in the identification of illicit substances. SEMs can analyze samples such as hair and fibers and paints, as well as particulates, entomological materials and gunshot residue. Namely, the gunshot residue analysis is specialized branch of the forensic science, which focuses on the trace evidence left by the suspect shooters. Discharged firearms release microscopic particles in the cloud of smoke which then deposit on surrounding surfaces, and the hands which pulled the trigger. The telltale signs that indicate when a firearm has been used in a crime, consist of particles with lead (Pb), barium (Ba), and antimony (Sb) traces, though some the lead-free primers, are rising in the abundance and becoming more relevant in investigations. Many components of weapon, such as primer ingredients, bullets, barrel, casing, and propellant (gunpowder), influence the elemental concentration of Pb, Sb, and Ba in particles.

X-Ray Diffraction (XRD) Analysis

The decisive advantage of X-ray diffraction (XRD) method in the forensic science is based on the unique character of the diffraction patterns of crystalline substances, the ability to distinguish between elements and their oxides, and possibility to identify chemical compounds, polymorphic forms, and

mixed crystals by a non-destructive examination. This particular quality of X-ray diffraction examinations in the forensic science was verified by comparison of diffraction patterns from iron, from iron oxides, and from iron oxide hydroxide [Janković, B. et al. (2024)]. These substances are used as pigments in paints. In comparison with other methods, X-ray diffraction examinations in these cases provide additional information about the chemical and physical properties, and make it possible for further useful discrimination of materials. The type, the amount, and consistency of the suspected contact trace specimen, the involved contact trace carrier, and forensic questions raised by the criminal offense determine the diffraction method used, strategies of measurement applied, and the sample preparation technique selected. XRD as non-destructive technique requires minimum sample preparation prior to an analysis. The only requirement is that the sample should be homogeneous in nature, so as to provide uniform analysis results even if a small portion is analysed from the bulk quantity. Samples commonly received for forensic testing commonly include: a) building materials such as cement, concrete, steel rods, bricks, etc., b) drugs of abuse and other banned substances, c) residues from site of arson such as kerosene oil, gasoline or cotton lints, d) the explosive residues and splinters from sites, e) the assault samples such as torn garments, broken glass, cosmetic marks, etc., and f) theft and robbery site samples which include gunshot residues, tools, murder weapons, forged documents, blood residues, etc. Samples can be analyzed by the XRD if it exhibits a degree of crystallinity, even if the remaining content is the amorphous. The technique helps to establish the presence or absence of the particular material, through comparison against the reference of XRD data base.

X-Ray Fluorescence (XRF) Microscopy

The X-ray fluorescence (XRF) is a very useful and versatile tool to forensic scientists. It is a non-destructive technique, which is particularly advantageous if the sample is limited or further analysis is needed. Not only is it a non-destructive technique, it requires essentially no sample preparation. The first step in the analysis of the sample is the production of an X-ray, formed in a source which contains a wire (often tungsten) and an anode. A cathode releases electrons which accelerate towards the anode where they impact, resulting in to emission of an X-ray. When X-rays strike the material under the analysis, they can either be absorbed by atoms or scattered. If absorbed, the X-ray transfers all of its energy to the innermost electron of an atom. This is known as the photoelectric effect. Provided the X-ray has adequate energy, electrons are then ejected from the inner shells of the atom, thus creating vacancies in the electron orbitals. In order for the atom to return to an electronically stable state, outer electrons transfer to the inner shells, releasing X-rays in the process at wavelengths specific to the atoms present. This is known as X-ray fluorescence. These X-rays are characteristic to the particular element, and it is this feature that allows for elemental composition to be established. However as the atom is returning to its original stable state, it may sometimes transfer the excitation energy to one of the outer electrons, causing the electron to be ejected. This is referred to as an Auger electron, and can cause problems in detection in terms of competition. The emitted X-rays are then detected. XRF instruments are typically one of two types: Energy-dispersive (ED) or Wavelength-dispersive (WD). The EDXRF systems use the semi-conductor-like detectors which, having an received the emitted spectrum from the sample, transfer it into the histogram of numbers of counts against photon energy.

X-ray fluorescence is a particularly beneficial tool to forensic scientists, for a number of reasons: a) it is non-destructive technique and the sample is left intact after analysis, and b) particularly advantageous if the amount of sample is limited or further analysis is required. Naturally in the forensic science there may be only a limited amount of sample recovered. Compared to certain other analytical techniques it is fast, requiring very little sample preparation as material can often be analysed as is (perhaps requir-

ing homogenisation first) and producing results in minutes, thus multiple analyses can be carried out in a shorter space of time.

The XRF instrument has a wide range of potential applications in the forensic science. It is particularly beneficial in the analysis of rocks, soils and other similar substances, allowing the analyst to compare the composition of these samples. This could be used in suggesting whether two similar-appearing soils are likely to have originated from the same source, or if they are different, based on the various elements detected. The inks and paints are particularly suitable for analysis by XRF technique, as they typically contain metallic pigments which can differ wildly between different brands and batches. The forensic analysis of writing and printer inks can be of particular importance in the investigation of questioned documents, for instance in aiming to establish whether two documents may have been written using the same ink. Furthermore, the identification of gunshot residues can also be achieved using the XRF technique. When a gun is discharged, minute particles from the firearm, bullet and gunpowder are propelled from the weapon, often onto the hands and clothing of the shooter. As the composition of gunshot residue is reasonably well documented and composed of compounds that are not typically present on the person's hand, the XRF can be applied to a piece of clothing or even an individual's body to ascertain, if such residues might be present, an indicating whether or not they could have fired a weapon recently.

CONCLUSION

Forensic examinations, and among them nuclear forensics as a special branch, are very specific examinations that can provide key information in particular investigations. Using isotopic, chemical and physical characteristics of nuclear and other material, together with related forensic evidence to include DNA, hair, fingerprints, tool marks and explosive residues, nuclear forensics can potentially link samples of interest to people, places and events. Nuclear forensics has a number of specific techniques and methods at its disposal, among which, dosimetry, gamma spectrometry, alpha and beta radiation measurements and mass spectrometry are one of the most prominent and useful. Dosimetry and gamma spectrometry are useful in case of some important considerations when it is necessary to collect and preserve evidence and properly sequence non-destructive ahead of destructive analysis in the laboratory. While dosimetry provides the most rapid information, gamma spectrometry has the advantage of providing radionuclide content information as well as activity concentration in the measured samples. Gross alpha/gross beta measurements are used for rapid screening, much as the dosimetry, but for alpha and beta emitting radionuclides that are of the special interest and often cannot be detected using dosimetry alone. For this type of measurement, the sample has to be properly prepared and therefore destroyed, but at the same time, gross alpha/gross beta measurements can be followed by gamma spectrometry if needed. Mass spectrometry in its variety of techniques, provides most precise and detailed results but the sample preparation is complicated, obtaining the results is time consuming and it is not applicable for field measurements.

All the methods available for the nuclear forensics can and should be used in combination, in proper sequence and in planned manner. In that case, the information gathered is both rapid and precise and can provide an invaluable insight in these specific investigations.

Acknowledgement

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DRUG USE STATISTICS IN SERBIA: ANALYSING A POPULATION'S DRUG USE STANCE ON CANNABIS LEGALISATION

Jelena Uvalić, MSc*
Dragana Jovanović, MSc**
Ana Branković, PhD*
Snežana Đorđević, PhD***
Biljana Koturević, PhD[1]*
*Department of Forensic Sciences, Faculty of Forensic Sciences and Engineering
University of Criminal Investigation and Police Studies, Belgrade, Serbia
**Pharmacy Institution "Medikament", Belgrade, Serbia
***National Poison Control Center, Military Medical Academy
University of Defence, Belgrade, Serbia

INTRODUCTION

The Annual Report of the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) for the year 2023 indicates that illegal drugs are present in many places. It seems that almost every psychoactive substance can be found on the market, and it is challenging to avoid their growth, availability, and subsequent harmful consequences. A study on adolescent substance abuse in Serbia (Janicijevic et al., 2017) reveals widespread use among youth, with 73 % smoking, 56.5 % consuming alcohol, and 24.2% abusing drugs. This study links substance abuse to mental health issues and social instability. Furthermore, an analysis by the Drug Policy Network South East Europe (2008–2019) reports 735 drug-related deaths, with a 72.73 % increase in recent years, particularly affecting young adults. The rising fatalities, especially from opioids like heroin, highlight a growing addiction problem in Serbia. The situation has escalated to epidemic proportions, with a notable increase in prescription drug abuse, particularly medications for pain and generalised anxiety disorder. Research by Abrams, NIDA, Obradović-Salcin et al., Olashore et al., Admasu Basha et al., and Bhandari et al. indicates that the age of the first use of psychoactive substances is decreasing (Abrams, 2024), (NIDA, 2022), (Obradović-Salcin et al., 2019), (Olashore et al., 2018), (Admasu Basha et al., 2023), (Bhandari et al., 2021).

The data from the 2022 annual report of the European Drug Monitoring Center (EMCDDA) estimate that around 83.4 million people or 29 % of adults (aged 15 to 64) in the European Union have consumed illicit psychoactive substances at some point in their lives. This figure includes more men (50.5 million) than women (33.0 million) (EMCDDA (2022), (European Drug Report, Luxembourg 2022). By 2030, demographic factors predict an 11 % increase in the number of people who use drugs worldwide. The most abused psychoactive substance is cannabis, with over 22 million European adults reporting its use in 2021 – 2022 (World Drug Report 2021, United Nations publication, Sales No. E.21. XI.8). Δ9-THC, the primary cannabinoid responsible for most of the psychoactive properties of cannabis, is linked to the development of mental health disorders in chronic users. However, according

1 biljana_koturevic@kpu.edu.rs

to the World Drug Report (2021), the percentage of adolescents who consider regular cannabis use to be harmful has dropped by as much as 40 percent between 2000 and 2019, with a slightly higher percentage drop in the territory of the United States of America compared to Europe. New forms of cannabis products with high potency Δ-9-THC, i.e. edibles, vape and other products are in some cases marketed and packaged in a way that appeals to children and adolescents (International Narcotics Control Board - Report, 2022). A significant concern is the varying and unpredictable potency of cannabis-based products, which is largely dependent on the initial concentrations in the plant and the applied extraction method (Koturević & Branković, 2014). In some parts of the world, the potency of cannabis products is almost four times higher than before (World Drug Report 2021, United Nations publication, Sales No. E.21 .XI.8).

Cannabis-based herbal products can be found in various parts of the world, alongside ready-made medicine, which are legal or illegal depending on local regulations. Ready-made medicines are legalised in many countries, while herbal products are still illegal. This difference primarily stems from the more extensive research and clinical studies conducted for ready-made medicines, which allow for accurate dosage determination, specific indications, monitoring of side effects, and assessment of therapy success (Kalant & Porath-Waller, 2016), (Veit, 2023), (Grof, 2018). Cannabis-based plant material and plant products are challenging to standardise due to their diverse composition, including approximately 500 compounds, a number that continues to grow with ongoing research. The medicinal value of herbal products is not easy to assess. However, some countries have accepted them for legal use. According to the European Union Directive on Medicinal Products (European Parliament and Council, 2001), medicines under international control must be distributed on prescription, while herbal medicines, with a simplified registration procedure (based on the traditional use), are usually dispensed without a prescription. Major challenges in regulating cannabis products include characterising and standardising cannabinoids and other chemical constituents of herbal cannabis, assessing their stability in stored medicinal products, and ensuring that herbal cannabis products are not contaminated by microbes and fungi, heavy metals and pesticides (Hall, 2018).

The European Medicines Agency (EMA) and the US Food and Drug Administration (FDA) are the two main agencies responsible for evaluating, approving and monitoring the use of medicines. In the EU, there are two ways to market a drug: through the EMA, where the approval is valid in all EU countries, or through national competent authorities, where the drug is allowed for use only in the country where it was approved (Van Norman, 2016). However, many European countries have allowed the use of certain hemp-based medicines through their national authorities (Kieffer, 2017). The FDA, like the EMA, has not approved hemp-based drugs, but numerous states have approved the use of hemp for medical purposes. The FDA has approved the use of cannabidiol (Epidiolex®) (FDA, 2018), the synthetic cannabinoid nabinol (Cesamet®) (FDA, 2006), and dronabinol (Marinol® and Syndros®) (FDA, 2004), (FDA, 2017). Vučinić et al. observed an increasing prevalence of patients being treated for substance overdose with novel psychoactive substances that are available on the illicit drug market in Serbia (Vučinić et al., 2018). The sale of already made cannabis-based medicines in some countries is regulated by the prescription of a double prescription, i.e. in the manner in which opioid analgesics are sold in the Republic of Serbia, while in some countries it is regulated by issuing special cards (Goločorbin-Kon et al., 2015). For medical purposes, the application of cannabis has the most potential in pain therapy, therapy of viral and bacterial diseases, therapy of disorders of the gastrointestinal system, therapy of insomnia, anxiety and depression, therapy of Alzheimer's disease, therapy of epilepsy, therapy of multiple sclerosis, therapy of urinary system disorders, therapy of hypertension, glaucoma therapy and in cosmetic preparations (Drinić, 2020), (Goločorbin-Kon et al., 2015).

The main goals of governments that have approved the legalisation of recreational cannabis are to prevent access to cannabis by young people, thereby protecting public health and reducing illicit activity. They argue that legalising cannabis would protect public health by establishing strict requirements for product safety and product quality, minimising contaminants and avoiding harm through high potency. They also argue that legalisation would facilitate prevention measures, making it easier for people who use drugs to talk about cannabis-related problems and seek support and treatment (International Narcotics Control Board - report, 2022). One of the main goals of all states that supported legalisation was to eliminate the illegal drug market and associated organised crime. However, in most countries, contrary to expectations, the illegal market persisted and even developed in parallel with the legal market. Despite the establishment of a regulated market, the demand for illegal supply persists, due to the youth who are under the legal age to purchase legal cannabis, adults who do not want to register and tourists who do not have access to a legal market. Additionally, people who use cannabis may choose to continue obtaining it from the illegal market due to lower prices, wider range and higher concentrations (International Narcotics Control Board - report, 2022). Sulić et al. devised a liquid chromatography-mass spectrometric (LC-MS) method to detect 11-nor-Δ9-tetrahydrocannabinol-9-carboxylic acid (THCA). The established method of detection for this important THC metabolite in urine provides a precise, accurate, reproducible, and dependable way to demonstrate cannabis abuse (Sulić et al., 2014).

Given the reasons mentioned above, it is necessary to develop appropriate strategies to combat the abuse of psychoactive substances among the population in the Republic of Serbia. This includes, among other things, regular education of the population about the harmfulness of PAS use, as well as aiding persons who have encountered addiction problems.

RESEARCH METHODS

To successfully combat PAS abuse, it is necessary to have the best possible insight into the consumption of psychoactive substances on the territory of a country.

An effective method is anonymous surveys, where people express their opinions about the use of PAS. Taking the above into account, this work is based on two independent studies. The first survey was conducted to obtain statistical data on the use of psychoactive substances and drugs with a psychoactive effect. The second survey was specifically aimed at obtaining the opinion of the population on the legalisation of one of the most abused drugs today, cannabis. It should be noted that prior to conducting the survey on the abuse of illegal PAS, we had conducted surveys on the collection, preparation and preservation of wild plants from their natural habitats. The findings of the previous survey informed our subsequent investigation about the attitudes of the Serbian population towards the use of legal plants for medicinal purposes (Jovanović et al., 2023). Therefore, the goals of this work are:

1) To gain insight into the use of psychoactive substances in the daily life of citizens in the Republic of Serbia;
2) To obtain the population's opinion on the use of cannabis for medical purposes;
3) To gather opinions on the legalisation of cannabis.

This research involved two separate samples to explore a range of opinions through questionnaires or surveys.

The first study was conducted through anonymous surveys across the Republic of Serbia between March and April 2023. The survey questions related to the use of both legal psychoactive substances,

such as caffeine, alcohol and nicotine, and illegal psychoactive substances. A total of 72 people took part in the survey, with respondents ranging in age from 18 to 68. Participants included students, employed individuals, unemployed individuals, and retirees.

The second survey was conducted in the period from August 2023 to May 2024 on the territory of the Republic of Serbia. Data were collected from a sample of 280 respondents through an anonymous questionnaire that contained general questions about age, sex, place of residence and level of education and closed-ended questions expressing the opinion of the population on the use of cannabis for medical purposes and the legalisation of cannabis.

