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Public Perception of a Criminal DNA Database in Korea[1]

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Abstract

Background: Since 2010, Korea has maintained a DNA database of those convicted of or awaiting trial for certain crimes. There have been proposals to expand the list of crimes included in this database, or conversely, omit certain crimes if they are committed during protests. An understanding of the feelings of the public as we consider the ethical, legal, and social aspects of a DNA database and as revisions to laws are made is required.

Methodology: Questions related to the DNA database were included in the nationally representative Korean Academic Multimode Open Survey (KAMOS) panel (June-August 2016).

Results: Of 2,000 randomly selected panel members, 1,013 respondents participated in this survey, including 89.2% who supported the existence of a criminal DNA database. The current system of storing DNA profiles until a suspect's acquittal or a convict's death was supported by 79.5% of respondents. In addition, 70.8% of respondents agreed with the expansion of crime categories included in the criminal database. Many (93.4%) respondents favored genetic testing and data storage to determine the identity and cause of death for people who die of unnatural causes. Some differences in attitude related to social class were noted, with those who self-identified as members of the upper class more likely to support the database and its expansion to include additional crimes than those who self-identified as middle or lower class.

Conclusion: Our findings suggest that Koreans generally support the criminal DNA database.

Keywords: Criminal DNA database, Korea, KAMOS, public opinion

Background

In 2010, the Act on Use and Protection of DNA Identification Information went into effect in Korea, allowing for the creation of a criminal DNA database that could be used in criminal investigations. Throughout the world, countries and states have created similar databases, beginning with the creation of the National DNA Database (NDNAD) in the UK in 1995. As of a 2008 INTERPOL report, 54 countries had already created such a database to use for criminal investigations, and an additional 26 countries planned to institute one. Since then, it has been confirmed that a DNA database is beneficial as a tool for fighting and preventing crime. In the USA, for example, DNA databases have been shown to deter criminals whose information is in the system from committing another crime. They also reduce crime rates over all (Doleac, 2017).

The Act on Use and Protection of DNA Identification Information in Korea provides strict guidelines regulating the use of this database. Articles 5 and 6 of this Act allow, respectively, for the collection of DNA from those convicted of or confined while awaiting trial for certain crimes, namely, arson, murder, acts intended to cause injury, drug related offenses, rape/sexual assault and related offenses, sexual violence against a juvenile or child, robbery/extortion and related offenses, burglary, abduction/kidnapping, and fraud-related offenses.

According to articles 12 and 13, DNA material should be destroyed after the DNA profile is recorded in the database. This regulation may be problematic from a scientific perspective. However, during the legalization process, concerns about the abuse or misuse of DNA material and information were expressed by both the public and experts (Cho, 2004). These concerns were reflected in the Act, which shows that public concerns play an important role in making laws. Furthermore, the destruction of the samples themselves is in line with the practices of other countries (Wallace, Jackson, Gruber, & Thibedeau, 2014).

DNA information is kept in the database until a convict's death or a suspect's acquittal. The 2008 Marper decision by the European Court of Human Rights ended this extended storage of DNA profiles in the UK and throughout Europe (Wallace et al.,

2014). Furthermore, there has been some evidence that more expansive (i.e., with more people included due to longer retention periods and/or additional crimes causing people to be included) does not make a difference in matches found (Santos, Machado & Silva, 2013). Therefore, it may be necessary to reconsider the length of storage of DNA profiles in the Korean database.

Controversies Concerning the Database in Korea

Cases related to the criminal DNA database have been presented to the Korean Constitutional Court. In 2009, there was a protest against the forced demolishment of the Yongsan area of Seoul. Protestors believed that older buildings should be preserved and therefore blocked construction workers. Demonstrators and riot police had a violent confrontation, which included a large fire. After the protest, some demonstrators were required to submit their DNA samples on suspicion of assault and arson. They objected to the requirement because they thought that it did not correspond to the purpose of the Act, which they argued was to reduce and investigate violent crimes against citizens. However, in the Yongsan Redevelopment case, the Constitutional Court adjudicated in 2014 that including these protestors' DNA in the database was constitutional.

