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Original Article

Legal regulation of genome identification of natural persons in Ukraine during wartime: problems and perspectives

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ABSTRACT

This research analyzes the legislation on human genomic information in wartime conditions. The purpose of the article is to analyze the practical implementation of the aforementioned Ukrainian legislation in wartime conditions, to determine problematic issues and ways to solve them and to study positive international experience in this direction. The types, procedures, and peculiarities of mandatory state registration of genomic information by the military were considered. Positive international experience regarding the functioning of DNA sample registries was studied, advantages and disadvantages were outlined. The statistics of the identification of missing persons during the hostilities, the consequences of cooperation with the International Commission on Missing Persons, and the relevance of initiating the creation of collection points for DNA profiles of Ukrainians abroad were analyzed. The main problematic questions that occur during the practical implementation of the above-mentioned Law were identified; and the ways of their solution were planned. Proposals were made regarding: the provision of clear guarantees regarding the prevention of the risk of loss of genomic information or its leakage, as well as the owner's (controller's) duty to notify the person of such violations; introduction of an amendment to the Instruction on the Organization of the Burial of Military Personnel Who Died (Passed Away) During Military Service regarding the part concerning the prohibition of burying unidentified servicemen as unknowns; provision in the Electronic Register of genomic information of people a separate section, which will record information exclusively about persons who disappeared as a result of hostilities.

Keywords: Identification, Genetic examination, DNA, Regulation

Introduction

The full-scale armed aggression of the Russian Federation became a kind of "challenge" for Ukraine and, accordingly, an impetus for the legislative normalization of the legal restriction of the state registration of genomic information. As a result of active hostilities, the number of missing military personnel and civilians is constantly increasing significantly. This is not to mention the number of unrecognizable bodies (distorted to the extent that it is difficult to identify them independently), the identification of which is possible only with the help of molecular genetic examination. "Unidentified bodies will increasingly become more prevalent," notes A. Rizvich, Director of the ICMP on Data Systems and Data Coordination. "You will face more and more problems that require the establishment of a working system combining DNA sample collection and database operation" [1]. The success of the search process directly depends on comprehensive data collection and its complex processing. The realities of the time dictate the need to implement and use up-to-date technologies that have existed in the field of human genome identification for over

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three decades - molecular genetic studies of DNA and a data bank of human genetic characteristics, which will contribute to the prompt resolution of socially significant tasks… [2, 3].

This point of view is also supported by the General Director of ICMP, K.Bomberger, who emphasizes that "instead of using any other method of identification, it is important to begin with DNA analysis, since it is the starting point in establishing the identity" [4]. Therefore, currently the question of the practical implementation of the Law No. 2391-IX, 2022 [5]. in wartime conditions, definition of the main problematic issues and ways to solve them is becoming more and more relevant.

The scientific works of such scientists as Y. Sari, A. Marini, Y. Rahmawati, E. Fitriasari, P. Wardhani, A., Safitr, D., Dewiyani, L., Muda, I. Analyzed the works of V. I. Pokaichuk, who helped summarize the material and find ways to solve problematic aspects [6, 7].

Scholars, including B. Hamadiuk, O. Horpyniuk, P. Davyduk, O. Legka, O. Narozhna, I. Peleshok, S. Petrychuk, L. Prypolova, O. Symonenko, R. Stepanyuk, I. Khodyreva, M. Khrapitska, V. Shepitko, M. Yakymchuk, and others, have researched specific legal aspects regarding the prospects of applying molecular-genetic expertise for individual identification [2, 8-11]. Although the contribution of scientists is significant, many questions remain in the context of the problem under study, as well as taking into account the enactment of the Law No. 2391-IX, 2022 [5] remained neglected and require additional exploration.

Theoretical framework

Molecular-genetic examination belongs to the category of biological examinations, which determines the structure of human DNA held in the material of biological origin (blood, saliva, hair, bones, tissues, organs, etc.). "The data obtained as a result of the research make it possible to establish with the maximum feasible accuracy the belongingness of biological traces to a specific person whose DNA samples were taken from them directly or which are contained in databases formed by law enforcement agencies [9, 12].

The object of molecular genetic examination is human DNA (acids present in the nucleus of the cell - nuclear DNA; acids present in the mitochondria of the cell - mitochondrial DNA). "Nuclear DNA," study S. Petrychuk [10]. At the same time, due to its structure, mitochondrial DNA is more resistant to degradation and allows to determine the belongingness of biological traces to a person in those cases when the degree of destruction of nuclear DNA does not allow to establish any genetic signs. In addition, the amount of mitochondrial DNA in a cell significantly exceeds the amount of nuclear DNA, so even with a minimal amount of biological material obtained, experts have the opportunity to identify the person to whom it belongs" [10, 13, 14].