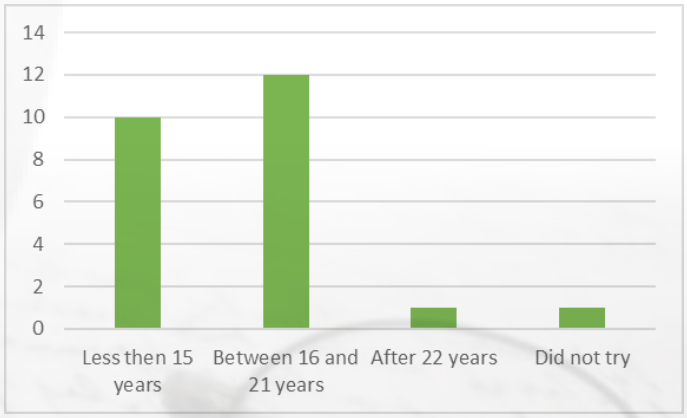
RESULTS AND DISCUSSION

First Survey Research

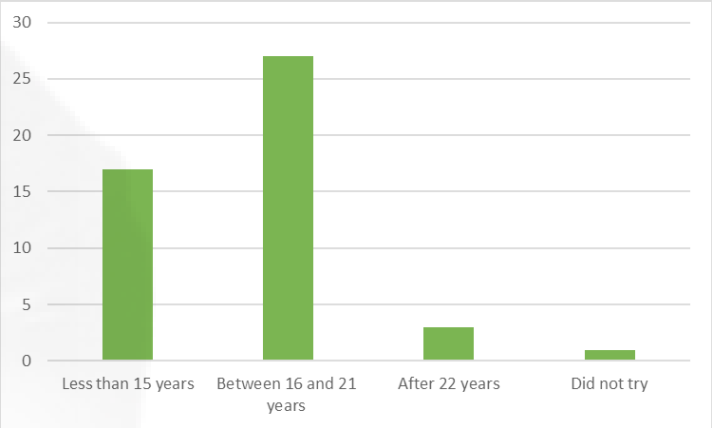
The first nine questions of the initial questionnaire focused on the use of legal psychoactive substances. The opening question, **"What is your gender?"** yielded responses from 48 female and 34 males.

The second question was, **"How old are you?"** The largest percentage (61.1 %, 44 people) of respondents fell between the ages of 21 and 34. 26.4 % of respondents (19 people) were over 45 years of age, 9.7 % (7 people) were from 35 to 44 years old, and 2 respondents (2.8 %) were under 21 years old.

The third question, **"When did you try alcohol for the first time?"** was answered by all 72 respondents. Two respondents, one female and one male, stated they had never tried alcoholic beverages. The largest percentage of respondents (54.2 %, 39 persons) tried alcohol for the first time between the ages of 16 and 21. 37.5 % of the respondents (27 people) declared trying alcohol before the age of 15, while 5.6 % of the respondents (4 people) said they first tried alcohol after the age of 22. The graphs below (Graphs 1-2) illustrate the gender distribution among those who tried alcohol for the first time.

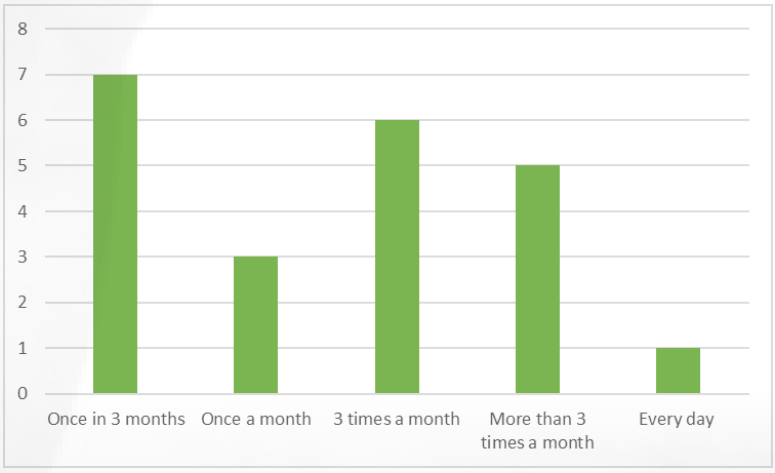


Graph 1. *The Age Distribution of Male Respondents When They First Tried Alcohol*



Graph 2. *The Age Distribution of Female Respondents When They First Tried Alcohol*

The fourth question, **"If you consume alcohol, how often do you do it?"** was answered by 68 respondents. The most common response was three times a month (26.5 %, 18 respondents). The other responses were as follows: more than 3 times a month (25 %, 17 respondents), once in 3 months (23.5 %, 16 respondents), once a month (20.6 %, 14 respondents), and three people (4.4 % of respondents) answered that they consume alcohol every day (Graphs 3-4).

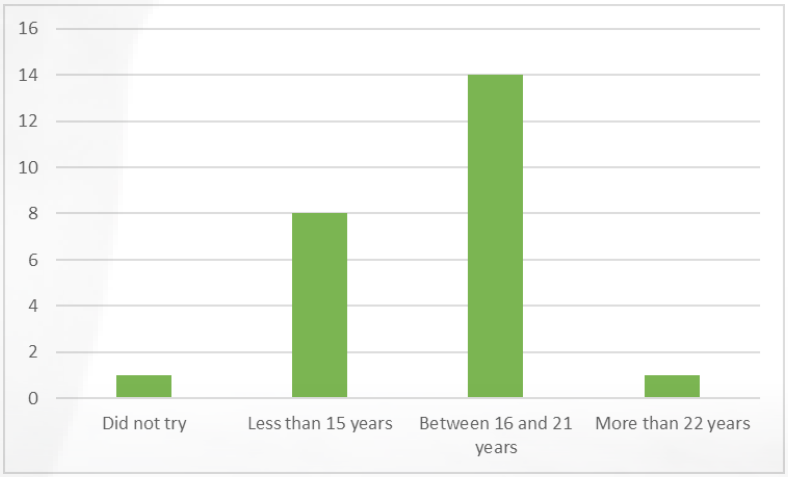


Graph 3. *Frequency of Alcohol Consumption Among Male Respondents*

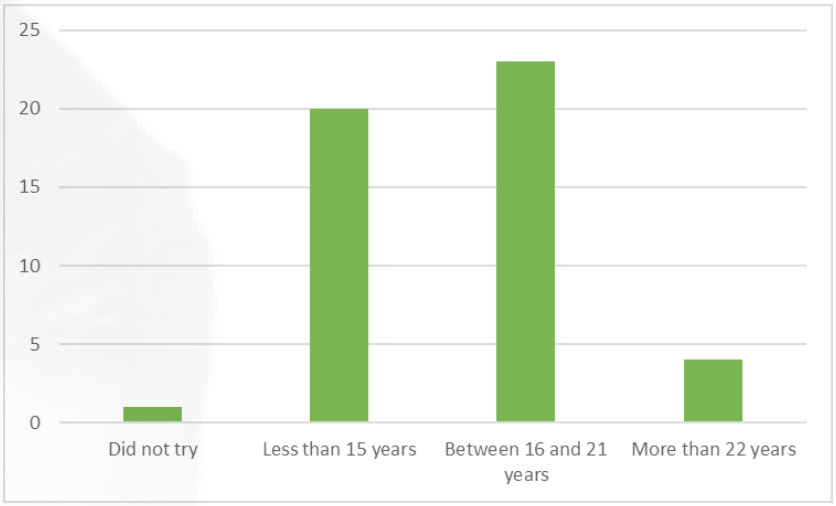


Graph 4. *Frequency of Alcohol Consumption Among Female Respondents*

The fifth question read, **"When did you try coffee for the first time?"** All 72 respondents answered. Two individuals, one male and one female, indicated that they had never tried coffee. Among those who did try coffee, 38.9 % (28 people) did so before the age of 15, 51.4 % (37 people) between the ages of 16 and 21, and only 6.9 % (5 people) tried coffee for the first time after the age of 22 (Graphs 5-6).

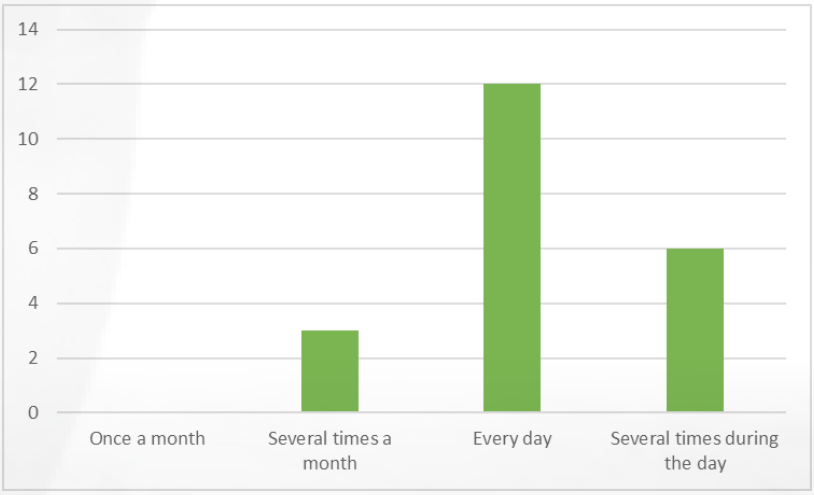


Graph 5. *The Age Distribution of Male Respondents at Their First Consumption of Coffee*

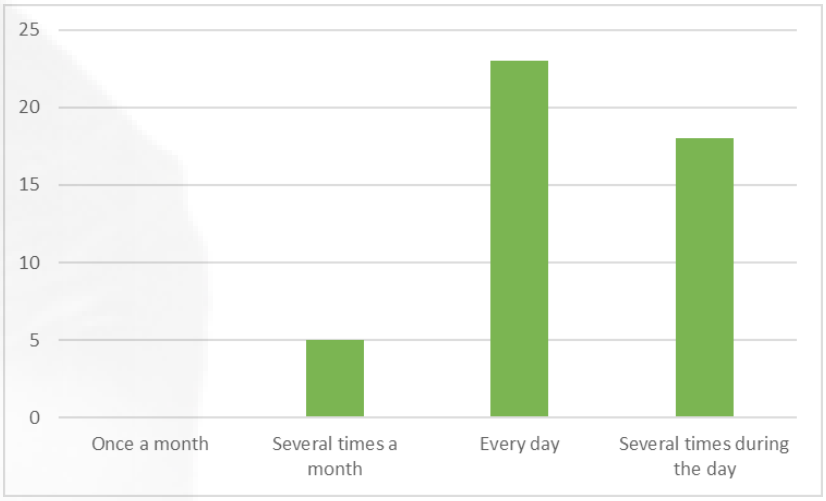


Graph 6. *The Age Distribution of Male Respondents at Their First Consumption of Coffee*

The sixth question, **"If you consume coffee, how often do you do it?"** was answered by 67 respondents. 52.2 % of respondents (35 people) answered that they consume coffee every day, 35.8 % of respondents (24 people) consume it several times a day and 11.9 % (8 people) more than once a month. No respondents reported consuming coffee once a month (Graphs 7-8).

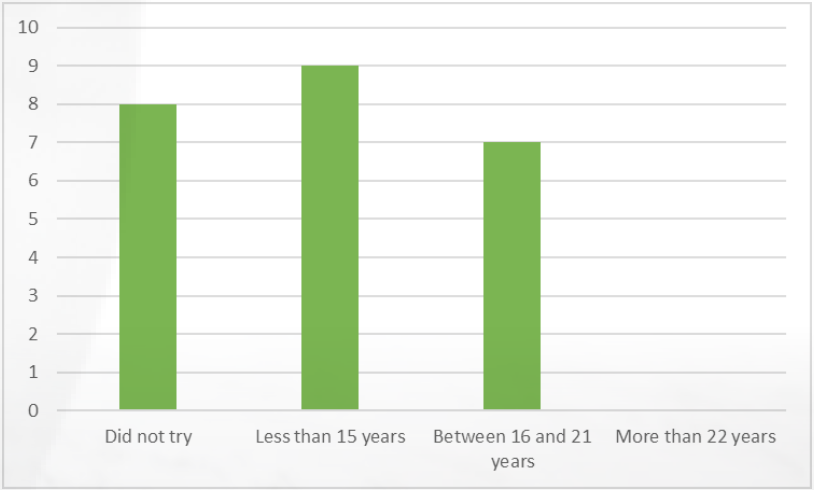


Graph 7. *The Frequency of Coffee Consumption Among Male Respondents*

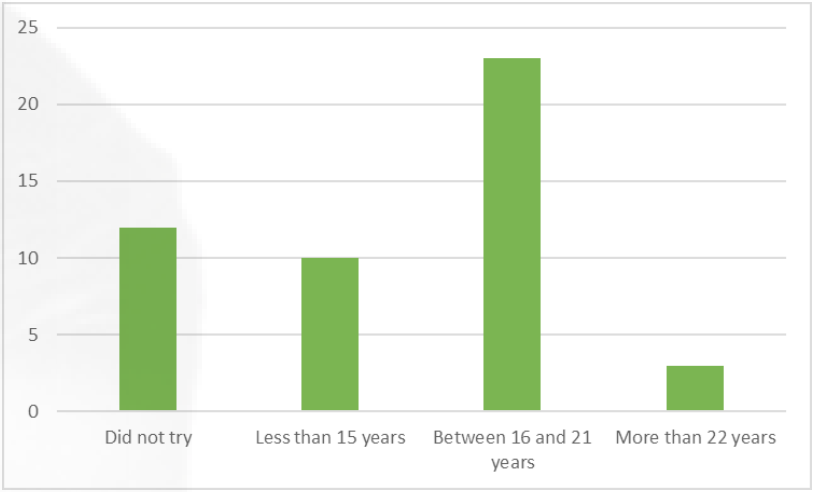


Graph 8. *The Frequency of Coffee Consumption Among Female Respondents*

The answer to the seventh question **"When did you try cigarettes for the first time?"** was provided by all respondents. The largest percentage of respondents tried cigarettes between the ages of 16 and 21 (41.7 %, 30 people). 26.4 respondents (19 people) tried cigarettes when they were under 15 years old, while 4.2 % of respondents (3 people) did so when they were over 22 years old. Twenty respondents (27.8 %) indicated that they have never tried cigarette (Graphs 9-10).



Graph 9. *The Age Distribution of Male Respondents When They First Tried Cigarettes*



Graph 10. *The Age Distribution When They First Tried Cigarettes*

The eighth question, **"If you consume cigarettes, how often do you do it?"** was answered by 31 respondents. The majority, constituting 64.5 % (20 people), reported being daily smokers. Additionally, 29 % (9 people) indicated using cigarettes on specific occasions, while 6.5 % (2 people) reported using cigarettes exclusively with alcohol.

To the ninth question **"If you are currently an active smoker, do you plan to quit smoking in the future?"** 25 respondents provided answers. The largest group, comprising 52 % (13 people), expressed intentions to quit smoking. Four respondents (16 %) stated they had attempted to quit in the past but were unsuccessful, while 32 % (8 people) indicated they do not plan to quit smoking.

The following five questions were about drug abuse:

The tenth question, **"Have you ever used substances with a psychoactive effect for reasons other than medical?"** was answered by all 72 respondents. Of these, 23.6 % (17 people) answered affirmatively, while 76.4 % (55 people) answered negatively.

The following eleventh question, **"Have you ever abused drugs?"** resulted in 4.2 % (3 people) of the 72 respondents who answered yes, while the remaining 95.8 % (69 people) answered no.

