IMPROVING THE USE OF GENOMIC INFORMATION

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Abstract: This article highlights in detail the potential problems and threats arising from the use of genomic information by unauthorized persons, ensuring the participation of a specialist in obtaining biological material from the crime scene, determining the categories of persons subject to mandatory genomic registration according to the Law "On State Genomic Registration", making mistakes and falsifying genomic information in a single database, creating a technically secure system for the safe operation of a single database of genomic information, as well as problems and threats, arising from the receipt of genomic information by "third parties" and proposals for their solution have been developed.
Keywords: human genome, biological material, information about the genome, state registration of the genome.

The process of safe use of genomic information is inextricably linked to the operation of a single database that ensures the collection and storage of such information. Such databases are created for the purpose of registering persons who have committed crimes, as well as searching for missing persons, establishing paternity and other legal facts. In recent years, the development of genomic technologies has made the process of obtaining such information somewhat easier. As a result, new databases of genomic information are being formed in countries around the world, and the importance of genomic information among citizens is increasing and it is causing their commercialization [1, p. 133].

It is known that the legislation of foreign countries regulates the identification models in various fields. In particular, banking, insurance, security, etc. is a clear confirmation of this. At the same time, many identification systems have been developed, which are implemented in connection with the storage of information about the genome [2, p. 49].

The creation of databases of such genome-specific information, in turn, also poses various problems and threats associated with the illegal use of genome-specific information. These problems and threats can be conditionally divided into two groups. The first group includes the problems and threats that arise when the genomic information in the database of genomic information falls into the hands of third parties, and the second group includes the problems and threats that arise in the state registration, storage and use of genomes.

Indeed, in many countries of the world, citizens voluntarily undergo DNA testing in various biological laboratories engaged in the activity of identifying people's biological material with DNA analysis, their artistic, sports and other similar abilities, their predisposition to hereditary diseases and their test results are at risk of being "leaked" into the hands of third parties.

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In addition, biological laboratories have been opened on the territory of some countries, and various experiments are being conducted in them. As a result of the non-transparency of the activities of such laboratories, there are cases of concern about the research carried out there.

In the territory of Georgia, Ukraine and other Commonwealth countries, biological programs are being carried out under the guise of studying viruses in biological laboratories established under the auspices of foreign countries. But what is the real purpose of these programs, and their lack of transparency, are causing serious concerns [3].

The aforementioned laboratories, after receiving the biological materials of individuals, are able to dispose of them according to their wishes. As a result, the possibility of such information falling into the hands of third parties and using it for their own malicious purposes is increasing.

When it comes to the use of such information for malicious purposes in foreign countries, first of all, some scientists put forward the idea that it is possible to create a biological weapon against this nation from the biological materials of certain nations, while other scientists emphasize that it is possible to use genome information to discriminate against individuals in various fields and falsify evidence.

For example, a 2015 article by A.Roberto and K.Heaney titled "We Can Wipe Out an Entire Culture" cites various conspiracy theories regarding the collection of genetic samples for DNA banks among Native Americans living on reservations, among these theories are the ideas that government agencies can use DNA to exterminate certain cultural or ethnic groups, including through biological weapons [4].

According to other scientists in the field of biology and medicine, the ideas about the possibility of developing biological weapons using genome information are not very reliable. Some researchers emphasize that it is not possible to create ethnic biological weapons based on the study of DNA data of a certain nation. In particular, S. Kiselyov, head of the laboratory of the Institute of General Genetics of the Russian Academy of Sciences, who is a supporter of such an approach, believes that the creation of genetic weapons is very dangerous and that it is easy to kill people with traditional methods: "...it is useless to create such weapons. First, in order to kill a person, it is necessary to affect the functions of breathing, blood circulation, etc., which are important for life. And they are few and they are the same in all people. And there is almost no chance of finding an ethnically significant vital function" [5].

Today, it cannot be denied that there is a possibility of illegal use against the owner of this genome information, even if there is no high probability of using the genome information of a particular nation to create a biological weapon against it.

In this regard, according to V. Debabov, a complete human genome "stores" information about susceptibility to various diseases. If genomic information falls into the hands of employer representatives, the consequences of this may be increased and intensified discrimination based on genetic characteristics at the employment stage [6].

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In foreign countries, in particular, in the United States, in 2008, the Congress passed the Law “On Non-Discrimination Based on Genetic Information”, according to which it is forbidden to refuse employment or health insurance based on a person's genetic information [7].

According to I. Adjunva, genetic discrimination is a negative attitude towards oneself by other people, without showing signs of any disease or disability, only because of its genetic structure [8].

It should be noted that such opinions are expressed not only by experts in the field of biology and medicine, but also by people involved in the field of law.

In particular, G. B. Romanovsky, taking into account the problem of the correlation of developing biotechnologies with human rights defined in the constitution, said that information about genetic predisposition can be used illegally not only by potential employers, but also by other organizations and institutions: insurers - a condition when concluding a life insurance contract - creates conditions, banks - believes that it can be used to make a decision about the possibility of providing funds and to conclude a loan agreement [9, p. 30].

