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Peculiarities of the Legislative Regulation in Establishing and Functioning of National DNA Database Systems (Case Study of Great Britain, the USA, China and Russia)

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The study considers the history of establishment, current condition and perspective of the legislative regulation in establishing and functioning of national DNA database systems in some European and Asian countries. The authors study the peculiarities in establishing systems of DNA registration regarding a case study of Great Britain, China and the USA as the countries having a considerable experience in this field and the biggest national DNA databases. Thus, the main developmental characteristics in the forensic registration of these countries are identified. The aim of the study is to examine the theoretical aspects of the legislative regulation in establishing and functioning of national DNA database systems including the purposes to create the best model of the legislative regulation to meet the requirements of a modern society. The gaps in the state regulation of genomic registration are noted. It is determined that the existing laws and regulations in Russia do not completely satisfy the demands of the times for they considerably limit the sphere of application of DNA registration systems. As a result, the real potential of the DNA registration system in Russia is identified. Consequently, it will assist in establishment of a more effective model of DNA registration system taking into account the world's experience. Regulatory developments in legal activities as ways to improve legislative regulation of the genomic registration in Russia are set.

Keywords: DNA identification of the population in Eurasia, genomic registration, forensic identification, detection and prevention of crime.

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Research area: forensics; forensic activities; operational investigative activities.

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1. Introduction

The study analyses questions of DNA database establishment in different countries. It considered historical and national legal regulation peculiarities of establishing and functioning of the most significant DNA database of the world’s genomic information. Tendency in developments of genomic registration institutions have been identified.

2. Theoretical Framework

DNA is able to reveal much private information including filiation, disease-susceptibility, appearance, and even possibly some behavioral changes. Genetic data are unique and, rightly, may be considered a personal multimillion-letter code. Every cell in the human body contains such information that makes application of gene technologies very effective tool for many aims including analysis of genetic diseases, DNA genealogy investigation, ensuring long-term information storage and, of course, prevention and investigation of crimes.

3. Statement of the problem

Many states all over the world today establish their own national databases containing DNA profiles. However, the basis of existing national databases, as a rule, forms forensic DNA data banks for perpetrators or crime suspects’ profiles; genetic data from the crime scenes as well as genetic data of unidentified bodies and partial remains.

Power of modern DNA databases to ensure security and legal order is difficult to overestimate. Thus, for instance, according to the US researchers, by April 2017, the federal DNA database has facilitated to conduct over 358 069 investigations. DNA evidence has acquitted 350 innocents who had served 4787 years in prison, some of them being on death row. DNA also made it possible for law-enforcement agencies

to identify 149 perpetrators of these crimes who were subsequently convicted of 147 additional violent crimes, among them 77 sexual assaults, 35 murders and 35 other violent crimes while the innocents were in jail for their earlier offences (Dedrickson, 2017).

At the same time, approaches to the formation of modern national DNA databases often vary, in connection with which learning from other States experience can contribute significantly to establishing a more effective DNA registration system.

4. Methods

There are some possible types of DNA databases: the first system is based on the general DNA analysis of the population; the second system is founded on the DNA sampling procedure for a particular (the specific) list of crimes or other social abuses, and the third system is based on the specific DNA analysis of a case (Guillén et al., 2000). In this case, State's development of its own approach to the basis and principles of functioning of national DNA databases depends on many factors including the peculiarities of the legal system, crime rate, national security and public safety, how the society-State relationship is handled, and others. However, despite the wide variety of such factors, some common trends and patterns can be identified.

5. Discussion

The first attempts to establish regulatory framework for the DNA databases operation were made in Europe at the end of the 20th century. The initial stage of the European Legislation development on forming national DND databases is connected with the Recommendation R (92) "On the Use of Analysis of Deoxyribonucleic Acid (DNA) within the Framework of the Criminal Justice System" (Recommendation R (92)..., 1992) adopted by the Committee of Ministers of the Council of Europe on February 10, 1992.

Section 8 of the Recommendation R (92) laid down general requirements for storage of DNA samples and data including regulations on the destruction of DNA samples or other body tissues taken from individuals for DNA analysis; destruction of the results of DNA analysis when it is no longer necessary to keep them for the purposes they were used for; as well as the admissibility to retain the samples and the results of DNA analysis where the individual concerned has not been charged or convicted of relevant crimes only in cases provided for by national legislation and only in cases of the State security.