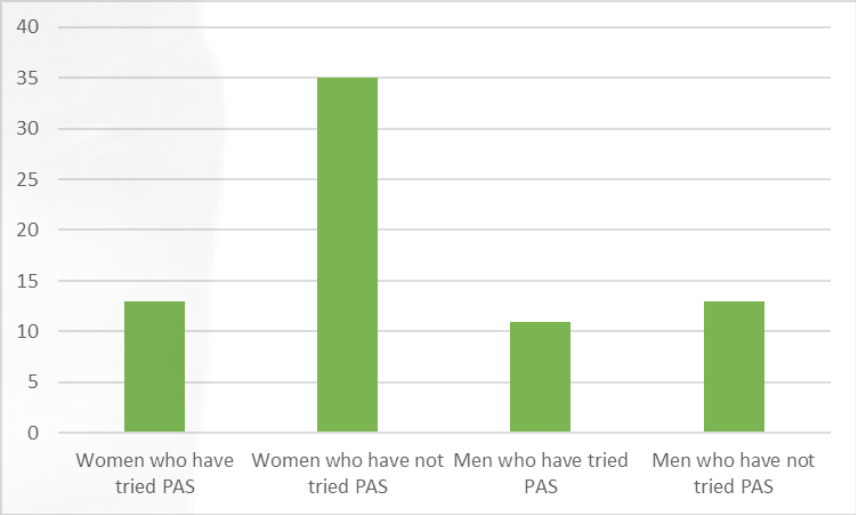
The twelfth question targeted those who answered yes to the previous question and asked **"Which drugs do you abuse?"** Their responses included bromazepam/lorazepam (50 %, 2 people), Rivotril (25 %, 1 person), and other mentions such as Bensedin and Ritalin.

The thirteenth question reading **"Do you consume several medications at the same time?"** was answered by 72 respondents. 83.3 % of respondents (60 people) denied, while 16.7 % of respondents (12 people) gave an affirmative answer.

Regarding the fourteenth question **"Do you consume medicines with alcohol (at the same time)?"** All 72 respondents provided answers. A majority of 97.2 % (70 people) answered no, while 2.8 % (2 people), both women, answered yes.

The subsequent questions focused on the use of illegal psychoactive substances:

The fifteenth question, **"Have you ever tried any illegal psychoactive substance?"** was answered by 72 respondents, with 33.3 % (24 people) responding yes, and 66.7 % (48 people) responding no. Specifically, among women, 13 answered yes, and 35 answered no, while among men, 11 answered yes, and 13 answered no (Graph 11).

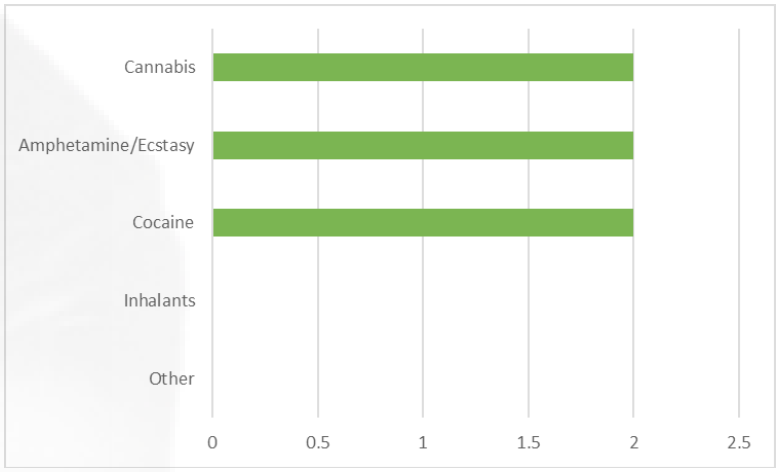


Graph 11. *Responses of Male and Female Respondents Regarding Their Use of Psychoactive Substances*

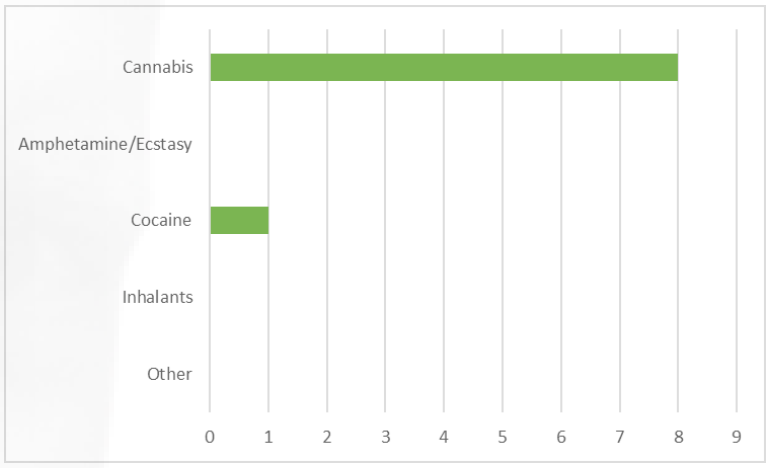
The answer to the sixteenth question **"If the answer to the previous question was YES, how often you consume illegal psychoactive substances?"** was given by 23 respondents. The highest percentage of answers was that they only tried it once (60.9 %, 14 people), then 26.1 % of respondents (6 people) answered that they use PAS once every few months and 8.7 % of respondents (2 persons) more than once a month, once a month 4.3 % of respondents (1 person), while none of the respondents stated that they use PAS daily.

The answer to the next, seventeenth question that read **"If you are a consumer of illegal psychoactive substances, when do you use them?"** was given by 14 respondents. Half of the respondents, 7 people, answered that they use PAS exclusively in society, even at home. 28.6 % of the respondents (4 people) said that they use PAS only when they go out, while 21.4 % (3 people) answered that they do not need any reason to consume PAS.

The answer to the eighteenth question **"If you are a consumer, which illegal psychoactive substances do you use?"** was given by 15 respondents. The highest percentage of answers was cannabis (66.7 %, 10 people), followed by cocaine (20 %, 3 people) and the smallest number of answers was amphetamines/ecstasy (13.3 %, 2 people). In addition to the previously mentioned, the offered answers were inhalants and others, which none of the respondents chose (Graphs 12-13).



Graph 12. *Responses from Male Respondents Regarding Which Illegal PAS They Use*



Graph 13. *Responses from Female Respondents Regarding Which Illegal PAS They Use*

The nineteenth question asking **"If you are a regular consumer, can you last a whole week without illegal PAS?"** was answered affirmatively by all 8 respondents.

The twentieth question queried, **"As a consumer, are you always able to stop using psychoactive substances when you want to?"** 12 respondents answered "Yes".

The twenty-first question was, **"Did you have blackouts or flashbacks as a result of PAS consumption?"** The answer was given by 19 respondents. 15 respondents (78.9 %) answered in the affirmative, while 4 respondents (21.1 %) answered "No".

The answer to the twenty-second question **"Did you have psychological discomfort due to consumption (nervousness, depressive thoughts, and suicidal ideas)?"** was given by 18 respondents. "Yes" was answered by 5 respondents (27.8 %), while "No" was given by 13 respondents (72.2 %).

Seventeen respondents answered to the twenty-third question, **"Did you experience physical discomfort due to consumption (bone and muscle pain, runny nose, sneezing, coughing (flu symptoms))?"** Fourteen respondents (82.4 %) answered "No" and 3 respondents (17.6 %) answered "Yes.".

The twenty-fourth question was, **"Do you currently consume any illegal PAS?"** Out of 43 responses, 42 respondents (97.7 %) answered "No" and one respondent (2.3%), a female, answered "Yes".

The twenty-fifth question **"When was the last time you consumed PAS?"** including options - the previous day, on the weekend, or other – was answered by all 16 respondents who chose the option "other".

The twenty-sixth question **"How do you use illegal PAS?"** was answered by 14 respondents. The highest percentage of answers (64.3 %, 9 people) was "inhalation (by smoking)", then the same percentage of respondents (14.3 %, 2 people each) answered "via tablets (orally)" and "powder (by sniffing)". One person (7.1 %) chose "dissolving in drink" as the answer.

The answer to the twenty-seventh question "**Do you mix PAS with alcohol during consumption?"** was given by 21 respondents. Of these, 17 people answered "No" (81 %), while 4 respondents (19 %) answered "Yes".

The twenty-eighth question was directed at respondents who answered "yes" to the previous question and it was **"How often do you mix psychoactive substances with alcohol during consumption?"** Three respondents (75 %) indicated "Occasionally", while one respondent (25 %) chose "Always".

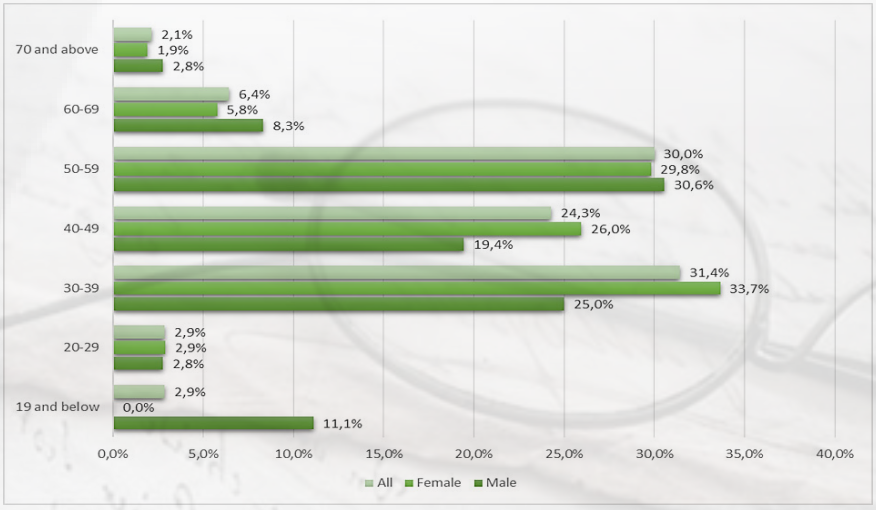
The twenty-ninth question **"Do you consume several psychoactive substances at the same time (e.g. cocaine and marijuana)?"** was answered by eighteen respondents, with 16 of them (88.9 %) selecting "No", and the remaining 2 respondents (11.1 %) choosing "Yes".

The thirtieth question was, **"Do you use PAS simultaneously with medicines?"** All 18 respondents answered in the negative.

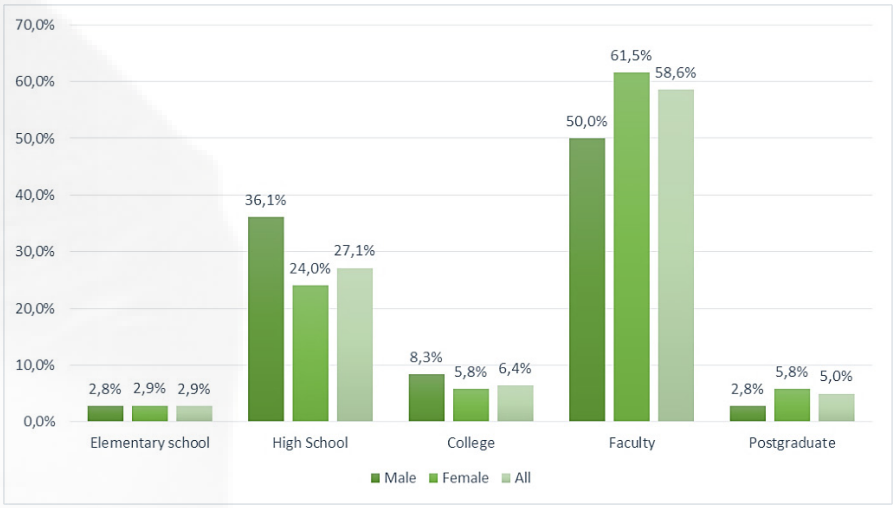
The final thirty-first question was, **"Can you easily get a psychoactive substance?"** Thirty respondents answered to this question, with 20 respondents (66.7%) answering affirmatively, and 10 respondents (33.3%) answering "No".

SECOND SURVEY RESEARCH

280 respondents from Serbia participated in the conducted research. Among them, 74.29 % (208) were women and 25.71 % (72) were men. Regarding the place of residence, 24.29 % live in rural areas, while 75.71 % are urban residents. In terms of age, the majority of respondents fall into the 30-39 age group, comprising 31.4 % of the total respondents. The least represented age group is those aged 70 and over, accounting for 2.1 % (**Graph 14**).

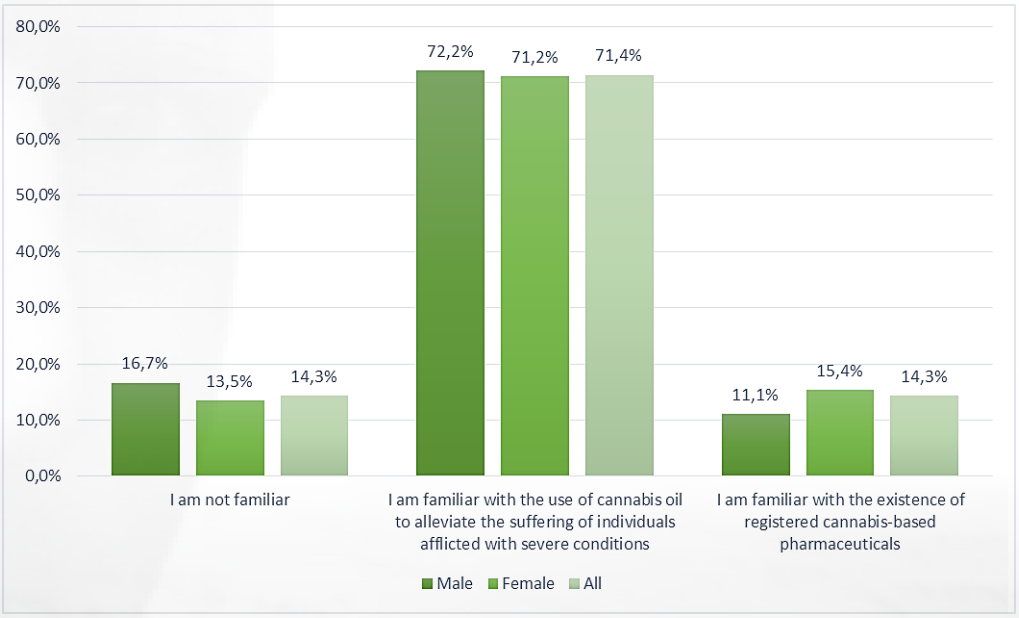


Graph 14. *Age Structure of Respondents*



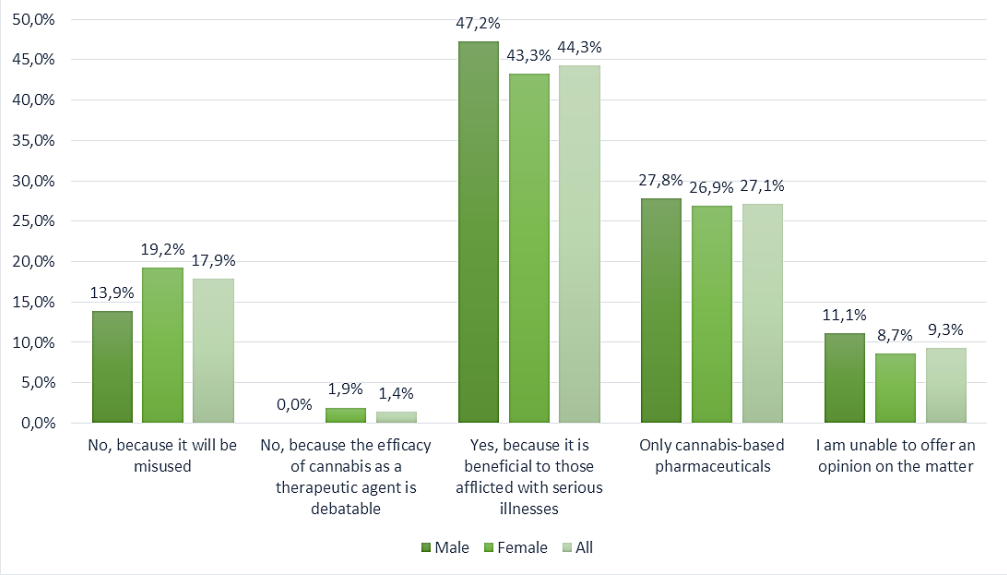
Graph 15. *Structure of Respondents According to Education*

As can be seen from **Graph 15**, most respondents are with higher education, 63.6 % (total number of individuals holding either a faculty degree or a postgraduate qualification).