The operation of the human genomic information database in Ukraine until mid-2022 was established by the Instruction on the establishment of the functioning Expert Service of the MIAU. However, the sources of genetic marker records identified in this document have not been significantly effective in identifying missing persons, as this can only be implemented in conjunction with launching an automated DNA database.

Article 6 of the Convention of the Council of Europe No. 108 "On the Protection of Individuals with regard to Automatic Processing of Personal Data" defines that personal data cannot be subjected to automated processing if native legislation does not provide appropriate guarantees.

On the 9 of July 2022, the Parliament of Ukraine passed Ukrainian law No. 2391-IX [5] (entered into force on February 6, 2023), which governs problems related to: the entry and functioning of records about human genomic information; procedure order of selection of biological material; algorithm of government registration of genomic information of prisoners of war; the list of information subject to inclusion in the Electronic Register; procedure, terms of storage, extraction and destruction of genomic data. The MIAU is the holder this Electronic Register.

Adopted law envisages the introduction of a single-state DNA database, which accumulates depersonalized genomic information of all categories defined in the law. Access is granted to law enforcement agencies and intelligence agencies in the established order. As of today, the DNA database only includes genomic information obtained through forensic molecular-genetic expertise. It should be noted that more than 95 percent of molecular genetic examinations in Ukraine are conducted by the ES of the MIAU.

It is advisable to create a single DNA base. After all, according to this principle, DNA databases in the USA, Germany, The UK, Poland, Spain, Italy, and France are maintained, in which one holder and administrator of the DNA database is defined. For instance, in Great Britain, the National Criminal Intelligence DNA database was created in 1995, in which 6.6 million profiles were recorded by 2020, which made it possible to identify 731 thousand DNA samples between 2001 and 2020. As of the end of 2022, it contained about 10% of DNA data from the entire population. The peculiarity of the specified register is that its functionality provides for an extensive system and several levels of verification to solve the issue of further data storage in the system. In the US, Federal DNA Database Unit (FDDU) was established in 2000 to serve the large forensic community by helping to identify individuals whose profiles are in the National DNA Index System (NDIS) [14-17].

In addition, the Prüm Treaty dated May 27, 2005 (signed by Germany, Spain, France, Luxembourg, and others) provides for the possibility for the members of the EU to give each other automatic access to databases. It must be noted that today the automatic exchange of DNA data is ensured also between such countries as Portugal, Hungary, Romania, the Czech Republic, Sweden, Malta, Cyprus, Poland, Slovakia, Estonia, Lithuania, Latvia, Finland, Croatia, and Slovenia.

O. Horpyniuk, based on studying international standards for the collection and use of biometric data in law enforcement areas [8], identified the following main standards: data storage should be strictly controlled, especially in the sector of police activity;

data collection is only possible to prevent a real threat or halting a concrete crime; the need to inform the subject of personal data that was collected without his knowledge about such collection, if such information will not hinder the investigation; the obligation to promptly destroy personal data if they are no longer needed for the purposes for which they were kept [8, 18, 19].

It is worth noting that, unlike the experience of international DNA data registers, the feature of the Ukrainian register is that not only genomic data from the scene of the crime and individuals who have committed criminal offenses is ones to be recorded, but also next information: person's corpses, which is missing or unidentified, military personnel, policemen, etc. "Thus," notes O. Symonenko, "Ukraine has the potential to possess the most complete information about genomic, register in Europe " [11].

As the director of the European branch of the ICMP, M. Holliday noted: "The genetic database should include reference profiles of all families of missing persons so that in the case remains are found and posthumous samples are collected and profiled, they can be compared with all reference samples in the database. However, this will take time" [1, 20, 21]. This is evidenced by the identification experience carried out in the Western Balkans, where DNA samples were collected from families of missing persons and compared with the help of "blind comparison" software with DNA profiles. The "blind" process showed greater effectiveness than the process of recognition by guesswork.

Paragraph 4 of the Law stipulates that government registration passes in order to identify individuals who have committed criminal offenses; search for missing persons; identify unidentified corpses of people, their remains and body parts; identify persons who, due to their health, etc., cannot provide data about themselves [5].

Government registration of genomic information takes place in several stages: biological material selection and storage; direct molecular genetic examination (study) of biological material; and entry of information into the Electronic Register of Human Genomic Information.

It should be noted that as of January 2024, international partners have provided the NPU with 32 high-speed DNA sampling laboratories, and 12 more are planned to be received soon. As the head of the Main Investigative Department of the NPU, says, from the beginning of full-scale aggression of the Russian Federation in Ukraine, NPU detectives identified more than 3,600 people who were reported missing, and 2,100 Ukrainians remain unidentified today. Work is underway to enter DNA profiles of relatives into the database (7 thousand profiles are currently available for comparison), and more than 1 thousand people were identified precisely thanks to DNA expertise [22].

