The Creation of a National DNA Database for Forensic Evidence in Criminal Justice

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Abstract

The research aims 1) to study laws, DNA data storage authority and criterion, and a National DNA database creation in England, the United States, and the People's Republic of China, 2) to study legal problems that were obstacles to creating a National DNA database for forensic evidence in criminal justice, and 3) to propose the creation of a National DNA database for forensic evidence in criminal justice. This research is legal research with qualitative research and documentary research by studying data from academic articles, journals, academic documents, research, and case examples related to laws, DNA data storage authority, DNA data storage criterion, and the manipulation of National DNA database in England, the United States, and the People's Republic of China.

It found three proposals for creating a National DNA database: 1) DNA data storage authorization: prioritize protecting individual rights and freedoms as much as the state's interest in effectively maintaining national security and law enforcement. 2) DNA data storage criterion: This is because collecting DNA from the body inevitably affects privacy rights. Therefore, if it is considered that storing DNA from a person's body only slightly affects the person’s rights and freedoms more than the state’s benefit, it is more limited to creating a DNA database for forensic evidence in criminal justice. 3) National DNA database creation: improving the act to establish authority, duties, and criteria. Moreover, it allocates man, money, materials, and management to be ready and sufficient for successful operations.

Keywords: Legal Measures, DNA Database, DNA Data Storage Authority and Criterion, National DNA Database Creation, Forensic Evidence in Criminal Justice

Introduction

Deoxyribonucleic acid (DNA) is the basic structure of living things that can be transferred to offspring. Several variables in DNA make each person different. It can be used to prove a person's identity. Therefore, in forensic science, it is used as evidence to prove the culprit who discarded the parts of their bodies at the crime scene, such as hair, bones, teeth, saliva, blood, etc. A tiny sample of blood collected from a person can reveal that person's height. There is only a five-centimeter error, and it can still tell the appearance up to the color of the eyes or even the color of the person's skin with an accuracy of up to 80 percent. Many civilized countries have used DNA in the criminal justice process to prove the guilt or innocence of the accused. In England, DNA data has been used in the justice system to help investigate violent crimes since 1984. It allows police officers to request that doctors collect blood samples for DNA testing by relying on the consent of the piece being composed. In the United States, the use of DNA as evidence in legal cases was accepted in 1988 in Frye v. United States and Daubert v. Merrell Dow Pharmaceuticals, Inc. It was initially used in federal courts and eventually was used in state courts, and later, each state passed laws regarding the use of DNA as evidence in cases (Webster Jr, 2000). East Asian countries, like the People's Republic of China, are beginning to use DNA models in justice. In 1989, the Genetics Laboratory of the Institute of Forensic Sciences was China's first DNA analysis unit (Wimonses, 2020). Forensic evidence in criminal justice, matching the DNA found at the crime scene to that of the accused, has more detail and accuracy than fingerprint testing. Because of the fingerprint, latent fingerprints are often found at crime scenes that are difficult to capture in full detail. It also requires experts who have the knowledge and ability to analyze and compare fingerprints with those of the accused to conclude. While it is storing DNA such as hair, secretions, blood, etc., at a crime scene is more straightforward, there is little to no chance of error.

England has eight laws supporting the use of DNA data in the criminal justice process, such as the Criminal Justice and Public Order Act 1994 (CJPOA), which stipulates the manipulation of the National DNA database (National DNA database: NDNAD), established in 1995, and sets the criterion for collecting tissue samples (Wimonses, 2020). In the United States, three laws have been passed regarding using DNA as evidence in cases, and they have developed their DNA databases. In 49 states, DNA patterns are stored in all types of crimes (Boonthawatsak, 2015). In the People's Republic of China, a DNA database was created by the Ministry of Public Security of China called the "Forensic Science DNA Database System," known as the "National Public Security Agencies DNA Database Application System," in 2004. No legislation supports

manipulating a DNA database, but it is stored in indexes such as the Crime Scene and Convicted Offender Index. Etc. In early 2017, the government of the People's Republic of China amended the draft Public Security Administrative Punishments Law to increase the authority of police to collect biological materials. Including blood samples from victims and perpetrators of minor crimes has set standards regarding personal rights to be equivalent to the International Covenant on Civil and Political Rights. Therefore, it can be seen that establishing a national DNA database from local to national databases, has been in place for a long time. Moreover, DNA profiles can be compared between laboratories at each level integrated with laws and regulations supporting storage. It shows that foreign countries such as England, The United States, and the People's Republic of China are serious about the importance of creating a DNA database. Even European Union member countries see DNA databases as a tool to help solve criminal justice and bring perpetrators to justice. It also helps protect the innocent in the case (Tangon, 2019).