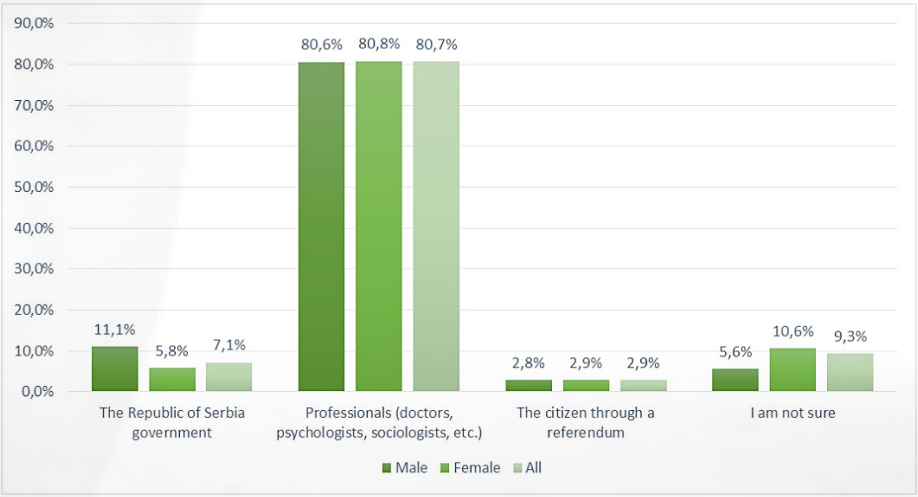
Graph 16. *Respondents' Familiarity With the Use of Cannabis for Medical Purposes*

As it is clear from **Graph 16**, respondents are familiar with the use of cannabis oil to ease the pain caused by serious illnesses. However, only a very small number of respondents are aware of the existence of registered medicines.



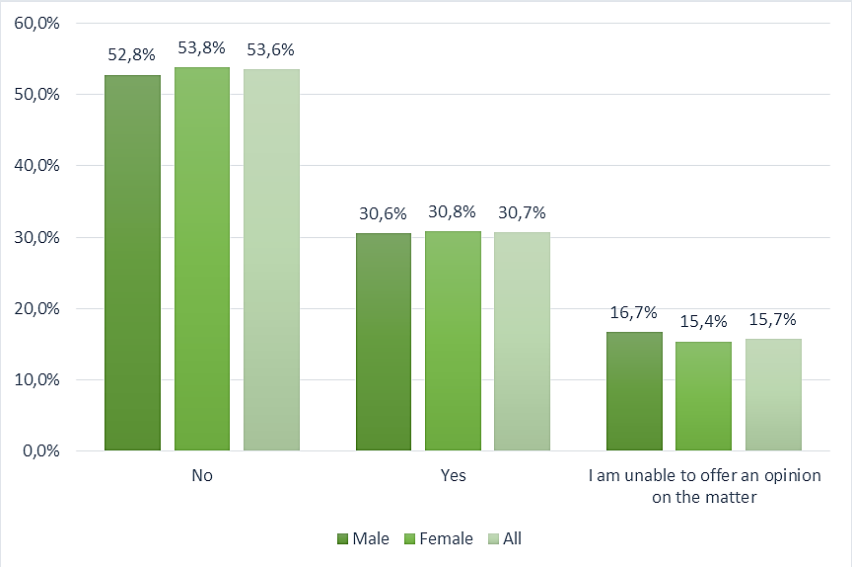
Graph 17. *Respondents' Views on the Legalisation of Cannabis for Medical Purposes*

From the **Graph 17,** it is obvious that the majority of respondents answered affirmatively to the question: **"Should we legalise cannabis for medical purposes?"** However, 17.9 % of respondents expressed concerns about potential misuse.



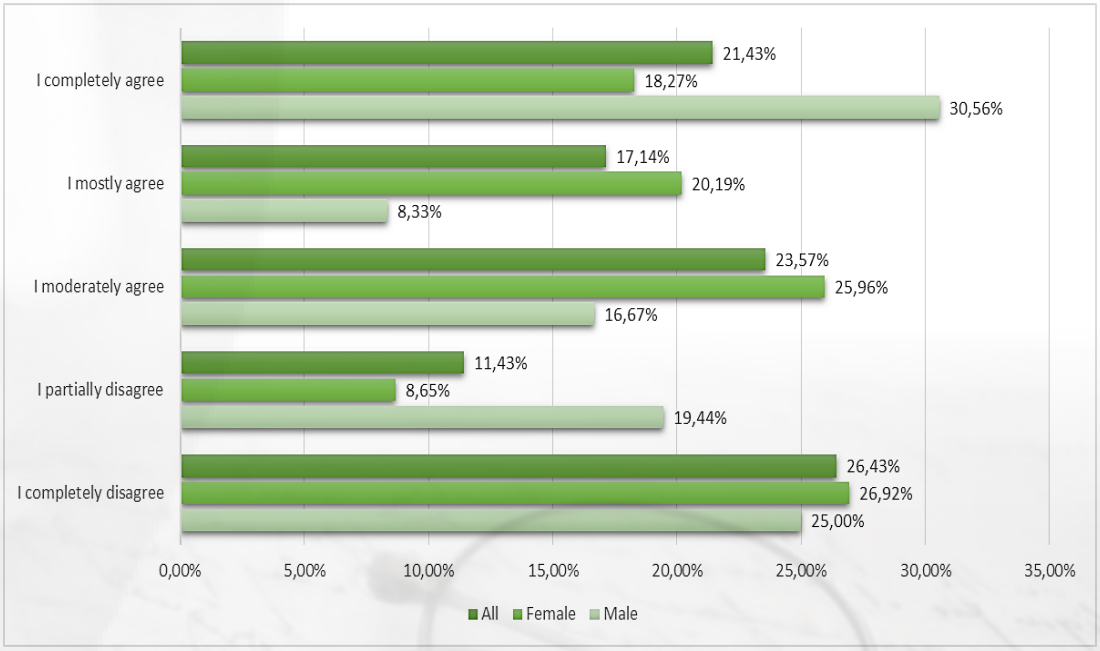
Graph 18. *Opinions of Respondents Who Should Make the Decision on the Legalisation of Cannabis for Medical Purposes*

Graph 18 provides insights into the responses to the question: **"Who should decide on the legalisation of cannabis for medical purposes?"** 80.7 % of respondents believe the decision should be made by experts, while 9.3 % are uncertain about whose competence it falls under.



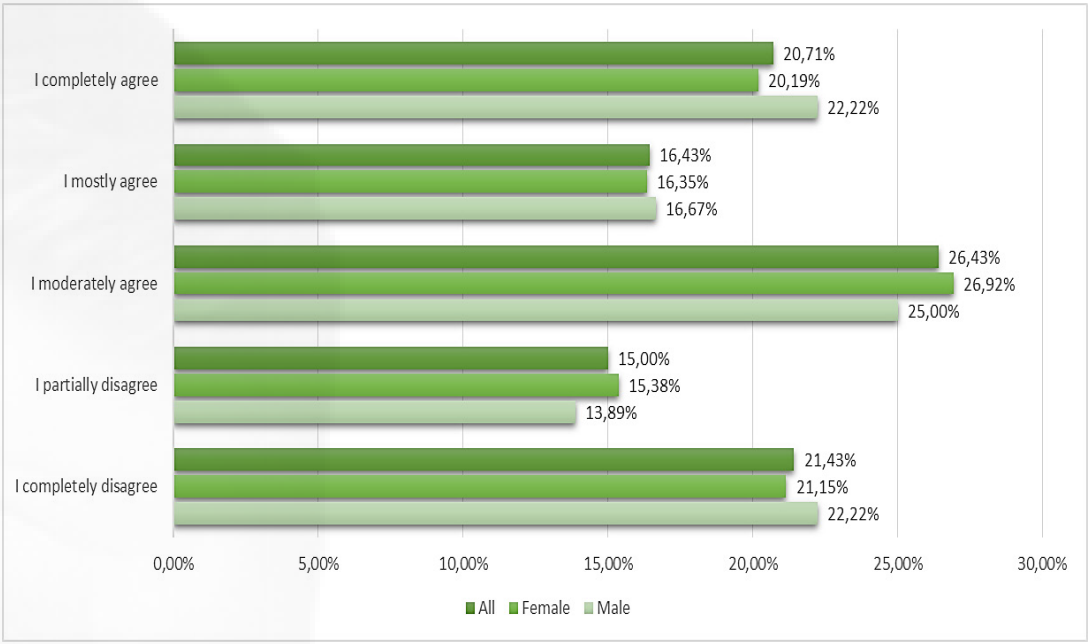
Graph 19. *Respondents' Views on the Legalisation of Cannabis for Recreational Purposes*

Graph 19 displays the responses to the question: **"Do you think that Serbia needs a law on the legalisation of cannabis for recreational purposes following the example of Germany (25 g is allowed for personal use)?"** 53.6 % of respondents answered no, 30.7 % answered yes, while 15.7 % had no opinion.



Graph 20. *Respondents' Agreement With the Statement Legalising Cannabis Regulates the Market That Already Exists, Which Would Reduce Abuse*

From **Graph 20** it can be seen that slightly more than a quarter of respondents (26.43 %) believe that the legalisation of cannabis would not regulate the existing market and would not reduce the scope for abuse. Among female respondents, 25.96 % are moderately undecided on the statement, while male respondents mostly agree with it (30.56 %).



Graph 21. *Respondents' Agreement With the Statement Cannabis Legalisation Would Bring More Good Than Bad*

According to the results presented in **Graph 21**, approximately a fifth of respondents (21.43 %) believe that the legalisation of cannabis would not bring much good, while 20.71 % think that the legalisation would bring benefits. A larger number of men believe that the legalisation would have advantages, whereas a larger number of women believe it would not.

DISCUSSION

As can be seen from the results of the first survey, the first consumption of alcohol and coffee is between the ages of 16 and 21, with men more likely to consume alcohol more often, while women are more likely to consume coffee daily. When it comes to cigarettes, most respondents tried cigarettes for the first time also between the ages of 16 and 21 and a large number of active smokers consume them daily. Furthermore, considering drugs with a psychoactive effect, only 4.2 % (3 people) of the respondents admitted abusing drugs. The most commonly abused drugs among respondents were bromazepam/lorazepam (50 %) and Rivotril (25%), with one person stating "other", including Bensedin and Ritalin. 16.7 % (12 people) of the respondents consume more than one drug at the same time, while only 2.8 % (2 people) of the respondents answered that they used drugs with alcohol and both were female.

When considering the results of the survey on the consumption of illegal PAS, a significant number of respondents admitted having tried some illegal PAS, out of 72 respondents, 24 (33.3 %) admitted having tried an illegal substance. Out of 13 women, 4 (30.8%) admitted using it, while out of 35 men, 20 (57.1 %) gave an affirmative answer, but a smaller percentage is a regular consumer, i.e. (8.7 %) of respondents consumes illegal PAS once a month. Most of the respondents (66.7 %) stated the use of cannabis, while a smaller number admitted the use of cocaine (20 %) or amphetamine/ecstasy (13.3 %). According to the respondents, obtaining PAS is not too much of a problem, so the majority of respondents (66.7 %) stated that they could easily obtain psychoactive substances if they wanted to.

Based on the data of the second research, the conclusions were drawn from the analysis of demographic characteristics, educational levels and respondents' attitudes about the use and legalisation of cannabis in different contexts. Namely, the respondents are mostly female (74.29 %) and largely aged between 30 and 39. The urban population predominates in the survey (75.71 %). Most respondents have a higher education (63.6 %), which indicates the presence of an educated part of the professional community in the research.

When talking about the use of cannabis oil as a therapeutic agent, the majority of respondents are familiar with its use in alleviating the suffering caused by serious diseases and support the legalisation of cannabis for medical purposes. However, when taking into account the views on the recreational use of cannabis, although the majority of respondents do not support the legalisation of cannabis for recreational purposes, there is a significant number of respondents who are in favour of it (30.7 %). When it comes to regulating the market and preventing abuse, there is scepticism about the possibility that cannabis legalisation will effectively regulate the market and reduce the scope for abuse. About a quarter of the respondents do not believe in the stated claim.

CONCLUSION

This study discusses several key issues related to psychoactive substances, focusing primarily on cannabis: its prevalence, patterns of use, and regulatory challenges. Psychoactive substances are widely used, with cannabis being the most commonly abused substance, as indicated by the results of our survey conducted in the territory of the Republic of Serbia. Cannabis use spans different demographic groups, including a worrying trend of younger people initiating use. There is growing concern about the health consequences of psychoactive substance abuse, particularly cannabis. Chronic use of cannabis, especially due to its high THC content, is associated with mental disorders.

The legal status of cannabis and cannabis-based products varies worldwide, affecting their availability and regulation. The majority of respondents (82.1 %) in our survey support the legalisation of cannabis for medical purposes in the Republic of Serbia. This indicates widespread acceptance of the idea that cannabis can be useful in alleviating the symptoms of serious illnesses. When it comes to the legalisation of cannabis for recreational purposes, fewer than half of respondents (30.7 %) in this survey support such a step, while the majority (53.6 %) are against it. This indicates a more cautious attitude towards legalisation for recreational use. Assessing the benefits and harms of legalisation, respondents are divided on whether the legalisation of cannabis would bring more good than bad. About a fifth of respondents (21.43 %) believe that legalisation would not bring many benefits, while a similar number (20.71 %) believe that it would bring benefits. While some countries have legalised cannabis for medical purposes, legalisation for recreational use aims to reduce illicit markets and associated criminal activity, although challenges remain in achieving these goals. There are significant regulatory challenges in standardising cannabis products due to variations in potency and composition. Regulatory agencies such as the FDA and EMA play a critical role in evaluating and approving medical cannabis products, but differences in national regulations complicate their distribution.

Effective strategies are needed to combat the misuse of psychoactive substances, including public education campaigns and support systems for addiction treatment. Understanding patterns of psychoactive substance use through surveys and research like this is essential for developing targeted interventions.

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THE IMPORTANCE OF FORENSIC AUDITING TECHNIQUES AND INSTRUMENTS IN COMBATING CRIMINAL ACTS

Dragan Cvetković, PhD[1]
Snežana Moretić-Mićić, PhD
Slađana Vujičić, PhD
Faculty of Business Economics and Entrepreneurship, Belgrade, Serbia

INTRODUCTION

Numerous corporate crimes and financial scandals in the late 20th and early 21st century, accompanied by significant losses, pointed to serious deficiencies and ambiguities in traditional accounting and auditing practices, highlighting the need for experts who can recognize, detect and investigate complex schemes of criminal activities in financial statements. Therefore, the importance of a more detailed perception at the role of forensic audit in the context of detection and prevention of criminal acts is increasingly highlighted. Efforts to detect and prevent criminal acts, especially in financial reports, have influenced the development of forensic auditing. As a primary need that is imposed before the forensic audit is to study the nature, categories, forms and patterns of criminal acts as well as warning signs of ”red flags” because this is a prerequisite for their prevention and detection.

Criminal acts, as socially negative phenomena, represent a serious problem in all countries today, causing not only financial losses to the company, the state, but also the loss of their reputation in the public. In this sense, the methods and techniques applied by forensic auditors can be useful instruments in combating criminal activities, as they enable criminal auditors to find and document deficiencies, manipulations and omissions in financial statements and accounting as a whole.

The role of forensic audit, as a new specialized service of the auditing profession, in the social context and according to its importance can be seen through pointing out the possibility of occurrence, the resulting criminal act or the prevention of the possibility of the occurrence of criminal acts in connection with financial statements and their importance. Misrepresented data in financial reports is not always the result of ignorance, oversight or incorrect application of international accounting standards, but also criminal actions for the purpose of obtaining personal profit.

In order to prevent the further increase of criminal acts, especially their sophisticated form, false financial reporting, the posibility to discover the manner in which they were committed, as well as the identification of the perpetrators, is extremely important. One of the key roles in the audit of criminal acts is the application of modern forensic instruments with the help of computers. The development of analytical procedures and models as an audit tool is also very important considering the scope of audit engagement and the growing demands of today’s business environment.

This paper opens the issues of a new field of activity of the auditing profession and a new practical challenge for this profession - the detection of criminal acts. The growing problem of criminal acts,

1 dragan.cvetkovic@vspep.edu.rs

expressed in the form of corruption, embezzlement and false financial reporting, points out the need of countries around the world to reduce or neutralize the scope of these socially negative phenomena.

PURPOSE

Today's entrepreneurial activity generates sustainable economic growth and a better standard of living (Janošik et al, 2023). Today in modern business, the frequency of criminal acts and the appearance of new forms is an extremely serious problem not only for the owners and top management of companies, investors and other interested parties, but also for the accounting and auditing profession, which must design and develop methods, procedures for the investigation of criminal acts that are primarily reflected in the company's financial statements. Using the power of data analytics, organizations can derive actionable insights to optimize resource allocation, mitigate risks (Pantović et al, 2024) and introduced financial controls. In this context, practice has given birth to forensic auditing as a new service within the audit profession. It is a specialized activity of auditing financial statements, the primary objective of which is the prevention, detection and investigation of criminal acts in financial statements.