Thanks to the collaboration with the Commission on Missing Persons (located in the Netherlands), in 2023, tests were taken from more than 400 citizens of Ukraine abroad, and as a result of cooperation, about 90 matches were established [23]. During the conflict in the Western Balkans in the 1990s, the ICMP identified over 75% of missing persons. "DNA samples were obtained from unidentified human remains extracted from collapsed basements and mass graves, then compared with DNA samples from relatives of the missing. The information was loaded into the centralized database of the ICMP - the Integrated Data Management System (IDMS), the functionality of which provides for complex processing of information at the global level" [24].

It is worth noting the fact that as early as 1999, the specified commission started trying to use DNA to identify victims of conflicts in the former Yugoslavia. "Before, the recognition of missing militaries and civilians was carried out using "traditional" ways. Relatives or others who knew the missing person were asked to provide information about physical characteristics, such as tattoos physical deviations, etc. Furthermore, they asked about the probable circumstances of the disappearance. This included the possibility of error, especially in cases where the bodies were buried in mass graves and were probably mixed" [1].

Appositely, it was the International Commission on Missing Persons that first massively used new technologies for DNA analysis of human tissue during the identification of victims of flight MH17, which was shot down over Ukraine in 2014 (only 2 of the 298 dead bodies have not been identified to date). "The Dutch Institute of Forensic Medical Examinations worked around the clock to identify the victims of that disaster. No country could quickly cope with such a large number of examinations".

The MIAU, together with International Commission on Missing Persons, initiated creation of points for collecting DNA profiles of Ukrainians abroad (will work at the base of foreign representations of the State Migration Service of Ukraine) from January 2, 2024, which will help in the search for missing persons in the period of active hostilities. Biological materials will be transferred to the investigators of NPU for the search and identification of persons who have disappeared under special circumstances. As the MIAU Ihor Klymenko notes: "In order to organize a quality search, we need more information. Our citizens can fill out the questionnaire remotely in the electronic version or come to the authorized regions" [25].

The law provides for the following types of registration - mandatory (at the expense of the funds of the state money) and free-willers (on a paid basis) (Articles 5 and 6 of the Law [5]. In addition, "in case of the introduction of the state of war, bio material for purpose indicated in clauses 2 and 3, part 1 of Article 4 of this Law, is performed in a mandatory manner by policemen, military personnel, persons of the civil defense service, as well as members of public organizations of territorial communities (clause 2 of Article 8 of the Law). According to Clause 1 of Article 9 of the Law, prisoners of war must also undergo mandatory state registration of genomic information [5].

Even though the Ukrainian act No. 2391-IX [5] entered into force on the 6 of February 2023, the introduction of its norms, unfortunately, is not carried out properly. In particular, this applies to the category of persons who are subject to mandatory

government registration of genomic information (police officers, military, persons of the civil defense service, and others). If in the system of the MIA, whose structure includes the National Police of Ukraine, during May-June 2023, genetic DNA material was selected, then, unfortunately, this cannot be said about all military personnel. And this is even though back in April 2023, Vice Prime Minister I. Vereshchuk had a meeting with regional coordinators of the Office of the Commissioner for Missing Persons, the main issue of which was the advanced collection of genetic DNA material from soldiers mobilized into the ranks of the Ukrainian army. Following the Procedure for the selection of DNA samples, which was developed, an individual's DNA must be digitized and stored in the personal file of the serviceman. "Undoubtedly, it is very important during the war. The genetic material of all Ukrainian defenders must be stored in a single database of genetic characteristics. Having genetic samples will streamline the identification process," noted Irina Vereshchuk" [26].

However, the application of the theory in practice shows otherwise. So, in May 2023, Person 1 was mobilized by one of the Territorial Centers of Recruitment and Social Support, in which, accordingly, Person 1 underwent examination by a military medical commission, he was sent to training and, subsequently, to one of the army units of the Armed Forces of Ukraine. At the same time, the preliminary selection of genetic DNA material, in violation of Clause 2 of Article 8 of the Law No. 2391-IX [5] was not conducted. In August 2023, Person 1 died while participating in hostilities. Considering the fact that his body was burnt and he was unrecognizable, a criminal case was opened based on the fact of an "unrecognizable corpse" and, accordingly, DNA materials were taken. However, during his demise, there were military personnel present who provided testimony that it was indeed him who perished. The family of the deceased received a message that their son was considered missing. The investigators initiated the collection of DNA materials from relatives, however, again, in violation of current legislation, not all necessary DNA samples were collected from the deceased's father. The examination lasted more than three months, but the conclusion did not give the necessary result, since not all DNA samples were taken from the father. A re-examination was ordered, and accordingly, samples were taken again from the father and son of the deceased. Currently, the examination is ongoing, and the body of the fallen soldier has been in the morgue for more than seven months. What does this example demonstrate? If, following the law, genetic DNA material had previously been taken from Person 1 before being sent to a military unit, in the event of his death, it would only be necessary to take DNA material from relatives and check the data on the Electronic Register of Human Genomic Information for compatibility. This would save time and state funds, not to mention the mental state of relatives, who, in the best case, will be able to bury a soldier within a year.