In another case, the Guro Street Vendor case, some street vendors protested in a shopping mall in 2013. They were charged with trespassing and obstruction of business. Four years after the protest, prosecutors collected DNA samples from them. These street vendors and related groups claimed that some crimes, such as burglary or property damage, should not be considered to be violent crimes for the purpose of inclusion in the DNA database.

Some civic groups argue that crimes committed during these kinds of protests should be regarded differently from crimes committed under other circumstances. Some constitutional court judges who participated in the judgment of 2014 have already presented a minority opinion that recidivism of offenders should be clearly determined before collecting DNA data and that the exclusion of data obtained from those who have not committed a crime for a long period of time should be considered.

With these controversies in mind, this paper investigates the public attitudes toward the current DNA database law in Korea in anticipation of and preparation for eventual revisions to this law. Public opinion is one important factor to consider when making laws that are acceptable to any society. For example, Voultsos, Njau, Tairis, Psaroulis, and Kovatsi (2011), writing about changes in Greek law expanding the DNA database in Greece, discuss the importance of receiving community input and considering different social groups' opinions prior to enacting new laws to increase public trust, as did Gamero, Romero, Peralta, Carvalho, and Corte-Real (2007), when writing about Spain. As already mentioned, a series of surveys was conducted in Korea prior to the Act creating a database as part of a larger ethical, legal, and society project related to biotechnology (Cho, 2004); however, to the best of our knowledge, no scientific surveys have been conducted in Korea since the implementation of the database until now.

Our main research question asks under what circumstances Koreans support the collection of DNA for a criminal DNA database. We consider whether any demographic variables are related to support of this database. An important thing to consider when enacting or revising laws, or trying to implement any system, is the situation of the society in which the law or system is implemented. The circumstances of a society cannot be discussed separately from the perception of its people. The various dynamics and interplay between social experiences and attitudes related to risk perception or technology acceptance have been discussed by others (e.g., Clothier, Greer, Greer, & Mehta, 2015; Otway & Winterfeld, 1982). An analysis of which Koreans tend to support the DNA database will enable us to identify which social experiences may be influencing public acceptance of this relatively new use of technology. As ours is a law enforcement issue as well as an issue of technology acceptance, there may be some additional issues to explore that would not be present when considering the acceptance of other technology.

In addition, given the controversies mentioned above, we hypothesized that Koreans will have a nuanced view of the database, supporting it generally, while not supporting it in certain cases. The questions included in our survey are meant to probe Koreans' attitudes toward the current database, their willingness to expand the

database to include other crimes, their willingness to limit the database when a crime is committed during a protest, and their willingness to explore other uses of a DNA database, such as identifying bodies.

Methodology

To assess public opinion about the maintenance of a national DNA database in Korea and other issues related to forensic science, we asked ten questions about forensic science on the Korean Academic Multimode Open Survey for Social Sciences (KAMOS), five of which were directly related to the criminal DNA database and are discussed below. Demographic variables were also collected as part of the survey. The complete Korean and translated questionnaire and data is available online (Chun et al., 2017).

KAMOS is an omnibus panel survey (with a core question component) conducted regularly in Korea. Panel members were initially recruited in a face-to-face survey conducted February-May 2016 using the same two-stage stratified cluster sampling method that is used in official government statistics.

Our questions were included on the survey conducted June-August 2016. Two thousand panel members were randomly invited to participate in this survey. The response rate was 50.65%, that is, 1,013 people responded. Most of those participants responded online (90.4%); some (i.e., panel members who prefer not to take surveys online) responded via telephone interview (9.6%). The demographic information about the participants and a more detailed analysis of this panel suggest that it is representative of the Korean population (Cho, LoCascio, Lee, Jang, & Lee, 2017). The respondents were 49.7% male and 50.3% female. The age and other demographic information of participants is shown in Table 1 and accurately reflects the Korean adult population.