Essentially, criminal actions in/with financial reports represent intentional actions aimed at illegal appropriation of property and money, falsification of accounting documents, presentation of non-existent transactions, changes to documents and records, etc. The work of the forensic auditor is important for detecting irregularities in the information presented in the financial reports, i.e. for the investigation of fraud and the detection of perpetrators of those criminal acts. Forensic auditors use various analyses and methods as well as computer-equipped techniques in order to effectively identify criminal activity and detect fraudulent financial statements.

After the introduction, in the first part of the paper, the focus is on the definition and typology of criminal acts. False financial reporting, which is the result of manipulative accounting, is the subject of consideration in the second part of the paper, which examines criminal schemes and "red flags" that indicate possible criminal activity in financial reports and accounting. The problem of detection and prevention of criminal acts is dealt with in the third part, in which the concept of forensic audit is determined and the objectives are explained, as well as the characteristics of the audit profession subject are described. The fourth part of the work deals with the consideration of the forensic audit methodology, that is, the procedures related to the audit process. Also, the subject of this part of the work are tools and techniques with the help of computers that are used in the detection and prevention of criminal acts. This is followed by a conclusion that emphasizes the importance of forensic audit in detecting criminal acts in financial reports and clearly indicates the perspective of applying forensic audit in suppressing a wide range of criminal acts. Finally, the used references are written down.

DESIGN/APPROACH

Definition and Typology of Criminal Acts

From the point of view of researching criminal acts, special significance for their understanding has the definition of their categorization. There are no definitive and unchanging rules for defining the term of criminal action. The criminal action essentially involves various ways of fraud that human mind can devise, which individuals use to take advantage over other persons with false claims. Crimi-

nal actions include a wide range of phenomena characterized by deliberate deception or misrepresentation, and aims to achieve an illegal benefit for an individual or organization, with the fraudster who can be outside or within the organization. As synonyms, the terms are often used: ”fraud, i.e. the fraud actions”, ”criminal offenses”, ”illegal activities”, ”malversations”, ”manipulation”, ”deception”, etc. In the accounting literature, the fraud is also known as ”white collar crime”, embezzlement and irregularity (Knežević, Mitrović & Cvetković, 2019: 102).

In a modern sense, criminal acts include dishonesty in the form of deliberate deception or deliberate misrepresentation of material facts (Singleton et al., 2010:12). International audit standards define criminal activity as ”an intentional act, performed by one or more persons, who are responsible for management, employees, or third parties, who are involved in a secret agreement, to obtain an unfair, illegal advantage” (MSSR, 2004: 220). These criminal acts represent extremely socially dangerous behaviour of individuals and groups, that is, legal entities, companies, institutions or other organizations, because in this case, the violation of regulations directly or indirectly endangers the financial interests of the entire social community. This again entails causing great damage to the fiscal system and the public revenue system in general (Knežević, Cvetković, et al., 2021).

In a general sense, a criminal act is the deliberate manipulation of the truth for financial, material or personal gain. It is widespread in many parts of the world and exists even in those areas where people are generally considered to maintain high ethical standards. Every company, organization can be affected by a criminal or fraudulent act, with the possibility of losing property and reputation as a result of improper actions of its own employees and external persons. There is no society, enterprise, company and organization that is completely immune to criminal acts and that has eradicated them. Every form of criminal activity violates or endangers certain social values. All these values are manifested through adequate social relations. It is characteristic of every type of delictual, especially criminal, behaviour that it attacks, and by not sanctioning it, damages certain social relations, and within them certain activities, processes and values (Milošević & Cvetković, 2012).

Although there are several ways and categorization of criminal acts, the following basic groups are often mentioned in the literature according to (Cvetković & Kešetović, 2018):

- perpetrators of criminal actions;
- regulations of criminal legislation;
- accounting cycles;
- forms and execution methods of criminal actions.

Criminal actions according to perpetrators - When it comes to criminal actions and their perpetrators, they can include (Albrecht et al., 2012:10):

1) Those in which the organization is a victim of fraud:
   - fraud committed by employees where the perpetrator is an employee of the organization;
   - fraud committed by sellers - the perpetrator is the company's supplier;
   - fraud committed by customers – the perpetrator is the customer of the company.
2) Management fraud where the victims are shareholders or creditors of the company
3) Various types of frauds in investments and stocks, as well as various frauds with consumers where the victims are usually unwary individuals
4) Other frauds

Criminal actions according to the regulations of the criminal legislation (Cvetković & Kešetović, 2018) - Since the legal regulations are of a variable nature and can differ in the severity of sanctions in the

form of misdemeanors, economic offenses or criminal acts, for the theory and practice of examining criminal actions in financial reports, it is necessary to know the criminal legislation of the country of residence. In the Criminal Code of the Republic of Serbia (Official Gazette of RS, 2019) there is a large number of criminal offenses, including criminal offenses related to the economic and financial area (unwarranted loan approval and other benefits; fraud in the economic activity performance; tax evasion; malpractice of a person-in-charge; money laundering; falsification of official documents; misuse of official incumbency, service frauds etc.). Apart from the mentioned criminal acts, others can have a materially significant impact on the business operations of companies and their financial statements (taking bribes, giving bribes, etc.). Various forms of criminal acts are present and can occur in all activities, both in the private and public sectors. In addition to the Criminal Code of the RS, the field of business operations is also regulated by other laws that regulate business in general, as well as by laws that regulate specific fields of business (construction, energy, agriculture, etc.).

Criminal actions according to accounting cycles (Cvetković & Kešetović, 2018) - This division of criminal actions in financial reports has been made according to the accounting cycles, so criminal actions can be classified into the following cycles:

- sales and billing;
- purchases and payments;
- payrolls and personnel;
- warehouses and stock;
- capital asset acquisition.

As the person, who investigates the origin of a criminal action, is able to carry out the procedures for its detection and prevention, he must, besides possessing accounting and other professional skills and knowledge, have a good knowledge of the forms and execution methods of criminal actions. The importance of knowing the forms and execution methods of certain criminal acts, for their successful prevention and detection in financial reports, is obvious. Accordingly, international auditing standards list the following as the main forms of criminal activity in financial statements:

- financial statement fraud;
- fund misappropriation.

However, the Association of Certified Fraud Examiners (ACFE) in addition to these two main types of criminal acts, includes the third one, corruption, ”in which the fraudsters wrongfully use their influence in business transactions in order to procure some benefit for themselves or another person, contrary to their duty to their employer or the rights of another” (Wells, 2005:41). Namely,the research conducted by ACFE shows in a significant number that companies in countries worldwide and the world economy, as well, face three forms of criminal actions, that is, fraud (ACFE, 2024:4):

- corruption;
- asset misappropriation and
- financial statement fraud.

The classification given by the ACFE has a characteristic form better known as the ”fraud tree” (ACFE, 2024:11). Within each of the mentioned categories there are special subcategories. Thus, within the framework of corruption, the following are identified: bribery, conflict of interest, illegal gratuities and economic blackmail. With asset misappropriation, there are many different forms of fraud that fall into this category. A common feature is the theft of cash or other property from the company, and practice has shown that illegal appropriation appears mostly as: theft of cash, fraudulent payments,

fraud with supplies, equipment, inventory, fraud with the sale of goods, misuse of property. All the aforementioned categories and forms of criminal acts are subject to investigation by various forms of control (internal and external audit, forensic accounting, state tax authorities, etc.) and each type of criminal activity has its own significance and the damage it causes. However, in this paper, greater attention will be focused on criminal acts in financial reports, that is, on the falsification of financial reports, as a special form of criminal activity that is the subject of a forensic audit investigation.

Financial Statement Fraud: Schemes and "Red Flags"

Financial statement fraud is defined as "deliberate misrepresentation or omission of certain data or disclosures in financial reports with the aim of deceiving the users of financial reports", (MSSR, 2005: 277) while fund or asset misappropriation refers to the appropriation of funds of a legal entity which is often accompanied by redacted, as well as false records in order to hide property that has been appropriated or to use it without adequate authorization (MSSR, 2005: 278). The American Institute of Certified Public Accountants (AICPA) defines financial statement fraud as "deliberate inaccuracies or omissions of amounts or disclosures in financial statements, in order to mislead users of financial statements" (Dimitrijević, 2015: 139).

According to the ACFE, of the three listed categories of professional fraud (Figure 1), the rarest criminal acts refer to those in financial statements, (5% of the cases in their study), in which the perpetrator intentionally has caused a false statement or omission of certain data in the company's financial statements, with the greatest financial losses ($766,000 per case) (ACFE, 2024:10). It is therefore the rarest form of criminal activity/fraud, which is also the most harmful. According to this research, as many as 12% of fraudsters are employed in the accounting sector (ACFE, 2024:5). Precise data on the amount of loss and frequency is difficult to determine, because many frauds are not identified or detected. Financial statement fraud is always a criminal act, while every criminal activity does not have to be related to falsifying financial statements, because there are criminal acts without a trace in the accounting documentation.

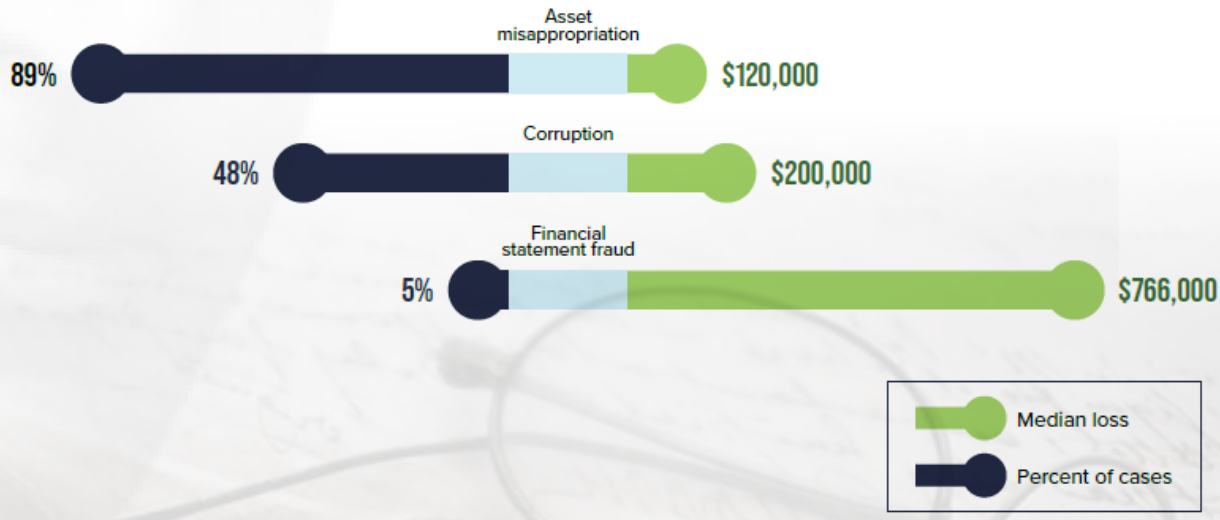


Figure 1. *How Is Occupational Fraud Committed? (ACFE, 2024:10)*

According to the ACFE model (ACFE, 2024:11), there are two subcategories of schemes related to financial statements: financial (high frequency) and non-financial (low frequency). Due to the number

of frequencies, it is more necessary to clarify the financial subcategory. This subcategory can have five schemes or techniques of financial statement fraud (Singleton, 2010: 120):

1) **Timing differences (improper recognition treatment)** - ways to form schemes for this method and aggrandize revenue are as follows:
   - The method of filling the sales channel - if there is an excess of goods, it is shipped and then the stock is treated as sold (regardless of the fact that the goods will be returned in the following period is known in advance).
   - Surplus stock is directed to the persons who are sellers .
   - Premature revenue recognition - in the case of a multi-year contract, the entire revenue is recognized immediately to the detriment of the financial conditions in future years. At the same time, there is non-compliance with generally accepted accounting and other principles.
2) **Fictitious revenues** - this scheme implies the recording of sales that has never occurred and therefore revenue that may include a real or fictitious customer. As a result, an increased revenue, i.e. profit and assets, is achieved. The most common criminal activities of these schemes have been used in insurance companies and on that occasion it has created fictitious insurance policies in large numbers and for large amounts.
3) **Concealed liabilities (improper recording of liabilities**) - in this scheme, it is indicated that the recording of liabilities is delayed. In this way, the current year is shown with fewer expenses, while the resulting obligation is recorded in the first month of the following year. That's why there are frequent checks of time allocation and control over the review of invoices that bear the date of the year for which the audit is performed, and which are posted in the first month of the following year; then checking whether the company has transferred the resulting obligations to subsidiaries that are not audited or are being audited by another audit firm in order to cover up a criminal act. This scheme is often resorted to by companies that have their branches all over the world.
4) **Improper disclosures** - if the board of directors conceals its connection with special purpose entities or under the pretext of "accidentally" failing to disclose some obligations, criminal acts committed by management can be concealed.
5) **Improper asset valuation** - by increasing the amount of assets (mainly through receivables, inventory and long-term assets), capitalizing costs or reducing some accounts (adjustment for doubtful and disputed receivables, depreciation, amortization, etc.) financial data shows greater equity and profit than actual (Singleton, 2010: 123). If they treat an expense as an asset, the profit and loss account suddenly seems much better (Eremić Đođić, 2017:232-234).

The objective of all forms of financial statement fraud is to misrepresent the the company's financial and profitability position in order to deceive users of financial statements and obtain benefits for the company at the expense of investors, creditors and other users of financial statements. In other words, criminal activity in financial statements is aimed at financial acquisition, concealment and asset misappropriation or gratification of interested parties in various circumstances.

Detecting criminal acts in financial reports and accounting requires special professional knowledge and experience, and forensic accountants/auditors deal with the investigation of such anomalies in business reporting. Therefore the one who investigates their origin should be able to carry out the procedures for their detection, but also to carry out the phases of their prevention, he/she must be familiar with the forms, criminal schemes and execution methods of these criminal activities.

Criminal acts are usually well thought out and concealed because the perpetrators try to hide the traces of their illegal actions. However, it is known that there is not a perfect crime, and accordingly, every criminal act always leaves a certain trace. When a criminal act or fraud occurs, there are traces of the person who has committed the crime at the crime, or in the life of the person who has committed the fraud, as finger prints that can remain at the crime scene. "Red flags" are of various natures and including things like an accounting anomaly, an unexplained transaction or event, unusual elements of a transaction, changes in a person's behaviour or characteristics, or just characteristics commonly associated with known fraud, especially particular individual schemes or groups of schemes (Knežević, Mitrović & Cvetković, 2019: 102).

It is only a question of the ability to notice certain indications and so-called "red flags", which may or may not always be a sign of criminal acts. In this sense, "red flags" can indicate that at first glance "something is wrong" indicating the first hints of possible criminal activities. Generally speaking, "red flags" associated with criminal activity in financial reporting and accounting include:

- accounting anomalies;
- complex business transactions that are difficult to understand and do not give the impression of a practical and logical purpose;
- large and significant amounts of transactions towards the end of the reporting period, usually at the end of the business year;
- frequent and inexplicable changes of auditors and audit firms;
- showing financial results that seem "too good to be true", or much better than the competition;
- high frequency of employee turnover or employment of inefficient staff in the accounting, internal audit and information technology sectors;
- significant transactions with related legal entities that are outside of regular business activities or being concluded with related parties that are not audited or audited by another firm;
- significant business transactions carried out across national borders in legal systems with a different business environment and culture;
- the existence of bank accounts or the operation of dependent legal entities or business branches in legal systems with favourable tax systems ("tax havens") where there is no clear business justification;
- unusual profits;
- internal control weaknesses;
- aggressiveness of executive management;
- obsession with share price by executive management;
- discrepancies in accounting documentation;
- account balances that are significantly overrated and underrated;
- business events have not been registered in the bookkeeping in a timely and proper manner, in the proper period and to the correct account, or the registration has been made in the wrong way and in the wrong amount;
- postings /registration has been made to certain accounts in the general ledger without supporting documentation, or based on documentation that is suspected to be unreliable;
- original accounting documents are not available, only copies, etc.