Due to the fact that cases of discrimination of individuals based on their genome information are highly likely to occur in our country tomorrow, it is necessary to create legal grounds for its prevention. Therefore, based on the experience of foreign countries, it is appropriate to develop the draft Law “On Non-Discrimination Based on Genetic Information”. And the problems and threats to the second group that arise in the state registration, storage and use of the genome include:

1) The presence of access to employees who do not have permission to single databases of genome – related information (in the following places-a single database).

Article 8 of the Law “On State Registration of Genome” states that information about the genome, as well as information about the identity of the person undergoing the state registration of the genome, is confidential, its genomic information, as well as information about the person’s identity, are not allowed to be disclosed without the consent of the person or his legal representative, that it is an exception to be issued according to the requests of the bodies that carry out the inspection, inquiry, preliminary investigation and the court before the investigation, Article 9 states that prior to the investigation, the inspection, inquiry and preliminary investigation bodies, the Ministry of Internal Affairs, as well as forensic institutions of the Ministries of Justice, Internal Affairs and Health shall carry out state registration of the genome [10].

However, taking into account the fact that thousands of employees work in internal affairs bodies alone, the lack of precise identification of the entities that carry out the state registration of the genome to the level of the division may create an opportunity for an unreasonable expansion of the circle of persons working with this category of information, loss of control and illegal use of such information.

In order to ensure the execution of the law, it is necessary to develop regulatory legal acts that clearly determine the name and state units of the unit participating in

the state registration of information on the genome, their functions and functions, obligations in state bodies and institutions that carry out state registration on the genome.

2) The fact that specialists with the skills of obtaining traces of biological origin are not always involved in the examination of the place where the phenomenon occurred.

Failure to involve an expert in identifying and obtaining biological traces by the investigator during the inspection of the scene of the incident can lead to the failure to obtain or wrongly obtained such traces in many cases, the loss of traces of evidentiary value, and the failure to identify the person. Therefore, it is necessary to involve an expert in the examination of the scene of the incident and act on the basis of a scientific approach in identifying and obtaining biological traces and the mechanisms of their origin.

In practice, there are also cases where it is not possible to involve an expert to inspect the incident site. In such cases, the investigator has to independently identify and obtain biological traces. But analysis shows that the majority of practicing investigators do not have such skills.

Therefore, in order to develop the skills of specialists and investigators to obtain biological traces, there is a need to create a methodological guide on the procedure for identifying and obtaining biological traces during the inspection of the scene, and to train specialists and investigators.

3) Proper identification of the category of persons who must be state registered according to the genome, from the point of view of efficiency.

Article 17 of the Law "On State Registration of Genome" defines that convicted of serious and extremely serious crimes, crimes against sexual freedom, sexual intercourse with a person under the age of sixteen, and lewd and lascivious acts against a person under the age of sixteen (hereinafter - **sentenced individuals**), persons involved in the case as a suspect and accused for committing a serious and extremely serious crime, the genome information of unidentified persons and unrecognized corpses obtained in the process of examination, investigation, preliminary investigation of biological material prior to the investigation, it is established that the state register must be mandatory [10].

In our opinion, mandatory state registration of genome information of convicted persons specified in the above law is not enough. For example, because individuals who intentionally commit crimes that are not socially dangerous or are not as serious are often sentenced to penalties that are not related to imprisonment, some of them may have unfounded thoughts that they may not be punished for committing a crime and may have a tendency to commit a repeated crime.

At the same time, in our opinion, it is not correct to make compulsory state registration of the entire population or persons who have committed a crime due to carelessness. Such an approach leads to an increase in spending and a decrease in the efficiency of a single database. Because the majority of the population does not commit crimes, moreover, most of the people who commit crimes due to carelessness do not engage in criminal activities. As a result, a large proportion of such individuals

who have been publicly registered by genome may have their genomic information stored inefficiently in the database. Therefore, when determining the categories of persons subject to mandatory state registration based on the genome, it is necessary to take into account the possibility of determining the persons who may commit a crime again based on the criminogenic situation, as well as the possibility of allocating sufficient funds from the state for the implementation of this measure.

Based on the above considerations, we believe that there is a need to revise the categories of persons who must be registered by the state according to the genome specified in Article 17 of the Law "On State Registration of Genome".

4) "The Law "On Genomic Registration of Citizens" provides the grounds for entering genome information into the Unified Database and retention periods for each category of individuals who have been state registered by genome [10]. According to it, it is determined that the genome information will be completely deleted from the single database after the storage grounds and periods have expired.

When the experience of foreign countries was studied in this regard, the European Court of Human Rights found the British Government guilty of illegally storing genomic information of innocent people in violation of the requirements of Article 8 of the 1950 Convention on Human Rights and Fundamental Freedoms, a decision was made to immediately delete this category of genome information from the database [11].

As a result, in 2012, the Parliament of Great Britain adopted the "Protection of Rights" Act, which stipulated the indefinite storage of the DNA profile of convicted persons in the National DNA Database, as well as the storage of the DNA profile of persons acquitted or not charged by the court for a certain period of time [12].