Table 1. Information about Respondents (N=1,013)

Profile		N	%
Gender	Male	503	49.7
	Female	510	50.3
Age	18~29	191	18.9
	30-39	180	17.8
	40-49	210	20.7
	50-59	199	19.6
	60 and higher	233	23.0
Region	Seoul	207	20.5
	Incheon/Gyeonggi	301	29.7
	Daejeon/Chungcheong	106	10.4
	Gwangju/Jeolla	101	10.0
	Daegu/N. Gyeongsang	106	10.5
	Busan/Ulsan/S.Gyeongsang	148	14.6
	Gangwon/Jeju	43	4.3
Education Level	Middle school	106	10.4
	High school	351	34.7
	College/university	556	54.9
Employment	Agriculture/forestry/fishing	33	3.3
	Private business	169	16.7
	Blue collar worker	173	17.1
	Office staff	309	30.5
	Homemaker	183	18.1
	Student	104	10.3
	Unemployed/other	42	4.1
Marital status	Single	222	22.0
	Married	744	73.5
	Divorced/widowed	46	4.6
Monthly Income	Below 3 million won	261	25.8
	3-5 million won	474	46.8
	Above 5 million won	278	27.5
Perceived standard of living	High class	68	6.8
	Middle class	547	54.0
	Low class	397	39.2

In addition to asking about monthly income levels, respondents were also asked to report their self-perceived social class, which may or may not reflect their actual income. Other demographic information collected included geographic region of residence, city size (large metropolitan area, medium-sized city, or rural area), geographic region of hometown, education, type of employment, marital status, household size, religion, and residence type (single family house, apartment, multipurpose apartment/efficiency, multiplex house, other). The analysis was conducted by applying the Chi-square test using IBM-SPSS Statistics ver 23.

Results

Maintaining a Genetic Database of Criminals

A strong majority of Koreans (89.2%) support the current practice of maintaining a DNA database of those convicted of certain crimes, as well as of suspects who are confined and awaiting trial for certain crimes.

Those who supported the database were asked why. Respondents could choose as many of the four suggested reasons as applied or list another reason. The most popular reasons given for supporting this database were that it could help catch criminals (80.2%) and could help prevent crime (74.3%). Less popular reasons include that it would not cause much harm to those whose information was included (9.8%) and that the Constitutional Court already approved it (8.7%).

Of the 102 respondents who did not support the use of this database, the reasons for disagreeing included a fear that those whose genetic information is stored in the database may be investigated for unrelated crimes (53.3%), that the database infringes on an individual's freedom to his body and personal information (50.6%), that the wrong person could be suspected because of an error made in a DNA test (40.8%), and that people can be investigated for a crime for being a close relative to those whose information is stored in the database (28.9%).

While the majority of respondents support the use of this database and most demographic variables were not related to this opinion, there were some differences

in opinion based on perceived class. Those who identified themselves as members of the upper class were more likely to strongly agree with the system (71.1%) compared to those who self-identified as members of the middle (55.0%) or lower (48.1%) class (Chi-square=27.3, df = 6, p<0.0001, see Table 2).

Table 2. Korea currently collects DNA information from convicts and confined suspects and maintains a DNA database. What is your opinion of this system?

Response category		Perceived Class (%)			Total
		Upper Class (%)	Middle Class (%)	Lower Class (%)	
1	Strongly Agree	71.1	55	48.1	53.4
2	Somewhat Agree	17.4	35.1	39.9	35.8
3	Somewhat Disagree	3.1	6.9	9.5	7.6
4	Strongly Disagree	7.1	2.4	1.6	2.4
5	No opinion	1.2	0.6	1	0.8
1+2 combined	Agree	88.5	90.1	87.9	89.2
3+4 combined	Disagree	10.3	9.2	11.1	10.0
N		68	547	397	1013

Expanding/Narrowing the Database

A majority (70.8%) of Koreans support expanding the number of crimes that would cause perpetrators' DNA to be added to the database, thereby including those who committed relatively light crimes. However, this agreement was not as strong. Only 30.3% strongly agreed with this, while 40.5% somewhat agreed with it and 20.4% somewhat disagreed.