It should be emphasized that this does not represent the final list of indicators, nor is it the same in all business entities and represents the most prevalent signs of potential fraud. Auditing and accounting theory and practice recognize various indicators of fraud, but their presence in a specific entity

depends on whether there are elements of the fraud triangle, pressures, the possibility of committing fraud, as well as the tendency of employees to various manipulations. It should be emphasized that after the ”red” indicators are detected, various forensic techniques are applied, all for the purpose of detecting criminal acts.

Concept, Objectives and Characteristics of Forensic Audit

The loss of user confidence in the information presented in financial reports has negative implications for financial markets, and thus the economy. The development of civilization is based on numerous activities that apply modern scientific and technical achievements, although the performance of these activities is associated with the risk of various harmful consequences. Society should control the risks in these activities, which implies a systematic and planned approach with consideration of all relevant factors in order to minimize harmful consequences (Subošić, Cvetković & Vuković, 2012). Hence there is the need for the state, first of all, but also for professional organizations to do everything to prevent, if not completely prevent, the presentation of inaccurate financial statements to a large extent.

The financial statement audit is the procedure of checking and evaluating financial statements, as well as the data and methods used in the preparation of financial statements, on the basis of which an independent professional opinion is given on whether the financial statements in all materially significant aspects give a true and objective view of the financial situation and results of the business of a legal entity in accordance with the relevant regulations for the preparation of financial reports (Official Gazette of the RS, 2019.)

Forensic auditing is a new practical discipline within the auditing profession. It is a new area of financial statement audit, which has not been significantly regulated by professional regulations and standards yet. Forensic audit or ”Fraud Examination” (in the Anglo-Saxon domain), represents a special discipline within forensic accounting investigating criminal acts in financial reports (Petković, 2011: 99). Forensic auditing is a new branch of audit activity, that is, *a specific per se* scientific branch, which is dealt with by a forensic auditor.

The Institute of Forensic Auditors (IFA)[2] defines forensic auditing as ”the activity of collecting, verifying, processing, analyzing and reporting on data with the aim of obtaining facts and evidence that can be used in legal and financial disputes arising from criminal acts in financial reports and giving preventive advice”. According to Paul Thangam, forensic auditing is ”the application of accounting methods in the monitoring and collection of forensic evidence, usually for the investigation and prosecution of criminal acts such as embezzlement and fraud” (Vuković, 2021).

Forensic auditing is also defined as the activity of collecting, verifying, analyzing and reporting on data, with the aim of obtaining information and evidence, which can be used in court-financial disputes, arising from criminal acts in financial reports. It should also indicate the perpetrator of the criminal act and his position in the organization, i.e. the position he has had at the time of the criminal act, as well as establish whether he has committed the act independently or with other persons employed within or outside the legal entity. Namely, this type of audit deals with the detection of fraud, criminal activities, embezzlement, as well as other irregularities in financial and accounting reports.

A forensic audit is the examination of financial records to find relevant evidence that can be used in court or other legal proceedings. Forensic audit can reveal:[3]

2 The International Organization of Forensic Auditors in Belgium is a non-profit organization dedicated to the education of forensic auditors.

3 https://www.premiumaudit.rs/revizija-i-povezane-usluge/forenzicka-revizija/

- criminal actions related to tax evasion;
- financial fraud;
- criminal actions related to bankruptcy;
- criminal actions related to valuation;
- criminal actions based on relations among customers and suppliers;
- criminal actions related to procurement;

A forensic audit is focused on understanding and testing the system of internal controls to discover whether there are loopholes in the system that would allow fraud to occur. In this way, forensic audit acts preventively.[4] If a criminal act has already taken place, the forensic audit focuses on providing evidence for legal proceedings, conducting an investigation within the company, identifying fraud and helping to avoid major losses related to the fraud, so that the damage is minimal. Forensic audit helps to prove or disprove allegations and suspicions that are raised against the company (Petković, 2011:94). All of the above unequivocally indicates that the main obejective of the forensic audit is the detection of criminal acts in the financial statements, regardless of the materiality, that is, the degree of influence of the criminal act on the truthfulness and objectivity of the financial statements. In other words, the main objective of a forensic audit is to detect criminal activity in the financial statements, regardless of the opinions of the auditors.

In order to fulfill the main objective as a whole, the forensic auditor should find out who has committed the criminal act, where the criminal act has been committed, at what time, what damage has been caused, to calculate and report the material damage caused by the criminal act and, finally, describe the execution manner (Vuković, 2021). Auditors of criminal activities are experienced experts for documented monitoring of criminal activities in the business books of a legal entity. These are experts who possess a high level of professional knowledge, skills, values and ethics and use their knowledge to investigate criminal acts and manipulations in accounting. Such knowledge, de facto, involves: understanding criminal schemes, also, the ability to recognize warning signs, as well as other indications, which may be correlated with determined criminal activities. Also, such knowledge involves new information: first of all, related to criminal activities; then, the understanding and implementation of the algorithm, when investigating criminal activities; then, related to connections, with professional organizations, from this field, then, related to, continuous certification, from this field, also, understanding of symptoms, which refer to the social aspect and the behavioural aspect, in perpetrators of criminal activities, as well as, other aspects, in a causal-consequential correlation (Parnicki, Marić, 2020). Basically, forensic auditing results from the integration of accounting, investigative auditing, criminology and litigation services (Dada et al., 2013). Also, experts are supposed to be successful psychologists and to understand the mental mapping of potential fraudsters (Moretić- Mićić, 2021).

Forensic audit of financial statements as a new specialized service within the process of financial statement audit, involves contracting a special engagement with auditing firms and requires the work of auditors with special training and experience in fraud prevention and detection (Buckhoff, 2008). This type of audit focuses on areas where symptoms of fraud appear, performing a detailed examination of each individual transaction of that business segment. Realisation as a targeted audit is based on the suspicion of the entity's management or external audit that there are indications about a criminal act which has been committed. The characteristics of forensic audit are manifested in (Buckhoff, 2008):

- Examining most or all transactions in the company where hints of fraud have appeared;
- Focus on the detection of criminal acts and manipulation of financial statements regardless of materiality;

4 Ibid

- Checking a longer period of time than the business year;
- Reports must be admissible for court proceedings.

The forensic audit application of financial reports, with the objective of better corporate management, generates significant benefits for the company and for the business environment itself. The most important advantages of applying this branch of the auditing profession are:

- It strengthens control mechanisms, with the objective of protecting business from financial fraud.
- It can play an important role for those companies that are controlled by regulatory authorities, in terms of helping companies to ensure compliance with rules and regulations. For example, forensic auditing can be useful in helping businesses ensure efficient and effective procedures in combating "money laundering", corruption, etc.
- It can contribute to the effective identification of areas/organizational units in companies that generate loss.
- It can provide expert support in resolving court disputes.
- It helps to detect the existence of interest conflict among managers through the improvement of transparency and verification for the resources which have been used, whether in private or public companies.

In addition to the advantages, the process of conducting a forensic audit has certain disadvantages, such as:

- Poor execution of a forensic audit could consume excessive amounts of management time and could become an undesirable distraction to the business.
- Forensic auditing can encompass a large scope of fraud investigations to the smallest detail. Under certain circumstances, the forensic auditor may request that the scope of the audit be increased, which will cause a fee increase for performing the audit process.
- Some employees see a proactive forensic audit as an offense to their integrity, rather than the means of improving control procedures for the benefit of the business.

Forensic Audit Methodology and The Role of Forensic Audit Instruments and Techniques

The criminal act audit implies a specialized approach and methodology in the detection and explanation of committed criminal acts. The main objective of the forensic audit engagement is to prove, confirm or challenge the suspicion of the existence of a criminal act.

Forensic audit, as a newly formed branch of audit, does not have its own, special, generally accepted standards, that is, it does not deviate significantly from the standard audit. In fact, this new field of the audit profession is still not regulated by professional regulations and standards. However, certain International Auditing Standards can be considered universal in terms of traditional (external and internal) and forensic audits, although their application objectives are different. Analogous to the previous one, the basic methodology applied in the financial statement audit is also applied to the forensic audit, with adequate adaptation. The methodology of the forensic audit consists of procedures and actions, that is, the procedures that forensic auditors use to detect criminal acts and collect evidence.

In order to detect or prevent a criminal activity in the field of finance, criminal activity auditors and internal auditors, as good experts of criminal schemes, should recognize warning signs that repre-

sent economic indicators of illegal activities in the field of finance, identify them and apply effective procedures and tests for their disclosure. In order to reduce the risk of illegal actions in this area to a minimum level, it is of inestimable importance to establish a system of strong internal controls, and to implement preventive measures necessary to create an environment that is not conducive to illegal actions in the field of finance. In this way, the management is provided with support, and corporate governance in the company is strengthened by defining the responsibilities of management bodies.

According to the author of Forensic Auditing, Relevant to ACCA Qualification Paper P7 (Forensic Auditing), the forensic audit process consists of the following stages:

- accepting the investigation;
- investigation planning;
- evidence collection;
- reporting;
- judicial proceeding.

The auditor is obliged to collect valid evidence to support his findings and report in order to achieve the objectives of the forensic audit. The audit evidence collected in the forensic audit procedure must be objective, relevant, convincing and unequivocally indicate a committed criminal offense, because court verdicts are given on the basis of such valid and high-quality evidence. Six types of audit evidence are available to the auditor to achieve the set objective of the audit (Stanišić, 2022:7):

1) physical evidence;
2) statements of third parties;
3) mathematical proofs;
4) documentation;
5) introduction of the client's personnel;
6) mutual data relations.

The forensic audit procedures used to gather evidence are called audit tests. Audit tests are a fundamental instrument that forensic auditors use to achieve specific forensic audit objectives. In the financial report, the company makes certain claims about the financial position and the success of the business. The task of the forensic auditor is to test the profit and loss positions shown in the entity's financial report, in order to detect possibly deliberately caused irregularities in the recognition, their valuation and presentation. In their work, forensic auditors use tests divided into four main categories (Stanišić, 2022:12):

1) analytical tests,
2) observation and research;
3) transaction tests,
4) account balance tests.

Analytical tests of financial information are conducted based on the study and comparison of relations among data. Analytical tests represent the analysis of significant indicators and trends, fluctuations and relationships that are inconsistent with other relevant information or that deviate from preset values. They help forensic auditors to focus on unexpected changes or unusual relations in financial data providing a basis for planning other tests. Observation and research are used to test controls for which adequate documentary evidence does not exist. Auditors examine various persons and conduct ob-

servation tests to determine who performs a certain activity or how or when that activity is performed (Stanišić, 2022:14). Transaction tests refer to the examination of documents and accounting records involved in the processing of a particular type of transaction. Transaction tests allow the forensic auditor to detect irregularities by analyzing individual business events. Balance tests, which directly examine closing account balances, are applied to entity account balances that make up balance sheet items in the financial statement. The objective of checking the account balance is to detect irregularities by examining the final balance and not the individual transactions that make up that balance.

The audit methods, which auditors use to gather evidence, can be classified such as:

- physical examination;
- documentation;
- document record monitoring;
- inspection;
- confirmations;
- activity repetition;
- observation;
- harmonization;
- investigation;
- analytical procedures.

Forensic auditors aim to present valid evidence to the court, whereby an invisible transition from audit to investigation takes place. Subsequently, forensic auditors perform the activity of collecting, processing, analyzing and reporting on data for the purpose of obtaining facts and evidence due to manipulations in financial reports. In addition to the detection of a criminal act, determining the perpetrator of a criminal act is the most important step in a forensic audit. Employees and company management can be identified as perpetrators of criminal activities (Stanišić, 2022:14).

The characteristics of a computer as a means of processing data and information cause it to be used more and more in the auditing field, where it becomes one of the auditor's basic instruments or tools. The speed, accuracy, ability of mass calculation and the possibility of memorizing a large amount of data, the computer directly ranks among the most reliable devices that are necessary today in the field of audit profession, including forensic audit. For this purpose, computer-assisted audit techniques have been developed (Gašparević, 2021).

Regarding the use of computers and information technologies in the process of financial report auditing, one should start by defining the term "computer assisted audit tools and techniques" (Computer Assisted Audit Tools and Techniques - CAATT). The term CAATT in the broadest sense includes the use of information technologies in the implementation of audit activities (Brown, 2003). Therefore, CAATT includes two segments (Mijić & Jakšić, 2019):

- Computer-assited audit instruments / tools and
- Computer-assisted audit techniques

During the implementation of audit tasks, the auditor can use a large number of applications, i.e. tools. It is the auditor who, by using the computer as a tool, can significantly expand and deepen both the intensity and efficiency of the audit. Today, the auditing of criminal activities is simply not possible without the help of computer-assisted audit tools and techniques (CAATT). CAATT is a specialized computer programme, or process, used to test or otherwise analyze data in computer files. CAATT

consists of a computer programme that the auditor uses as a part of the audit procedures, in order to process the data contained in the information system of the business area that is the subject of the audit (Stanišić, 2018).

CAATTs represent an extremely powerful tool to auditors in the investigation of criminal activities in financial statements consisting of a large number of instruments and techniques, such as general audit software, utility software, data testing, application software for tracking and mapping, and audit expert systems. These techniques enable auditors/criminal investigators to focus on high-risk areas, perform systematic in-depth analysis of data while isolating transactions that have indications of criminal activities as well as a high possibility of their existence (David, 1998).

These techniques can significantly improve audit efficiency during the planning, implementation, reporting and follow-up phases. In many cases, the use of computers can enable auditors to perform tasks that would be virtually impossible to perform manually, or that would be very time-consuming. The computer is the perfect tool for sorting, searching, arranging and performing various tests and mathematical calculations (Stanišić, 2018).

The Information System Audit and Control Association (ISACA) has issued document G3: Use of Computer Assisted Auditing Techniques (CAAT) (Gallegos et al,2012) (Appah, Zuokemefa, 2013). Computer-assisted audit techniques are used for a large number of audit procedures, and some of them are (Stanišić, 2018):

- detailed testing related to transactions and balances;
- analytical review procedures;
- compliance tests of general information system controls;
- compliance tests of application controls;
- testing the possibility of breaking into a computer system.

CAATT as a computer programme, apart from being able to be applied to IT files to analyze those data and perform audit tests, these techniques also have the ability to revise/regenerate a significant amount of audit evidence during the audit, therefore the auditor should plan and pay due professional attention in the use of computer-assisted audit techniques. These data analysis tools allow auditors to identify irregularities through the use of statistical methods, trend analysis and anomaly identification. The application of data mining and big data analysis significantly increases the accuracy of fraud detection.

Audit techniques with the assistance of computers are quite simple and enable efficient automated data audit. Any computer system can do what it is programmed to do and is actually an automated replacement for manual business processes. There are various types of computer-assisted audit techniques and they are being refined to the point where the solutions are cost-effective. Sometimes business software can be used for this purpose (eg. Access, Excel). Regardless of which tools are used, the aforementioned computer-assisted audit techniques must be adapted to the situation, objectives and audit procedures (David, 1998).

Computer-assisted audit techniques and tools target potential risks that may occur in transactions or data. In the audit of criminal actions, this direction implies the incorporation of general criminal schemes and their specific warning signs into the programme of audit techniques with the assistance of computers. If the right approach is applied, computer-assisted audit techniques can be an integral part and add value to the audit strategy, plan and procedures. They also give a great advantage in terms of effectiveness and efficiency, because more can be accomplished with the same amount of resources (David, 1998).

A few years ago, special software products were available to assist auditors in the development of CAATT. IT technology has changed significantly since these products were launched, and those special computer audit software products have been replaced by report creation and other tools available with many standard software tools. It is often unnecessary for forensic auditors to attempt to purchase (obrain) specialized audit software product, because today there are many excellent data mining tools available to the auditor to help develop CAATTs. For example, specialized audit software such as ACL (Audit Command Language) also has the capabilities of CAATT tools (Stanišić, 2018). Some software solutions are presented below.