Mentioned Recommendations has had a significant influence on legislation formation regulating establishing and functioning of the national DNA databases of all the European States.

The first State DNA database in Europe and the world is considered Britain's National DNA Database (NDNAD).

In 1994, The British Parliament adopted the Criminal Justice and Public Order Act (Criminal Justice and Public Order Act, 1994) which became the legal basis for NDNAD. This Act allowed the police to take body samples without the individual's consent accused of the recordable offence as well as to search the information on the appropriate profiles in the database.

With the adoption of the Acts in 2001 and 2003, new amendments let the police of England, Wales and Northern Ireland retain indefinitely DNA samples and fingerprints of any individual arrested for the recordable offence even if the person was released without charge or found not guilty (Criminal Justice and Police Act, 2001) as well as take samples during the arrest and not only after the charge had been made (Criminal Justice Act, 2003). These measures have resulted in a significant increase of individual profiles of the DNA database in a short period of time. Thus, by 2006, since the Criminal Justice Act 2003 was adopted, the national DNA database has expanded by about a third to 3, 6 million profiles (Jones, 2006).

However, such expansion of the forensic DNA database with the help of the "innocent" people's profiles was considerably criticized by human rights organizations and community. Opponents of the established practice claimed that such increase in the number of profiles is inappropriate. Since innocent people usually don't commit crimes in the future, the expansion of DNA database by including a number of innocent people's profiles cannot significantly assist in solving many crimes than before amending the Act (Wallace, 2014).

On 4 December 2008, the Grand Chamber of the European Court of Human Rights in the case of *S. and Marper v. the United Kingdom* (known as the Marper case) delivered the unanimous judgment that indefinite storage of the DNA profiles and fingerprints violates Article 8 of the European Convention on Human Rights (right to privacy) (Case of *S. and Marper...*, 2008).

In response to this case, in 2012 Protection of Freedoms Act 2012 (Protection of Freedoms Act, 2012) was adopted, Chapter 1 of the Act laid down special regulations concerning destruction, retention and use of DNA samples.

In accordance with the Protection of Freedoms Act 2012, fingerprints and DNA profiles taken from the individuals arrested for or charged with a minor offence must

be destroyed following either acquittal or a decision not to charge. For more serious offences DNA profiles may be retained for 3 years. Biological materials taken from the individuals (but not from the crime scenes) will be destroyed within 6 months after they had been taken.

Thus, in 2012 Great Britain modified the approach to the formation of its national DNA databases focusing attention on the work with forensic data. Taking into account that similar processes in forming national DNA databases have been observed in many other European countries, Britain's experience can be conditionally considered to be "the European model" of building a system of DNA registration.

In the USA, the process of legislation formation and development of the national DNA database was in a little different way.

In 1994, the US Congress adopted the Violent Crime Control and Law Enforcement Act (H.R.3355 — Violent Crime Control, 1994) which authorized the Federal Bureau of Investigation (FBI) to establish a DNA database. On the grounds of this Act, the FBI has developed the Combined DNA Index System ("CODIS") which allows for federal, state and local forensic laboratories to exchange and compare DNA profiles electronically.

The basis for the functioning of the national DNA database is the DNA Identification Act of 1993, which laid down the establishment of the National DNA Index System (NDIS). It consists of (1) DNA identification records of the persons convicted of crimes, (2) DNA samples analysis recovered from crime scenes, and (3) analysis of the DNA samples taken from unidentified human remains. Similar bases such as the Local DNA Index System (LDIS) and the State DNA Index System (SDIS) have been established in accordance with the applicable State Acts and laws. All of them have been combined into a single system which is called Combined DNA Index System (CODIS).

In general, the CODIS system, as well as the one in Great Britain, was originally aimed at recording and analysis of the DNA data of convicted criminals. Thus, the DNA Analysis Backlog Elimination Act of 2000 (H.R.4640 — DNA Analysis, 2000) provided for collection of DNA samples taken only from persons in detention at the federal level, convicted of the relevant federal crimes, and from persons being on probation, released on parole or under supervision.

However, in 2005 and 2006, the US Congress expanded the list of persons subject to DNA registration. In 2009, the federal regulations (AG Order 3023–2008, 73 FR74942, Dec. 10, 2008) came into force. Based on the regulations, any US agency authorized to arrest, detain or supervise a person convicted of a crime must take DNA samples from

arrested, charged or convicted persons (Criminal Justice and Public Order Act, 1994). Similar regulations have been legislated in 28 states.