In using DNA to prove forensic evidence in criminal justice, it was found that investigators need to consider using DNA testing only in some instances because it is expensive, there are complicated steps, and they have to wait for test results from the laboratory for a long time. This is especially true in the DNA collection process, which requires the consent of the suspected perpetrator. This is coupled with the inability to search for DNA fingerprints from criminal history databases like fingerprint databases (Criminal History Registration Division, 2012), causing investigators to use more evidence because criminal history information from fingerprints can be accessed easily and quickly. In addition, DNA storage under the principle of consent or DNA comparison testing has specific storage characteristics for each case (case by case); not having it stored in a database is an obstacle to forensic evidence in criminal justice. This makes it impossible to use DNA data for practical forensics. Therefore, this research studies legal measures and the manipulation of DNA databases in England, the United States, and the People's Republic of China, countries that collect DNA from citizens and create a National DNA database for severe forensic evidence in criminal justice. To propose legal measures and create a National DNA database for forensic evidence in criminal justice.

Objective

1. To study laws, DNA data storage authority, DNA data storage criterion, and a national DNA database creation in England, the United States, and the People's Republic of China.

2. To study legal problems that were obstacles to creating a National DNA database for forensic evidence in criminal justice.

3. To propose the creation of a National DNA database for forensic evidence in criminal justice.

Literature review

Concepts of forensic evidence in criminal justice

Investigation and collection of forensic evidence are essential steps in the criminal justice process at the pre-trial level. That is when a murder occurs, and cases are brought to justice through complaints, accusations, or by the police themselves. In this regard, the methods used in conducting investigations have progressively developed with the progress of society from an interrogation system that used the torture of the accused to confess to an interrogation using modern methods, namely the use of evidence such as personal witnesses, material witnesses, and factual evidence to prove the guilt or innocence of the accused. This is especially the case in murder cases that often occur in private places, hidden from view, resulting in a lack of evidence. Therefore, it is necessary to rely on forensic science to prove evidence linking to the perpetrator (Sarakit, 2022).

Concepts of protecting people's rights and freedoms from DNA data storage

John Locke FRS (1632 –1704) was an English philosopher and physician referring to state power: “ Human beings have rights to life, liberty, and property. The state cannot arbitrarily interfere.” That is, people have the right to be protected from encroachment on their physical rights, which is a passive right and a proactive right to demand the state not to violate human dignity, and people have the right to privacy to make decisions and control their bodies without the state being able to intervene in any way. The rights and freedoms of life and body include what is inside a person's body, such as blood, urine, tissue from various body parts, etc. Therefore, government officials use their legal authority to take blood or specimens from the accused's body for DNA fingerprinting as evidence in a criminal case (Chuesiang, 2013). It is considered an act in which the state uses its power to intervene, which affects the rights of life and body of individuals. The rights and liberties of the people are protected according to that country's constitution, but the problems have been contested. This is the issue of collecting DNA from the body of the accused and the matter of individual consent. If I do not consent to the state's physical examination, will it be against the law? Moreover, can the state force DNA testing from the body to be a violation of the right to body and life? These legal criteria of each country are also different (Tangon, 2019).

Concepts of crime control and due process model

Even though the crime control and due process models were created for society to live together peacefully and be safe from crime, there are differences in concepts. If the state aims to control crime effectively, People's rights and freedoms will be affected. There was much shock as well. If the state intends to give many rights and privileges to the people, Crime control may be inconvenient, which also reduces the effectiveness of crime control. When considered, it is as if the two concepts are so different that they may seem like parallel lines that cannot coexist. If the weight is given one way, it must also be tilted low or high.