The facts of the burial of unidentified servicemen as unknown are also not unique. Only after the appeal of the relatives, whose DNA materials are entered into the Electronic Register of Human Genomic Information, did the investigators initiate further examination, which requires the exhumation of the bodies of the buried servicemen. Accordingly, the Instruction on the Organization of the Burial of Military Personnel Who Died (Passed Away) During Military Service, which was consented by OMDU 2001 No. 185 (with amendments from September 19, 2018 No. 477) needs to have amendments in the part concerning the prohibition of the burial of unidentified servicemen as unknown.

It should be noted that in May 2023, the Unified Register of Persons Missing Under Special Circumstances became operational, with the help of which relatives can obtain an extract, based on which they apply to the Pension Fund to receive a pension in connection with the temporary loss of a breadwinner, or to obtain a certificate of missing person. At the same time, today there are quite a few cases when relatives contacted the National Police of Ukraine, have extracts from the Unified Register of Pretrial Investigations in their hands, but receive answers from the Ministry of Internal Affairs stating that their relatives are not listed to the Register of Missing Persons [27].

Also, some legal uncertainty regarding the compliance of the Law No. 2391-IX [5] with international standards of human rights. Thus, according to Article 4 of the Law, the Electronic Register is a functional subsystem of the information system of the MIAU. The administrator is a legal entity authorized by the MIA, which belongs to its scope of management or is subject to it. It provides " engineering, technology and software support of AISS (Automated Information and Search System), processing, preservation, protection and provision of information contained in the Electronic Register [5]. Considering that these two processing and management of access to DNA information are provided by one body, this may cause corruption risks.

It should be noted that in Spain, due to citizens' concerns about ensuring the confidentiality and proper use of DNA databases, a social survey was conducted. 59.7% of respondents identified the National DNA Analysis Agency (an autonomous government agency supported by a court) as the custodian of genetic information records, rather than the police authorities [28].

In Portugal, there is a DNA profile database (BDADN-P). It is worth noting that the profiles of genetic samples of missing persons depend on the scale of countries' use of the identification database [29]. The international regulatory framework of the European Union serves as a form of protection for every person from the unlawful access to genetic data that is on record. Solving problematic issues regarding the accounting of genetic traits involves the analysis, research, study and practical application of positive foreign experience, including that of the European Union countries [30].

Materials and Methods

The methodology includes a set of methods. The following main methods were used for wide disclosure of the topic:

systematic, dialectical method, method of description, analysis, comparison, and statistical method.

These techniques help reveal the purpose of the article namely to analyze the practical implementation of the Law No. 2391-IX [5] in wartime conditions, to identify the main problematic issues and ways to solve them, and to study positive world experience in this direction.

Results and Discussion

In addition, the term "genomic information" is given in the Law No. 2391-IX [5], which allows for collecting a fairly large amount of sensitive personal data. Also, the law does not provide clear guarantees regarding the prevention of the risk of loss of genomic information or its leakage, as well as the obligation of the owner (controller) to inform the person about such violations of the security of personal data is not established. We propose amending the Instruction on the Organization of the Burial of Military Personnel Who Died (Passed Away) During Military Service in the part regarding the prohibition of burying unidentified servicemen as unknown. In order to improve the effectiveness of activities, we suggest: strengthening monitoring of compliance with the law; clear guarantees are provided to prevent the risk of loss of genomic information or its leakage.

Conclusion

Therefore, the implementation of the Law of Ukraine No. 2391-IX [5], which allows for collecting a fairly large amount of sensitive personal data. provided forensic experts with an effective mechanism for improving the work of identifying individuals. At the same time, fulfillment of the norms defined by this Law revealed certain imperfections. In order to improve the effectiveness of activities in this direction, we suggest: strengthening the monitoring of compliance with the law on state registration of genomic data (according to Article 19, powers are assigned to the CHRVRU); specify responsibility in the legislation for violation of the legislation on state fixation (Article 20 clarifies that persons guilty of violating the legislation on government fixation data shall bear responsibility established by law); clear guarantees are provided to prevent the risk of loss of genomic information or its leakage, as well as the obligation of the owner (controller) to notify the person of such violations. We also propose amending the Instruction on the Organization of the Burial of Military Personnel Who Died (Passed Away) During Military Service in the part regarding the prohibition of burying unidentified servicemen as unknown.

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