In 2013, the United States Supreme Court confirmed the lawfulness of taking DNA samples from arrested persons but not yet convicted of a crime. It also admitted that comparison of data obtained with the DNA samples of unsolved crimes in the national DNA database (*Maryland v. King*, 2013) is lawful.

It gave a strong impetus to the development of DNA analysis technologies determining the expansion of the national DNA database in the country. A notable example of the tendency to expansion of the DNA databases in the country is bill No. 1475 introduced by the senator from the state of Arizona David Livingston in February 2019. The bill provided for establishing of the DNA profiles of persons not directly connected with the criminal justice. In particular, the bill established the mandatory collection of DNA samples from persons who are required by law to submit fingerprints while applying for the license, certificate or a special permit; from persons whose employment or position requires submitting fingerprints; from persons who are voluntarily employed with law-enforcement agencies; from deceased persons; from persons who are required by law to submit DNA samples to test familial relationships and others (DNA identification database, 2019). Though public pressure forced to change the original bill a considerable number of non-criminal DNA profiles have been kept in its latest version.

Thus, there is a tendency towards the continued expansion of the national DNA database by including non-criminal DNA profiles as well as the introduction of new DNA analysis technologies.

One of the world's largest DNA databases is considered to be the DNA database of China.

Establishment of the DNA database in China is connected with the enactment of the DNA sampling Act in February 1988. The Act provided for the grounds for the mandatory DNA sampling of the persons accused or suspected of committing sexual or violent offences and in cases of voluntary registration for the purpose of searching and identifying relatives (Rules for taking samples, 2019).

Since then scientific development of the national DNA database system began, it finished in 2004 and is known as "System of Public DNA Databases of the Public Security Organs" ("DNA System") (National public security, 2005).

In May 2005, the Chinese Ministry of Public Security issued "Guidebook on the Establishment of the DNA Database of the National Public Security Organs" which authorized public security organs at all levels to establish a forensic DNA database,

to set objectives, responsibilities and requirements for the DNA database (Risk and legislative regulation, 2015) establishment.

The Chinese DNA system is a four-level structure: it comprises ministries, provinces, cities, regions and counties. It consists of three basic subsystems: the comparison system of DNA data search, integrated information management system and laboratory information management system. It ensures constant access to the basic business-systems of the public security through the standard interface of data service (Framework of the DNA database, 2019).

The DNA system synchronizes about 400 local DNA databases with the DNA database of the Ministry of Public Security. The DNA database comprises five categories: 1) DNA database of criminals; 2) DNA database of the material evidence from crime scenes; 3) DNA database of unidentified bodies; 4) DNA database of relatives of missing persons; 5) DNA database in the part of genotyping data of the concerned populations based on group, household surveys and forensic results providing the required statistical basis for the identification in regions or provinces.

It should be noted, however, that thanks to serious research work, China has been able to establish the world's largest DNA database including over 70 million profiles (Framework of the DNA database, 2019) in a very short period.

At the same time, an important tendency in forming the Chinese DNA database is its continued expansion through inclusion of non-criminal profiles. Therefore, according to the human rights organization "Human Rights Watch", there are many examples when DNA samples have been taken not in relation to specific criminal investigation, but in some other cases. Yet, researchers believe that the reasons of such events are non-transparency of the administrative and technical DNA sampling regulations (China: Police DNA Database, 2017) as well as lack of legislative regulation in this area (Risk and legislative regulation, 2015).

The first DNA database in Russia was established in 2006 within the forensic registration of the DNA data of the biological objects in accordance with the Order issued by the Ministry of Internal Affairs on 10 February 2006 No. 70 "On Organization of the Forensic Registration of Internal Affairs Agencies of the Russian Federation".

However, the law regulating functioning of the national DNA database was adopted much later, only in 2008. The current federal database of genome information in the Russian Federation operates on the base of the Federal Act of 03.12.2008 No. 242-ФЗ "On State Genomic Registration in the Russian Federation" (hereinafter referred to as the Act on genomic registration).

In accordance with Article 2 of the Act on genomic registration in the Russian Federation, State genomic registration is undertaken for the purpose to identify a person.

It should be pointed out that identification of a person in the domestic legislation is the only aim of genomic registration. However, in the US DNA Identification Act of 1993, sec. 4, for instance, purposes for the DNA data use are: purposes of identification conducted by the law-enforcement agencies; purposes of protection for the accused; purposes of research on the identification; purposes of quality control.