Concepts of preparing National DNA database

National DNA database It is a computer database containing DNA information. DNA data stored in the national DNA database will generally come from DNA found at the crime scene (Crime Scene DNA Samples) and the person's DNA. The working principle of the National DNA Database is to search stored DNA data to match newly added DNA data. For example, when DNA data recovered from a crime scene is added to the national DNA database. This DNA information will be tested against all DNA files stored in the national DNA database. A link between the two crimes could be determined when matched with DNA data from a crime scene in another case. Suppose such DNA information can be compared with the DNA information of the perpetrator. In that case, it will be possible to identify Such a person may be the accused of committing that crime. This allows the police to begin the investigative process to prosecute the perpetrators. The method of checking and searching for DNA information stored in the national DNA database is called “Speculative Search.”

Methodology

This research is legal research with qualitative research and documentary research by studying data from academic articles, journals, academic documents, research, and case examples related to laws, DNA data storage authority, DNA data storage criterion, and the manipulation of National DNA database in England, the United States, and the People's Republic of China.

Data Collection

Data were collected for the related documents following selection based on the criteria: 1) Authenticity: the related documents that provide original information consistent with the research’s objectives. 2) Credibility: the related documents that contain no error, distortion, or sources. 3) Representation: the related documents that are representative of the

study. Moreover, 4) Meaning: the related documents that are clear and easy to understand by containing significant or meaningful information for the research.

Data Analysis

Data were analyzed using the concept of forensic evidence in criminal justice, protecting people's rights and freedoms from DNA data storage, crime control and due process model, and the concept of a national DNA database creation.

Results

A study of legal measures and creating a DNA database for criminal forensic evidence in England, the United States, and the People's Republic of China found that each country places importance on creating a DNA database for criminal forensic evidence. The law is an essential parameter for DNA storage operations. When comparing rules for storing DNA data in the three countries, England has more than eight laws for storing DNA data. Most of them are laws to set regulations or storage methods that consider the rights and freedoms of those held. Later, the law on DNA storage was changed for the benefit of the state in maintaining national security and law enforcement efficiently. In the United States, emphasis is placed on the law linking data for the use of officials searching for evidence in criminal justice. The People's Republic of China stores DNA data without direction, but according to state policy, considering the storage goals is essential. The study found three problems that may hinder the creation of a National DNA database for forensic evidence in criminal justice:

1. Studying laws, DNA data storage authority, DNA data storage criterion, and a National DNA database creation in England, the United States, and the People's Republic of China. The research results found that:

1) England is a country that initiated and gave importance to the use of forensic science for forensic evidence in criminal justice with the Police and Criminal Evidence Act 1984 (PACE), which laid the foundation for creating a DNA database for forensic science and extending the collection criteria to other laws, since the method of storage, storage conditions, officials who can store, persons that may be collected, consent, duration of storage, destruction, etc. Laws in England are gradually becoming more flexible. In the beginning, it was legal to collect DNA from people based on consent only. Later, they can be forced to store them without needing consent. The law also stipulates additional criteria for storage, from the classification that police officers can collect themselves from Non-intimate or being able to store DNA that is not limited to offenders but can be stored from innocent

people too. In addition, data obtained from certain types of DNA storage can be stored indefinitely. Alternatively, it has not been destroyed and is included in the same database as fingerprints in the form of criminal history. It also allows the authority to search for information and match DNA directly to the police.

2) The United States has pioneered the use of DNA analysis in criminal investigations and trials, using forensic science to identify sexual and violent crimes. The central government has enacted a law mainly to prepare a DNA database. The rules for storing DNA depend on the laws of each state, which has a database created. DNA is divided into various storage indexes. The DNA data index for searching with the Convicted Offender and Forensic Index is used for forensic evidence in criminal justice. The Federal Bureau of Investigation (FBI) is developing laboratory access to DNA data regulated by the federal government, with each participating state required to sign an MOU with the scientific laboratory of the Federal Bureau of Investigation (FBI) to ensure compliance. It is subject to compliance with the Federal DNA Identification Act.