Table 1. *Software Solutions for Fraud Protection*

Company	**A software solution**	**Purpose**	**URL**
Case Ware	IDEA	Data analysis	www.caseware.com/ products/idea
Approva	BizRights	Automation and monitor control	www.approva.net/products/ bizrightsplat-form
Oracle/ Logical-Apps	Enterprise Control Management	Monitoring computer access and business transactions	www.oracle.com/solutions/ corporate_governance
SAS	SAS® Fraud Framework	Customer behavior monitoring, fraud detection	www.sas.com
SPSS	Fraud Detection and Prevention	Predictive analytics, data analysis	www.spss.com/fraud_ detection
ACL Services	ACL	Detection of fraud in business	www.acl.com
Agena	Agena Risk	Risk management	http://agena-risk.com
Abrutus Software	Arbutus Connect	Data analysis	www.arbutussoftware.com
Arbutus Software	Arbutus Query	Data analysis	www.arbutussoftware.com
Bennett Technologies	ESuraksha	Securing Web-based software applications	www.bennettss.com/ FraudAwareness.html
APEX Analytix®	FirstStrike® Fraud Detect	Fraud detection of suppliers and their payments	www.apexanalytix.com/ fraud/ detection-software.aspx
Information Active	ActiveData	Data analysis and fraud detection in Excel	www.informationactive.com/ad
ISGN-Fair Isaac	Falcon Fraud Manager	Credit card fraud detection	www.fico.com
FraudLabs TM	FraudLabs TM Fraud Detection Web Service	Credit card fraud detection	www.fraudlabs.com/ products.aspx

Sources: (Knežević et al., 2022:49).

Concerning the criminal activity audit, the most important quality of computer-assisted auditing tools and techniques is their ability to audit data and transactions, especially data integrity. The integrity of the data is subject to the influence of bad software, criminal acts related to improper data entry or other manipulations. The power of computer-assisted auditing techniques is based on their ability to efficiently audit large amounts of data, as well as their ability to audit 100% of data with relative efficiency. If we were to audit a large volume of transactions or data (information systems, financial reporting systems, and other systems), it would be very difficult for us without the use of computer-assisted audit techniques (Coderre, 2009).

The importance of computer-assisted auditing techniques is reflected in the analysis of large amounts of data relating a user. Data is the most important element of all accounting and business systems. Computer-assisted audit techniques can provide additional value when auditing data by adding value, thereby enabling auditors to integrate audit procedures into computer-assisted audit techniques. Such an audit is more efficient because the data is analyzed much faster and more thoroughly than would be possible if it were manual work. This process means that auditors during the initial stages of the engagement generally spend time developing appropriate tests and audit procedures. Most computer-assisted auditing techniques allow the automation of such procedures (Coderre, 2009).

The effectiveness and efficiency of an audit can be significantly improved by using CAAT to obtain and evaluate audit evidence. CAAT techniques represent a very effective means of checking a large number of transactions or controls over a large population, by analyzing given, selected samples from a large volume of transactions; they apply analytical procedures and perform essential examination procedures. The application of these techniques contributes to the completion of the audit work in a shorter time than is the case when other audit procedures are applied. It should be emphasized that auditors should have competences, that is, sufficient knowledge and skills for the development of an effective CAATT and for its implementation.

CAATTs techniques have built-in tools for documenting the work performed and the results of audit procedures used by auditors in their work, for example ACL, IDEA (Interactive Data Extraction and Analysis), PanAudit and Monarch. These specialized audit softwares allow auditors to automate data analysis processes, identify anomalies, and generate reports of findings. They significantly facilitate auditors the process of creating adequate, necessary audit work tests and presentation of results. The software of these auditing techniques can also import certain vendor files. Depending on the existence of certain limits, it is possible to import data into Microsoft Excel and Access, software that is generally available in enterprises.

Computer technology is one of the best risk and threat reduction tools. Technologies are often used to protect and defend computer and financial assets from any endangerment including criminal acts. Certain types of audit techniques with computer use software tools and techniques operating within the computer system. These types of software dealing with audit techniques are often called generalized (general) audit software (GAS - Generalized Audit Software) (Peter et al, 1990:428). Generalized audit software is software solutions that are purchased on the market and are primarily intended for the specific needs of auditors. Whether it is the needs of internal auditors, external auditors, state auditors or information system auditor, in every type of audit is the need for adequate and reliable data analysis (Mijić & Jakšić, 2019).

General audit software: ACL, IDEA, PanAudit, Monarch and others have clearly shown and proven their priceless value in forensic audit practice - when detecting malfunctions, criminal acts and computer crime in information systems and information technologies. The use of these software (GAS), computer-assisted audit techniques (CAATT) is a good way to oppose certain individuals or groups

that abuse and attack computer systems. One of the main advantages of generalized audit software, from the point of view of criminal act investigation, is based on the very fact that auditors are able to examine all records and not just the cause. To use CAATT or general audit software (GAS) in order to detect computer-related criminal activity, the auditor should follow the next seven steps (McGraw-Hill, 2012):

- defining audit objectives;
- contact with the data owner and developer;
- submitting a request for obtaining data through a formal means;
- creating or producing files as input to the general audit software (gas);
- verifying the integrity of imported data;
- understanding data;
- data analysis.

Information technology's integral part in the auditing procedure significantly enhances auditor effectiveness, precision, and adaptability to contemporary economic conditions. Big data analysis, real-time monitoring, and automation have all played a major role in the transformation in audit implementation. Data collection, analysis, and preparing audit reports are some of the challenges auditors face when using information technology. Information technology strengthens security controls, facilitates access and management of audit documents, and supports electronic documentation processes. Information technology can affect auditors' perceptions of business relationships. A good balance between technological advances and traditional audit principles is required for the integration of information technology in auditing. (Indriyanto, 2023).

Auditors, in order to get the maximum benefit from CAATT when performing their tasks, must have professional education and training in information systems. Nowadays, in modern corporate relations, particularly in international business, and while using information systems, auditors should communicate in English fluently (Zejnelagić, Fetahović & Moretić-Mićić, 2022). The modern concept of forensic audit is precisely based on the computer integration into the audit process with its application from the very beginning of the audit process - from the moment of audit planning, through implementation and reporting, to monitoring the task execution and realization of recommendations.

CONCLUSION

Criminal acts are harmful phenomena, which imply significant financial losses for businesses, companies and the state. In an effort to reduce the number of criminal acts, to reduce the negative financial effects, and to restore trust in financial reports, the emergence and development of forensic auditing have taken place. The increase in the complexity of business in the environment has increased the need for this discipline. Forensic audit is a specialized area of auditing that focuses on investigating criminal activity in financial statements and financial irregularities.

Forensic auditors use a variety of techniques and tools to collect, analyze, and interpret data to uncover suspicious activity and secure evidence that can be used in court proceedings. It is a detailed investigation of financial transactions and accounting documents in order to find possible irregularities. This can be done in several ways, including analyzing accounts, transactions, business processes, documents, electronic records and other information. Combining the knowledge and experience of

experts from various fields, such as accounting, auditing, law, informatics and forensics, forensic audit provides in-depth insight into financial transactions and business processes.

The importance of forensic audit techniques and tools (ACL, IDEA, etc.) is reflected in the detection of criminal acts (forensic techniques allow auditors to identify suspicious transactions and activities that could indicate criminal activity). By using sophisticated data analysis tools, forensic auditors can recognize patterns and anomalies that would otherwise go unnoticed. Also, the importance of these techniques is reflected in effective crime prevention (implementation of forensic tools and techniques helps companies to establish effective internal control systems that make it difficult to commit criminal acts). Regular audit and analysis of data deter potential perpetrators from attempting to commit criminal acts. And the collection of evidence is one of the benefits made possible by the application of the mentioned techniques and tools (forensic tools enable the collection and preservation of evidence in a way that is acceptable for court proceedings). The importance of audit techniques is also reflected in the increase in the effectiveness of forensic audit (using automated tools and software, forensic auditors can process large amounts of data faster and more efficiently, which significantly reduces the time required to conduct an audit and increases the accuracy of findings).

Regarding the paper, it is clear that the tools and techniques and their perspective in the future are of critical importance for all organizations that want to protect their financial resources and ensure the integrity of their business processes. With the constant advancement of technology and changes in the business environment, their importance and use will only grow, enabling organizations to effectively manage risks and ensure their success on a long-term level.

Concerning the paper, it can be concluded that forensic audit tools and techniques are of great importance for the detection and prevention of criminal acts in financial reports and in business, generally. Using modern methods of data analysis and specialized software, forensic auditors can effectively identify and document irregularities, providing key evidence for court proceedings and helping companies preserve the integrity of their business activities.

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FORENSIC LINGUISTICS AND POLICE WORK: STATE AND CHALLENGES

Jelena Vojinović-Kostić, PhD[1]
Administration for Police Education, Ministry of Internal Affairs of the Republic of Srpska
Banja Luka, Bosnia and Herzegovina

INTRODUCTION

Forensic linguistics is an interdisciplinary field of scientific study, built upon the foundations of linguistics and law. Forensic linguistics, from the standpoint of linguistics as the foundation of the discipline, consolidates the theoretical foundations and applies the methods of sociolinguistics, applied linguistics, psycholinguistics, stylistics, dialectology, phonetics and phonology, etc.

Forensic linguistics as part of the system of forensics is "a new branch of forensic science, it has been applied in criminal investigations and court proceedings in the resolution of various criminal offenses and civil disputes in the world for almost fifty years" (Nikolić-Novaković, 2017: 7), and as such has a number of specific methods and tools that it applies when proving, the choice of which depends on the subject of the analysis itself.

Forensic linguistics is the point of intersection of language, law and crime and its roots go back to 1968 when it was first promoted by professor of linguistics Jan Svartvik, a professor of corpus linguistics who first used the term forensic linguistics considering the verdict in the famous Evans case in which he was hired to analyse the statements, written and oral, given by Evans from arrest to trial. Through their analysis, he came to the conclusion that parts of the statements were rewritten, one part was written in spoken language and the other in administrative language, which implied that there had been some changes. Based on this evidence, Evans was posthumously pardoned in 1966 (Svartvik, 1968).

A detailed discourse, forensic analysis was published by Svartvik in a paper from 1968, entitled *The Evans Statements: A Case for Forensic Linguistics*. The published analysis marked the beginning of forensic linguistics. Along with Professor Svartvik, Professor Roger W. Shuy[2] is considered a pioneer of forensic linguistics. During his teaching career at Georgetown University, he cooperated with lawyers and prosecutors through the provision of consulting services and the collection of linguistic evidence within the analysis of recorded conversations (persuasion, coercion, blackmail, threats, abuse, police interrogations and hearings, confessions, etc.) and written documents (reports, contracts, seals, copyrights).

Forensic linguistics (FL) is founded on the methods and scientific achievements, as well as the theoretical frame of discourse studies, or discourse analysis (DA). The primary focus of FL studies is analysis and interpretation of written and spoken language (discourse), accounting for the needs of police, various security agencies, and judicial bodies (court, attorney's office). Linguistic forensics, via expert DA of language and communication, assists the above-mentioned upholders of law, in activities such as investigation of criminal and other cases, suspect identification, linguistic evidence collecting, and others. Security agencies, police and judicial bodies, assisted by linguistic forensics, provide evidence in court proceedings via analysis of written documents, recorded conversations, statements, etc., and

1 Jelena.Vojinovic-Kostic@mup.vladars.rs; jellianna@gmail.com
2 http://www.rogershuy.com/ae_forensic.html

work on the prevention of criminal activities, influence the upholding of public order, security and safety of citizens, the media, or social media.

The collaborative influence of linguistics with the above-mentioned subjects can be plainly seen, however, as the particular focus of this paper, collaboration with police will especially be highlighted. This collaboration is achieved through the combined expertise of both these areas of work, with the common goal of collecting evidence material via the detection of concealed messaging. This partnership plays an important role in the upholding of law.

APPLIED FORENSIC LINGUISTICS

Applied FL. Coulthard and Johnson (2007) list seven areas in which the application of forensic linguistics can be found: 1. the language of legal documents; 2. the language of police; 3. interviews with vulnerable groups within the judicial system, such as children or witnesses; 4. court interactions; 5. linguistic evidence and court expert witness statements; 6. authorship and plagiarism, and 7. forensic phonetics and speaker identification.

Gibbons (2003) states that the field of FL also encompasses the investigation of the language used in prisons, the development of court translation, provision of expert linguistic evidence used in court proceedings, and efforts in clarifying the language of law.

Each of the above-mentioned fields is defined by various specificities, the identification and presentation of which are outside the scope of this paper. The goal of this paper is to illuminate the applied uses of FL and DA statements and hearings, or in other words, interviews conducted by police officers with various actors within an investigation. DA encompasses both spoken and written discourse. For speech DA to be adequately applied, a comprehensive understanding of linguistics and its methods is required, as well as familiarity with nonverbal communication, a field of study which is unfortunately considered by psychologists to be unique to their field, and as such viewed as separate from the study of language. For this reason, it is important to note that communication is all-encompassing, and includes both verbal and nonverbal communication (in the case of hand-written discourse materials, it is also necessary to note its graphological characteristics), as well as to draw attention to the interdisciplinary field of psycholinguistics, which encompasses both linguistic and psychological, theoretical and methodological foundations.

The field of FL includes the study of the grammatical structure of discourse; the language habits of individuals, social groups, and their deviations; semantics, or, the meanings which language units may or may not have and the ways in which these meanings reflect on particular situations and the individuals involved, both in speech and in text; pragmatics, on the level of speech DA; phonetics and phonology, or, the identification of a speaker's origins via the identification of language markers and various dialects; sociolinguistics, or the variations in language habits within a group and the language characteristics of the group; code switching; language adaptation, manipulation, etc.

In this paper, we will also briefly examine the process of authorship determination, as well as the applied uses of DA methods within the framework of FL, in the process of collecting evidence material, as well as in investigative and judicial proceedings, using the examples provided by Coulthard and Johnson (Coulthard & Johnson, 2007).

The language of legal documents as a field of applied FL is in its core a form of language analysis, analysis of the style in which legal documents are written, as well as the DA of its contents via the

application of the methods of semantics and pragmatics, based on the foundations of their theoretical frameworks. DA of legal documents presents a joint effort of law sciences and linguistics in achieving a common goal – law interpretation. It can also be stated that law sciences, in the interpretation of legal documents (laws, sub-legal acts, etc.), are working within the field of DA by using DA methods.

The language of police as a field of applied FL includes the analysis of speech and writing of police officials themselves, with the goal of collecting data for linguistic studies, as well as the analysis of the administrative style used in written and verbal interactions. Such studies are undertaken with the aim of collecting language data, which provides an insight into the linguistic habits of the members of the police force, which then can be further used in, for example, court proceedings with direct involvement of police force members, the analysis of the adequacy of statement reproductions, etc.

Interviews with vulnerable groups within the judicial system, such as children and witnesses, is a field of applied FL which has so far only been investigated in fragments, simply because of the difficulty of accessibility, the protection of data, and the specific demands of the investigative proceedings. The DA of speech of children and socially vulnerable witnesses includes psycholinguistic, sociolinguistic and pragmatic methods. It should be noted that an adequate DA within this area can primarily be achieved by a well-trained psycholinguist.

Court interactions are a field of applied FL requiring the presence of a linguist in courthouses, or otherwise access to court records. In the case of DA of official records, it is important to note that the court reporters often include their own language habits in the official records. Therefore, it is of particular importance, as in most DA cases (except in the analysis of texts such as legal documents, the determination of plagiarism in scientific papers, and similar), to listen through the original audio recording of the hearing, or better yet, to watch and listen to the audio-visual recording, as these provide greater insight into both the verbal and the nonverbal behaviour of the observed subject.

Linguistic evidence and expert witness statements in court proceedings – this application involves the presentation of FL findings by an expert, during the execution of evidence proceedings.

Authorship and plagiarism as another field of applied FL finds its basis in particular, specific language habits of authors, some of which may be statistical, mechanical or fabricated, and as such stand out from the habits which characterise the authors' own voices. The foundational method of authorship determination is comparison, applied on both the spoken and the written word (Johnson & Wright, 2014). The method of comparison is also the foundation of other FL applications, such as DA interviews. Similarly, a specific individual's word corpus can be used in authorship determination, as it is influenced by many factors, such as education level, place of origin, occupation, age, etc. Sociolinguistics also has its role in the process of authorship determination, identifying the author via their dialect, sociolect and idiolect characteristics. By using lexis with ties to a specific geographical area, as well as on the basis of accent type and other factors, the place of origin of the author can be dialectically determined (Vojinović-Kostić, 2024).

Forensic phonetics and speaker identification – an individual's language habits may best be compared to a fingerprint. Each individual has their own voice, with an individual set of language and voice characteristics, which, akin to a fingerprint, are unique to the individual. In the analysis of forensic characteristics technical tools such as the spectrograph are used. Spectrographs which "graphically" present an individual's voice are typically a three-dimensional presentation of the human voice (time - horizontal axis, frequency - vertical axis, amplitude – degree of distortion). This field of applied FL may be the best developed, as well as the narrowest, requiring a forensic expert with specific knowledge in broad

areas of phonetics, phonology, acoustics, physics and computer science, which are then to be applied in the refining of recording and analysis techniques.