But if the person commits a serious or very serious crime after their genome information is deleted from the single database, then the state will have to re-enter the genomic information into the single database again at the expense of the state. This is an excessive expenditure for the state.

Legal Statistics and Quick-Account Information Center of the Ministry of Internal Affairs provides information on the prior conviction of persons convicted even if their convictions have ended, if the person has been acquitted, on the fact that he was first convicted and then acquitted, if the criminal case against a person or a part of it has been terminated, the crime against him data on cases being initiated and then terminated will continue to be maintained in the database. Due to the fact that the procedure for using this information system is clearly defined, and it is possible to control who receives each information received from it, today such information is prevented from falling into the hands of third parties. Therefore, in our opinion, there is no need to delete the genome information of a person who has been state registered by genome once from the single database. Based on this, it is proposed to make appropriate changes to Article 30 of the Law "On State Registration of Genome".

5) A close study of the experience of foreign countries, as well as Uzbekistan, on the subject under study, showed that various errors may be made in the state registration of genome information or, in some cases, cases of falsification of data may occur. In fact, mixing it with the DNA of another person by a specialist or other

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official, misinforming the owner of the biological material on the information card of the biological material, making mistakes in obtaining information about the genome from the biological material, resulting in the inaccuracy of the information in the database and the death of persons unrelated to the work. may lead to suspicion or accusation.

In addition, if the above errors are made intentionally, then this problem becomes a legal problem and requires appropriate measures of responsibility for falsification of evidence against the persons who committed them.

In this regard, Israeli scientists in 2009 prove that "a person who has information about the DNA profile in the DNA database can artificially create a DNA profile that is exactly the same as the DNA profile in the database without taking biological material from the person who owns this DNA", thus, they proved that it is possible to falsify evidence by artificially leaving biological materials such as saliva, blood at the scene [13].

In addition, it is impossible to exclude cases of saliva or blood samples belonging to another person being left at the scene. This indicates the need for the relevant official conducting the criminal case to carefully, comprehensively, fully and objectively examine all the evidence in the case.

In order to prevent errors and falsification of evidence during the state registration of genome and to further increase the responsibility of experts, it is necessary to impose the duty of filling the card of genome information on the state forensic expert who received genome information from biological material. This makes it possible to check the database in the reverse order if any errors or falsification facts are detected;

6) Another problem in public registration of the genome is the creation of safe technical conditions for the efficient operation of such databases.

Article 8 of the Law "On State Registration of Genome" establishes the principle of non-disclosure in the state registration of the genome, according to which the information on the genome, as well as information about the identity of the person undergoing the state registration of the genome, are confidential.

In the experience of foreign countries, there are cases of attempts to obtain information from DNA databases.

For example, according to the DNA Diagnostics Center, which uses DNA samples to determine paternity, determine kinship, conduct reproductive health function research, and provide services to the public to help clients determine their ancestry, from May 24 to July 28, 2021, hackers carried out a cyber-attack on the database where the results of genetic tests are stored, and the information about the surname, first name, patronymic, and credit card numbers of 2.1 million people who passed the DNA test in the database was illegally obtained. However, since the DNA data is stored in another database (server), hackers could not obtain this data [14].

Although the hackers did not obtain DNA data, they were able to obtain other personal information, indicating that future cyberattacks of this type will continue to threaten the security of DNA databases. According to data, more than 150 billion US

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dollars were spent by the countries of the world for cyber security in 2021, which shows how much attention should be paid to this issue.

Taking into account the above, the system of state registration of the genome, the existence of software, computer equipment and protected communication channels, the equipment that allows obtaining information about the genome must meet all the requirements in terms of speed and accuracy, the main thing is that they go “outside” of the information about the genome in order to prevent its departure, it is necessary to be reliably protected from external influences, in particular from cyber attacks. Compliance with these conditions is a guarantee of safe storage of existing data in a single database.

7) One of the main problems arising in the practice of some foreign countries that are effectively using genome information bases is the failure of the competent state bodies to register all the persons who are required to be state registered according to the genome.

For example, 10 of the 97 convicts released from the Penitentiary No. 22 of the Kemerovo District Court of the Kemerovo Region of the Russian Federation due to the fact that biological material was not taken and sent to the expert institution for inclusion in the database contrary to the requirements of the Federal Law of the Russian Federation "On Genome State Registration" In accordance with the lawsuit filed by the regional prosecutor's office, a decision was issued to obligately register the genome information of all prisoners, and its execution was ensured [1, p. 135].

This problem has arisen due to the lack of mechanisms for checking the full registration of genome information of persons of the categories defined by the Law. This shows that the above-mentioned mechanisms depend on the “human factor” and if they are not automated in time, they can lead to a sharp decrease in their effectiveness.

Therefore, in order to ensure the full inclusion of information on the genome of individuals in the unified database, integrating the unified database with the database of the Legal Statistics and Quick-Account Information Center of the Ministry of Internal Affairs, Figure-1.1 (crime) and Figure-2 (person) statistical calculation it is necessary to create control mechanisms by establishing an automatic comparison system through cards.

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