3) The People's Republic of China is a socialist state ruled by a democratic dictatorship controlled by the Communist Party. The government has absolute power. When the government has a policy and sets a goal to collect DNA data within a specified time frame, government officials can forcibly collect from the entire population of all genders and ages without criteria or consent. As a result, the People's Republic of China has a vast amount of DNA data that can be quickly collected and targeted. In addition, the Chinese government has created a Data index that classifies storage data and established the Genetics Laboratory of the Institute of Forensic Sciences. It is the first DNA analysis unit in China, and a DNA database has been created by The Ministry of Public Security of China (Ministry of Public Security) named the “Forensic Science DNA Database System” known as the “National Public Security Agencies DNA Database Application System” to store and retrieve information. DNA as well. However, the People's Republic of China does not yet have a law to support the creation of a DNA database, including no law to protect citizens' rights, freedoms, and privacy from storage. DNA or the duration of storage or destruction in any way

2. Studying legal problems that were obstacles to creating a National DNA database for forensic evidence in criminal justice. The research results found that:

Legal issues regarding authorization to store DNA and setting criteria for DNA storage should be considered as follows:

1) The lack of a law that authorizes storage by specifying storage methods allows police to collect DNA from suspects without needing to provide it to a doctor, or only evidence or experts can be the collectors.

2) The lack of laws that allow police officers to order suspects or offenders to collect their own or lack of rules that will enable police officers to collect it from suspects at the crime scene or from the suspect who was caught without consent.

3) The lack of laws that allow DNA to be stored in a database for an indefinite period or no destruction.

4) The lack of laws or policies for DNA storage is no longer limited to collecting from offenders or suspected offenders. Still, it can also be collected from innocent people.

The problem is the lack of laws and policies for creating and linking a DNA database for systematic searching. Some issues should be considered as follows:

1) The lack of laws or policies to have agencies for storing people's DNA patterns in databases at the central, regional, and local levels and linking data systematically.

2) The lack of laws or policies to create various information index systems for searching by consenting to import data into the National DNA Index System and these data sent to be stored in the DNA database.

3) The lack of law or policy to import data of arrested persons (Arrestee Index) into the national DNA database in the form of criminal history.

4) The lack of laws or policies to collect and preserve DNA from arrested persons, suspects, or offenders who are not citizens of the country.

Problems of lack of policy and management regarding DNA databases for systematic searching. Some issues should be considered as follows:

1) The lack of a serious policy to support the creation of a systematic DNA database with a target for collecting DNA from citizens each year.

2) Problems with amending laws that are obstacles to pushing forward policies to support the creation of a systematic DNA database by setting a goal for collecting DNA from citizens each year.

3) Management problems regarding people, budget, modern materials, and equipment for systematically linking data.

4) The lack of a central agency that compiles a DNA database for searching criminal history information by linking information from various agencies systematically

3. Studying the creation of a National DNA database for forensic evidence in criminal justice. The research results found that:

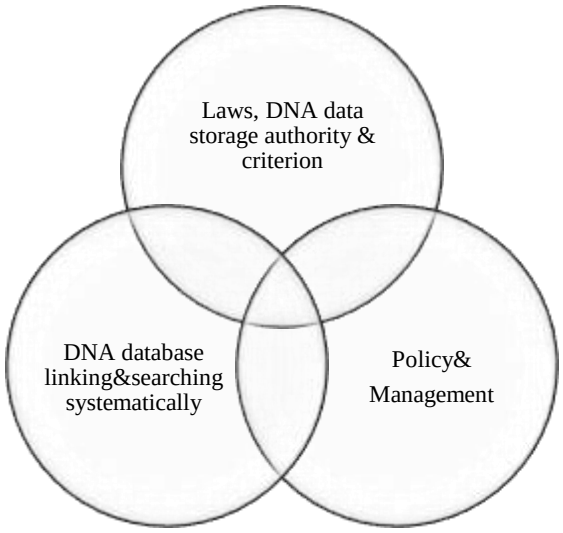

Figure 1: The creation of a National DNA database

Creating a National DNA database cannot be possible without a leading agency that is the center for compiling the DNA database for searching criminal history information by systematically linking information from various agencies. In addition, it is also necessary to amend the law to give authority and set collection criteria to government officials openly but still consider individual rights according to international principles. England expanded the scope of storing DNA from innocent people in a database based on consent, collecting DNA from suspects, suspects, or arrestees compulsorily apart from serious offenders, specifying the storage period without destroying data, etc. The United States is a country that has played a role in pioneering the creation of a DNA database for use in criminal investigations by creating a DNA database at three levels: the local level, the state level, and the national level, linking information between them in a systematic way. An agency controls information searching, disclosing, keeping, or destroying information under the law. The People's Republic of China recognizes the importance of creating a DNA database to the point of forcibly collecting it from citizens without law, creating a DNA bank, establishing a modern scientific agency to support data management, and setting a goal to store a more significant amount of DNA to cover the entire country's population, respectively. It may be concluded that the creation of a National DNA database consists of 3 groups: 1) law, DNA data storage authority, and DNA

data storage criterion; 2) DNA database linking and searching systematically; and 3) Policy and management (Figure 1).

Discussion

1. Studying laws, DNA data storage authority, DNA data storage criterion, and a National DNA database created in England, the United States, and the People's Republic of China were consistent with concepts of forensic evidence in criminal justice, concepts of protecting people's rights and freedoms from DNA data storage, and concepts of crime control and due process model. Law is essential in authorizing and setting criteria for DNA data storage in criminal justice and considering human rights no less than crime control and due process. However, suppose that storing DNA from a person's body only slightly affects their rights and freedoms more than the state's benefit. In that case, it is more limited to creating a DNA database for forensic evidence in criminal justice.

2. Studying legal problems that were obstacles to creating a National DNA database for forensic evidence in criminal justice was consistent with protecting people's rights and freedoms from DNA data storage and concepts of crime control and due process model. Prioritize protecting individual rights and liberties as much as the state's interest in effectively maintaining national security and law enforcement. Legislation must find a balance between controlling crime and being legal. In order the criminal prosecution process to effectively control crime and at the same time affecting the rights and freedoms of individuals as little as possible. It provides an opportunity to fight the case thoroughly and freely. If weight is given to any one line of thought, it will upset the balance of the criminal justice process. Moreover, if there is a lack of law or the law is not strict, the officials may not have the authority to carry out their duties.

3. Studying the creation of a National DNA database for forensic evidence in criminal justice was consistent with the concept of preparing a National DNA database. The police begin the investigative process to prosecute the perpetrators. The method of checking and searching for DNA information stored in the national DNA database is called "Speculative Search." Expanding the database to include DNA collection from offenders of all types of serious crimes and increasing the power of the officials to collect DNA from people arrested for certain crimes. It is believed that expanding the scope of the database will increase the opportunity for government officials to prosecute real offenders.

Suggestions

The law for storing DNA has limitations on both the authority and the criteria for storing DNA in a database. Since the collection cannot be forcibly collected from the offender but can only be done with their consent until failure to preserve DNA data from suspects for linkage research, containing DNA must be done on a case-by-case basis. It is not stored in a criminal history database. Consequently, it is an obstacle to searching for information for forensic evidence in criminal justice.

1. **There are three recommendations from this research study:**

In terms of collecting DNA data, the authority

Its importance in protecting individual rights and freedoms is more important than the state's interest in maintaining national security and enforcing the law effectively. As a result, the rule for storing DNA in criminal justice has many limitations in authorizing government officials to store DNA in databases for forensic evidence in criminal justice. Therefore, there are suggestions as follows.

1) Police officers should be empowered to order offenders to collect their DNA or have police officers contain DNA according to the nature of the offense using appropriate storage methods according to international standards, such as violent offenses. General offense Includes crimes that can be arrested according to law, which can be extended to suspects. They use non-invasive storage into the body (Non-Intimate Samples) such as saliva samples (Saliva), cheek mucosa (Mouth Swab), hair pulling to take the hair roots for examination, etc.

2) Police officers should be empowered to order or collect DNA themselves without the consent of the person committing a violent crime. Arrestable offenses can be recorded, including general violations that can be extended to suspects.

3) Police officers should be empowered to order offenders to collect their DNA or have police officers contain their DNA without the assistance of a doctor and may use force to manage it if necessary, such as organizing Collected by scraping the mucosa of the mouth or pulling hair to examine the hair roots.