On the one hand, the only presented purpose of the genomic registration in the Russian Federal Act narrows the scope of the Act. Thus, in particular, domestic legislation doesn't provide for including profiles of suspects or accused of crimes in the federal database of genome information until their conviction. In this case, the Russian system is more in line with the European model.

On the other hand, the legitimacy of the stated aim allows to focus on the work not only with forensic but with other data.

Thus, unlike the countries where national DNA databases have been built only through forensic profiles, the basis of the federal database of genome information is formed by either mandatory or voluntary genomic registration.

Mandatory State genomic registration in Russia is conducted in respect to 1) persons convicted of or serving sentences involving deprivation of liberty for serious or very serious offences as well as for all the categories of offences against sexual inviolability and sexual freedom of the person; 2) unidentified persons biological material of which have been taken during the investigations; 3) unidentified bodies. Also domestic legislation provides voluntary State genomic registration regarding citizens of the Russian Federation, foreign citizens and stateless persons living or temporarily residing in the Russian Federation undertaken on their written statement and on a cost-recovery basis.

6. Conclusion

There are many positive experiences of forming national DNA databases in the world.

While forming the legislation concerning genomic registration, the Russian Federation mainly embraced the European model of the DNA database registration.

However, in Russia potential of the current Federal Act of 03.12.2008 No. 242 "On State Genomic Registration in the Russian Federation" has not been properly developed.

Regulations establishing mechanism and procedure of the voluntary State genomic registration have not been yet enacted. Matters necessary for the effective activities of the Russian Federation forensic agencies exercising formation and maintenance of genome information databases have not received the required legislative regulation. Appropriate legal mechanisms ensuring rights and lawful interests of persons included in the federal database of genome information are not functioning properly.

Nevertheless, in 2019 State genomic registration in Russia received a great impetus to its development because Decree of the Russian Federation President of 11.03.2019 No. 97 “On Principles of the Russian Federation Government Policy on Ensuring Chemical and Biological Safety for the Period up to 2025 and for the Future” made genetic DNA identification of the population and forming of the genome profile of the population one of the priority directions in state policy on ensuring chemical and biological safety.

Development of this area is impossible without fundamental change in the genomic registration legislation as well as improvement of related legal institutions for the achievement of such ambitious goals. In this regard, legislation on personal data protection, Federal Act on the Bases for the Protection of the Health of Citizens in the Russian Federation, civil, criminal and administrative legislations, etc. required detailed elaboration.

Thus, taking into account foreign experience, the Russian Federation has a real opportunity to form an optimal model of the legal regulation of the national DNA database registration to meet the needs of the modern society.

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Особенности законодательной регламентации построения и функционирования систем национальных баз данных ДНК (на примере Великобритании, США, Китая и России)

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В статье рассмотрена история создания, современное состояние и перспективы правового регулирования формирования и функционирования национальных баз данных ДНК в странах Европы и Азии. Авторы исследуют особенности построения систем ДНК-регистрации на примере стран, имеющих значительный опыт в данной области, администрирующих самые крупные в мире базы данных ДНК, — Великобритании, США, Китая. При этом выявлены основные особенности развития этого направления криминалистической регистрации в указанных странах. Цель настоящей работы состоит в том, чтобы исследовать теоретические аспекты правовой регламентации построения и функционирования систем национальных баз данных ДНК, в том числе в целях формирования оптимальной модели законодательного регулирования, учитывающей потребности современного общества. В работе также отмечены пробелы в отечественном законодательном регулировании геномной регистрации. Установлено, что действующие нормативные правовые акты в России не в полной мере отвечают требованиям времени, поскольку существенно ограничивают сферу применения систем ДНК-регистрации. При этом выявлен действительный потенциал системы ДНК-регистрации в Российской Федерации, позволяющий с учетом мирового опыта создать наиболее эффективную модель ее построения. Определены направления нормотворческой деятельности на пути совершенствования правового обеспечения геномной регистрации населения в России.

Ключевые слова: ДНК-паспортизация населения в Евразии, геномная регистрация, криминалистическая идентификация, раскрытие и предотвращение преступлений.

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Научная специальность: 12.00.12 — криминалистика; судебно-экспертная деятельность; оперативно-розыскная деятельность.