Linguistics and police. The significance of language in police, judicial and court work has been acknowledged by lawmakers, and as such, matters of language have found their representation in several legal acts, such as in the Criminal Procedure Code of the Republic of Srpska, which includes a number of statutes detailing the use of language and the written word. Acting in accordance with the statutes of the Criminal Procedure Code, in a variety of cases, police officers follow legal regulations fully aware of the importance placed on respecting the right to language and writing, as well as the consequences breaking these laws can cause in court proceedings, such as the questioning of the validity of the proceeding, court recording or comprehension of rights, human rights violations, etc. (Vojinović-Kostić 2024).

Police hearings and investigations. The significance of language in police hearings, statement taking and investigations, as well as the importance of familiarity with methods of language manipulation, language habits, individual speech characteristics, statement structure, and all the language markers used by police officers (either in hearings or during investigations) must be emphasised. Communication during statement taking is framed in the form of a dialogue, however it is meticulously guided, creating a psychological illusion of equality of the dialogue participants. Police officers may assume that any change in language behaviour during the statement taking process indicates concealed information in this area, carefully obscured among other data. Therefore, it is important to be able to define characteristic areas in statements which may be questionably true, based only on language characteristics, and making use of adequate practical examples. Such areas of importance may be, other than the above-mentioned: changing the structure of the statement, detailing, the use of different registers, answering avoidance, adjusting the statement, possibility or impossibility, the usage or non-usage of personal pronouns, remaining silent instead of answering certain questions, etc. Taken into consideration, measured, compared and analysed is the style of the individual, including all its sociolinguistic characteristics, dialectical and idiolectical characteristics, changes in register and functional style, phonetic and phonological characteristics, presuppositions, etc. DA also includes the tracking and comparison of an individual's nonverbal communication with their verbal statements, however, the importance of caution must be noted, due to the fact that, as stated by Chang and Chartrand (2003), mimicry can sometimes occur during a conversation, specifically, the mimicry of those who are in a position of power in a particular situation. In the case of a statement hearing, there exists a possibility of the police officer being mimicked, the likelihood of this occurring naturally increasing based on the psychological traits of the interviewee and the social contexts of origin, education level, age, etc. This problem may also present itself in speech, and in the case of speaking style and style characteristic overlap, Garrod and Pickering (2004) state that linguistic stylistic overlap increases with the amount of time spent in interviewer-interviewee conversation during the statement taking process, or, in other words, that stylistic overlap increases with time. The causes of this occurrence may vary, just as the causes of linguistic adaptation and code switching vary.[3]

It is necessary to note that verbal and nonverbal mimicry are not a one-way street. Not only does the interviewee mimic the interviewer, but the police officers themselves may mimic their conversation partners. This may be a planned occurrence, conscious or not, with or without a goal in mind. Unless planned, conscious and aimed towards achieving a certain goal (such as obtaining a confession or precise and useful information), it is unhelpful, and may even be detrimental to the investigative process. However, if the mimicry occurs with the aim of achieving a positive goal (positive relative

3 For instance, in cases of hostage situations, negotiators cycle through a number of phases through which the similarity, overlap or differences in their behavioural adaptations to the situation and the negotiating party are increased. Successful adaptation leads to successful negotiation. We might also add that one of the signifiers, perhaps the most transparent, is language (style, choice of linguistic tools, etc.).

to the uncovering of truth in the investigation), as a form of positive manipulation, it is useful and justified. For this hearing technique[4] to be successfully realised in its entirety, its instigator must have rich linguistic knowledge and the ability for language adaptation on all grammatical levels (phonetics, phonology, lexis, syntax). A 2014 study by Richardson et al. (2014), on a corpus of 64 suspect hearings, recorded between June, 2000 and December, 2008 (hearings lasting from 9 to 125 minutes) showed that, of the hearings, 25 of which resulted in a confession of guilt, there exists a significant influence of stylistic overlap. The measurements were done according to the rules of the LSM method (Language Style Matching). The results of the study have shown that the stylistic overlap between suspects and police officers was more significant in those hearings which resulted in a confession of guilt. The usage of language knowledge with the aim of achieving a goal introduces the field of critical discourse analysis (CDA). Heydon (2012) studied the language of police hearings and investigations, as well as the techniques used, from a linguistic point of view, on the basis of recorded material from the Australian police force, and only of those suspects who voluntarily agreed to it. Leahy-Harland and Bull (2016) studied how suspects[5] in criminal cases in the UK answered questions posed by police officers, and the connections between the reactions and answers of the suspects and specific behaviours of police officers during the investigative process. Anumudu and Abaya (2019) analysed, through the lens of CDA, how the police use language tools in reproduction, negotiations, and holding the positions of power and domination during suspect hearings in the police station Garbassawa, in Kadun Metropolis.

Apart from these, there exists a number of other studies by linguists on the topic of language usage (whether it be a DA or a CDA approach), in collaboration with police forces worldwide and accessible for the most part in various scientific-investigative databases and networks on the Internet.

Authorship determination. Determination of authorship is another field of investigation where linguistics may be applied. Authors have particular language habits, some of which may be statistical, mechanical, or fabricated, and as such differentiated from the habits characteristic of the authors themselves. The basic method for determining authorship is comparison, and it may be used on both spoken or written text (Johnson & Wright, 2014). Similarly, with the aim of authorship determination, a specific individual's word corpus may be used, influenced by various factors such as education level, place of origin, occupation, age, etc. Sociolinguistics also has its role in author identification, through the analysis of dialect, sociolect and idiolect traits. Therefore, an author's place of origin may be identified via the usage of specific lexis tied to a geographical location, accent type, etc.

Hate speech and verbal abuse. Hate speech is a widely used term today, and according to Muheljević and Drače (2019) its main characteristics are:

1) explicit and implicit verbal attacks on an individual or a group of people, with the aim of discrimination and causing psychological pain;
2) the attacks being achieved through hatred, insults, discrimination, inciting violence, threats, hierarchical subjugation, etc.
3) insulting and discriminatory classifications based on belonging to a certain group, etc.

Whether speech may also be classified as hate speech can be determined by linguistics, using the methods of psycholinguistics, pragmatics and semantics. Psycholinguistics may lead us from the words themselves to their psychological impacts on the targeted persons, while semantic (or the meaningful

4 There exists a number of hearing techniques and the researchers who have taken an interest in the topic include Heydon, Fred E. Ibaun, John Ride, Joseph Bukcley, Brian Jayne, Roland Backer. It is important to note that this area has become of increased interest to researchers in the last decades, with new techniques being suggested, and the existing ones improved through numerous analyses of their adequacy and success rate.

5 Eleven police stations across the UK and Wales were included in the study.

content of the speech including implicit and explicit meanings) and pragmatic analysis of the types of speech acts may help us determine if a specific act may be classified as a threat. Linguistics determines, via the usage of methods, scientific theories and knowledge, if a given sentence, said to a specific individual, in a given moment, represents a threat or sexual harassment. It is linguistics that defines verbal blackmail, recognizes verbal abuse, etc.

STATE AND CHALLENGES

This paper deals with the state of forensic linguistics in our country with a special reference to the state in the Republic of Srpska as well as the challenges.

State. The position of FL (DA and CDA included) in the countries of the Balkan peninsula is not enviable, but it appears that the interest exists, therefore it is up to linguists to promote FL through scientific studies, and to get more actively involved in the work of judicial bodies and the police force. There is not a great number of scientific studies in this field, and those that do exist have remained on the margins of the scientific community's interests. Some of the reasons for such a low interest in the field may be lack of knowledge, lack of contemporary themes, or a theoretical approach removed from practical experience.[6] Linguists have neither been employed in the police and judicial bodies nor consulted. It is also important to note that FL has frequently been studied by authors from different scientific fields (law, psychology, etc.), who may only have a marginal understanding of linguistic sciences, which may also have affected the position of FL in our communities.

Mirić (2017)[7], speaking on FL and its possibilities for development in Serbia, notes that the field, despite its wide applicability, is still being developed. Forensic linguistics as a study program that deals with linguistic methods as methods used in forensics with the aim of detecting law breakers exists only as an elective course at the Department of General Linguistics, Faculty of Philology in Belgrade, as an elective course in the VIII semester, according to accreditation from 2023.

This subject is not on the schedule of lectures for the summer semester 2023/2024, which leads us to conclude that the class was not implemented.[8] In the territory geographically covered by the Republic of Srpska, there is no forensic linguistics course at the faculties dealing with language studies, as well as at the faculties of security sciences, nor is it represented as an elective course in their accreditations. Even though the situation is like this, there is no lack of interest among security scientists in the field of FL and an understanding of its importance, great application possibilities, and knowledge of its position on a global scale within the framework of security agencies and science.[9]

The turning point in the development of FL is its entry into the curricula of professional training and specialist training of members of the Ministry of Internal Affairs of the Republic of Srpska, through independent thematic areas or within the framework of interdisciplinary topics. Namely, in the Republic of Srpska, apart from previous marginal interest, it would seem that FL is slowly gaining its

6 t is known that police officials are quicker to adopt theoretical knowledge if it is also practically applicable, which, thus far, has not been linguists' approach in our territory. A connection between theory and practice has simply not been achieved.

7 Faculty of Law, University of Niš, Serbia.

8 *https://www.fil.bg.ac.rs/sr/katedre/opsta-lingvistika/opsta-lingvistika-sa-stranim-jezikom)*

9 This is also supported by the fact that the Defence Center from Banja Luka published a book by Lidija Nikolić-Novaković, PhD, in 2017. *Forenzička lingvistika. Primena metoda forenzičke lingvistike u istragama pretnje (Forensic linguistics. Application of forensic linguistics methods in threat investigations*/translated by author*)* (Nikolić-Novaković, 2017) systematically presented the development of forensic linguistics, methods and its application in investigative actions with a focus on threat investigations and thus laid the foundations of forensic linguistics in our country.

place within the scientific community. The improved visibility and increased interest in FL have no doubt been influenced by the engagement of a PhD of Linguistic Sciences (basic studies: General Linguistics; area of specialization: Discourse analysis) as part of the work force of the Administration for Police Education, which in turn indicates a growing understanding of the significance of linguistics in achieving police work by the leading staff of the Ministry of Internal Affairs, and the Administration for Police Education. In 2021, as suggested by the Administration for Police Education,[10] the Ministry of Internal Affairs incorporated the teaching and specialist training curriculum "Behaviour of police in cases of familial abuse". The curriculum is centred on DA (CDA) as a specific, thematic area, and has been realized since through a number of planned classes by the author of this paper. It may be said that this has been the crucial moment for FL in the Republic of Srpska, after which several works on this topic have been published, encompassing both theoretical and practical, experiential approaches.

The scientific and professional journal *Bezbjednost, policija, građani* (*Security, police, citizens*/ translated by author) (published by Police Education, Ministry of Internal Affairs of the Republic of Srpska) has published a number of papers on forensic linguistics so far.[11] This is followed by works published by other publishers, which tells us about changes in the interest of the scientific and professional public in the field of FL, especially critical analysis of discourse.[12]

The fact that the author of these lines has been invited to professional training related to the actions of the police in investigations, police interrogations and hearings with a special emphasis on vulnerable groups, above all women and girls as victims of violence, speaks of the increased interest in the area of application of the CDA and DA.

In addition to the above-mentioned works, there are also a number of others that appear from time to time in magazines and collections of papers from scientific and professional conferences.[13] In addition to a brief history of the application of linguistics in court processes, the paper also presents methods of analysis when extracting forensic markers at different levels of the language structure, types of individual speech and language characteristics that serve as markers for identifying and verifying speakers, and the possibility of forensic analysis of written language samples is also indicated.

What is important to point out is that only one monographic publication on this topic has been published, and that is the publication of Nikolić-Novaković that was already discussed, which is in any case not enough considering the wide field of interest, variety of methods and applications of forensic linguistics.

Challenges. From the above, it can be concluded that FL has attracted the attention of our scientific workers, linguists, that there are scientific works that can serve as a basis for further work and research within this broad field of applied linguistics, and although their number is small their scientific contribution in relation to their number is unquestionable. The question arises, why is this so? Some of the

10 Then it was called Administration for Police Training and the name was changed in 2023.

11 Vojinović-Kostić J., (2019), Теоријски осврт на развој форензичке линвистике са посебним осврtом на специфичности дискурса пријетњи и уцјена као појавних видова ултиматума. *2/19, 69-79.;* Војиновић-Костић, Ј. (2020). *Језички аспекти савременог тероризма.1-2/20, 19-29.*

12 Војиновић-Костић, Ј. (2023). Законски оквир и испитивања осумњичених за кривична дјела са становишта лингвистике. *Баштина, свеска 59, 75-89,* Serbia, Приштина-Лепосавић: Институт за српску културу; Војиновић-Костић Ј., (2024). Улога форензичке лингвистике у раду полиције. *Зборник радова са IV међународног скупа „Савремени изазови и пријетње безбједности (Proceedings of the IV international conference "Modern challenges and threats to security* / translated by author), *11-20.* УНИБЛ, Република Српска, Бања Лука: Факултет безбједносних наука.

13 Kašić and Đorđević dealt with FL in a paper with the same title *Forenzička lingvistika u kriminalistici (Forensic linguistics in criminology* / translated by author*)* (Kašić & Đorđević, 2010). University of Belgrade, Faculty of Special Education and Rehabilitation, Serbia; University of Belgrade, Faculty of Security, Serbia.

reasons may be the fact that a small number of linguists are involved in the investigative work of expert witnesses and the availability of the corpus for analysis is insufficient, that the investigative procedure is closed to the public, that it is almost impossible to obtain the consent of the authorities who conduct investigations to attend the investigations as well as have access to the investigation material, etc.

Considering the importance of conducting investigations, the laws to which each phase of the investigation is subject, it is clear that changes in this part are unlikely to occur. We can say that there is a special challenge that the linguists who deal with FL face, no matter what field it is (phonetics, discourse analysis...) and to what extent it relates to investigative procedures and even court ones. As this is the difficult-to-access corpus for eventual analysis, and the employment of linguists within the security agencies and the Ministry of the Interior is of great importance, and the employment of a linguist within the Ministry of the Interior is a big step for the development of FL, which at the same time speaks of a high degree of scientific awareness. The knowledge within the aforementioned Ministry also resulted in such a procedure.

In addition to the above, it must be noted as well that the secrecy of the data which are part of the corpus is the focus of interest of forensic linguists and it is necessary to take care of it, which again, sometimes, can limit us in the possibilities of drawing conclusions and supporting them with evidence from the corpus.

Also, linguists, if they are not police officers, have difficulty in accessing hearings and interrogations, but also, through communication with fellow police officers, they can obtain a lot of information that can help in the analysis of the corpus, making conclusions, setting up hypotheses, etc. FL has the task of helping police officers in investigations through CDA of statements, documents, determining the authorship, credibility of statements, uncovering hidden information, etc.

The experience of the author of this paper speaks of the high degree of interest in CDA on the part of the police officers of the Ministry of Internal Affairs of the Republic of Srpska, the developed awareness of the applicability of its methods in investigations, and the importance of education in that field, and it is up to us, as linguists, to work on the polarization of FL, its promotion and the improvement of methods and the expansion of the field of application.

CONCLUSION

In this paper was presented a short overview of the applicative possibilities of FL in judicial and investigative work, as well as its methods and tools. From this we can clearly intuit that its possibilities for application are wide and significant. The interest for this interdisciplinary field exists on a worldwide basis, as evidenced by a large number of studies conducted by linguists in collaboration with police forces and judicial bodies, which also indicates that police forces, investigative and judicial bodies in their entirety are well aware of the possibilities and opportunities that FL brings. A particular joy to linguists is the constant growing interest in DA and CDA, as well as the fact that these methods are increasingly gaining significance in the analysis of written and spoken interviews. Their methods and theoretical findings are fast becoming a part of interview conducting techniques of police officers, or even the technique itself. The linguist's voice is becoming significant in this area of social work. That is the state of the world, but what about our territory?

More hard work on the development of FL is required, on discovering new methods and raising awareness of its importance, with the aim to raise the collaboration of linguists with police forces and the judicial bodies to a higher level.

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