4) The Attorney General may exercise authority or assign government officials to collect DNA from 1) persons who are in the process before the court renders judgment, including persons who have been arrested, people who are being prosecuted, 2) people whom a court of law has convicted, 3) people who are in the process after the court has given

a verdict, and 4) people who are not citizens of the country but are detained under the authority of the country.

5) The Director-General of the Department of Corrections may exercise authority or assign government officials to collect DNA from persons convicted by a court or convicted by a court of having committed an offense.

6) Probation agencies may exercise authority or assign government officials to collect DNA from offenders who have been temporarily released, removed from prison with conditions, or are on parole. Or is a person who is on probation

7) Consideration should be given to authorizing government officials to order offenders to store their DNA, or government officials can force DNA storage by any means as necessary as they deem appropriate, and if that person refuses to have it stored, that person may be criminally punished

8) Giving authority to store DNA to government officials should be done carefully, considering individual rights and freedoms. There should be a reason for keeping it. Storage details are recorded. Moreover, it should be recorded as evidence while collecting DNA every time.

In terms of storing DNA data, the criterion

The rules for storing DNA have human rights issues. This is because holding DNA from the body inevitably affects privacy rights. If it is viewed that keeping only a tiny amount of DNA from a person's body is a matter that affects the rights and freedoms of the individual more than the benefit of the state, establishing criteria for storing DNA has many limitations that hinder the forensic investigation of criminal justice. Therefore, there are suggestions as follows:

1) The offenses involved in storing DNA should be divided into severe offenses and general offenses. By giving authority to government officials at various levels, they can provide orders and keep them according to authority, duties, and responsibilities.

2) The power of DNA storage should be extended to all persons whose DNA is stored, not only offenders, but it can be collected from people who are suspected of committing crimes, such as arrestees, suspects, accused persons, etc., and even if they are not the perpetrators later. Therefore, the person has entered the process of verifying the truth according to the principles of forensic science, which is fair to all parties. Because the people whose DNA is stored are no longer limited to those who have committed crimes under the law or have been convicted by a court.

3) DNA storage conditions should be specified according to scientific storage methods according to international standards. To enable police officers to order offenders to collect their DNA or have police officers contain it. Not disposed of, only doctors or specialists can do storage. This makes it convenient and fast, saves on budget or personnel, etc., and reduces obstacles and delays in the work of police officers.

4) The scope of the offense should be expanded to give state officials more power to order offenders to collect their DNA or to collect DNA from the offender's body because the benefits of the state have more weight. If the storage of DNA slightly affects a person's right to the body, such as choosing to use a storage method outside the body or allowing the person being collected to do so themselves, etc. The case still aims to provide rights and freedoms to the people under the principles of crime control and legality (Due process, crime control).

5) Government officials should be empowered to order offenders to collect their DNA or to compulsorily collect DNA from people arrested before the court adjudges them to have committed a criminal offense. This is because it helps prevent crime by ensuring that the government does not have to wait for crimes to happen again, which makes law enforcement more effective.

6) The collection of DNA from the arrested person's body should be compulsory. It is a reasonable search and does not violate the right to the person’s body guaranteed to be protected under the constitutional amendment.

7) The offender should be allowed to collect their DNA or authorize government officials to collect DNA from a person's body. This exercise of power only slightly intrudes on a person's right to the body, such as pulling out hair or collecting tissue from a person's body. Cheekbones, etc., are to be imported into the criminal history database, comparable to storing fingerprints, compared with the state's benefits in maintaining national security and effectively enforcing the law. The state's interests outweigh DNA storage, which has little impact on a person's right to their body.

8) Consideration should be given to compulsory collection from people of all genders and ages, both from children and innocent people who have never committed a crime and do not use the principle of consent. It is collected from males more than females because they have more crime statistics.

9) The goal should be to collect citizens' DNA data to increase every year, along with developing storage formats, such as using technology for storage. Creating a data bank,

etc., makes it possible to store information for use in monitoring and controlling people in the country, which the people oppose.

10) DNA should be stored with consideration to individual rights and freedoms. The rules are careful and concise and do not hinder the performance of government officials. Furthermore, a video recording should always be used evidence while collecting DNA.

In terms of the national DNA database creation

Storing DNA in a national database should be given severe importance by setting criteria to be on par with those in other civilized countries and allocating sufficient budgets, personnel, locations, departments, etc., to carry out operations to achieve success within a clear time frame. It is in the best interest to store DNA in a database to be used for severe and concrete forensic evidence in criminal justice.

1) There should be a law at the level of an Act enacted explicitly to create a DNA database for forensic evidence in criminal justice.

2) A ministry-level agency should be the leading agency that is oversees the national DNA database centrally. The national DNA database in England is under the control of the National DNA Database Strategy Committee under the jurisdiction of the Ministry of Interior

3) The storage and destruction of DNA data should be classified into several groups with different conditions, such as storing DNA from innocent people. A person who has been convicted of an offense, A person who has been convicted of a light punishment for the first time, and juveniles commit crimes for which the court sentences them to imprisonment. People convicted of not committing a crime may only have their DNA profile stored for a serious offense, including suspects or people arrested for serious crimes. The principle of consent is used as a storage condition for storing DNA from innocent people.

4) The principle of consent should be applied to the indefinite DNA storage of offenders. Those freed from committing crimes Person whose legal action has been cancelled. Those who have been charged or arrested for violations are innocent for the benefit of the police being able to examine and compare if new offenses are committed. This can be considered as preventing crimes that may occur in the future.

5) There should be a law that requires DNA destruction upon request from a captive in some instances only.

6) Consideration should be given to the destruction of DNA data upon completion or within six months from the date of storage of the offender's DNA profile or can be kept

indefinitely and that the information of innocent persons be deleted after the conclusion of the investigation or the completion of the process.

7) Consideration should be given to specifying exceptions for temporary data retention, including cases where the first offense is light punishment, suspects, those arrested for serious offenses, those who have been warned for causing a nuisance, or those who commit crimes against national security. They must be kept without destruction for comparative examination if new offenses are committed. This can be considered as preventing crimes that may occur in the future.

8) The DNA database should be divided into three parts: local, regional, and central. Each database should have a storage room or laboratory to send collected specimens or collected data to the central agency. Responsible for creating DNA files and exchanging DNA information with each other to forward the information to different levels of databases, it makes it possible to systematically link data between each other, consisting of various data indexes for searching.

9) DNA should be stored in a database classified as an index to search and analyze DNA matches with criminal justice by studying the indexing of data from the United States or the People's Republic of China.

10) An index of information should allow government officials to access individuals' DNA patterns and investigate family relationships.

11) A ministry-level agency should be responsible for bringing DNA data into the database.

12) The central agency at the ministry level should supervise Creating a DNA database, accessing information, and searching for information, mainly following the law. Moreover, there are many agencies responsible for implementing the law working together, such as the Royal Thai Police. Police Hospitals under the Ministry of Public Health or private hospitals that are ready Institute of Forensic Science, Ministry of Justice, Ministry of Interior Office of the Attorney General or the Lawyers Council, etc., to provide rights to the people involved Stakeholders in the case or a person with authority to search for information for forensic evidence in criminal justice.

13) The forensic science laboratory, the Genetics Laboratory of the Institute of Forensic Sciences, should be established as the central unit for conducting DNA analysis.

14) A DNA database should be created that may preserved and not be destroyed.

15) There should be a law that requires the recording of evidence of every step of DNA entry into the database—from the storage process, sending specimens to the laboratory, submission of information to the DNA database, storage, destruction, etc., and recording consent documents for storing the accompanying DNA in the personal DNA database.

16) A specific agency should be established to monitor the chain of possession of DNA data if there is a dispute regarding the accuracy of personal DNA information.

2. The suggestion for the following study:

1) There should be a study on preparing national DNA data to store personal DNA data for all Thai citizens, similar to having an ID card and set criteria for accessing information or searching at various levels, considering individual rights and freedoms versus the state's interests in maintaining public security and safety.

2) The idea of invasive and non-invasive bodies from DNA storage should be studied from the general public's opinions.

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