Those who perceived themselves as upper class were more likely (77.5%) to agree with expanding the list of included crimes than those who perceived themselves as lower class (66.0%). Upper class people were also more likely to strongly agree with this expansion (49.2%) than lower class people (26.8%) (Chi

square =21.9, df=6, p=0.001, see Table 3).

Table 3. People Who Support the Expansion of the Crimes Included in the Database Q. Currently, about 10 criminal offenses (violent crime) are subject to DNA database entry. Do you agree or disagree with expanding the limit by including relatively light criminal offenses? (Current violent crimes that are subject to DNA testing are limited to those committed the following: arson, murder, acts intended to cause injury, drug related offenses, rape/sexual assault and related offenses, sexual violence against juvenile or child, robbery/extortion and related offenses, burglary, abduction/kidnapping, fraud-related offenses)

Response category		Perceived Class			Total
		Upper Class (%)	Middle Class (%)	Lower Class (%)	
1	Strongly Agree	49.2	30.4	26.8	53.4
2	Somewhat Agree	28.3	42.6	39.7	35.8
3	Somewhat Disagree	17.1	17.4	25.2	7.6
4	Strongly Disagree	5.4	9.3	7.8	2.4
5	No opinion	0.0	0.3	0.5	0.8
1+2 combined	Agree	77.5	73.0	66.0	89.2
3+4 combined	Disagree	22.5	26.7	33.0	10.0
	N	68	547	397	1013

Most (79.5%) Koreans support the current law, which allows for DNA to be stored until a suspect's acquittal or a convict's death. Some (19.1%) thought that it would be better to reduce the amount of time that this information is kept in the database (see Table 4).

Table 4. Currently, our law states that DNA information is kept and used until the acquittal of the accused or death of the convict. What is your opinion?

	Response category	Total
1	Should maintain the current law	79.5%
2	Should reduce the period	19.1%
3	Don't know/No answer	1.4%
	N	1013

Our survey also touched on other law enforcement uses of a DNA database. A DNA database can be useful in identifying deceased John/Jane Does. An even stronger majority of Koreans (93.4%) support this use of a genetic database, with 50.4% strongly agreeing and 43.0% somewhat agreeing. Less than 1% (0.9%) strongly disagree with this use of a genetic database. While this use of a database is supported by Koreans, it should not be taken for granted; as a comparison, only 71.7% of the Spanish public supported this use of a DNA database (Gamero et al., 2007).

As discussed above, some have suggested that those who commit crimes while protesting a demolition for redevelopment or a clearing out of street vendors should be exempt from submitting their DNA to the criminal DNA database. A majority of Koreans (70.2%) felt that there should be an exception in at least one of the cases, with nearly half (49.2%) saying it is best to have exemptions for both of these kinds of protests (see Table 5). These results support our hypothesis that Koreans have a nuanced view of the database, supporting it generally, but making exceptions in some cases.

Table 5. During the course of protesting a demolition for redevelopment or clearing out street vendors, protestors might commit battery, break into a house, cause property damage, etc. Do you agree or disagree with excluding these offenses from the DNA database?

	Response category	Total
1	It's best to exclude in both these cases.	49.2
2	It's best to exclude these only for offenses committed during a protest of demolition for redevelopment.	11.8
3	It's best to exclude these only for offenses committed during a protest of clearing out street vendors.	9.2
4	It's best not to exclude these.	27.7
5	Don't Know/No answer	2
1+2+3	Combined Support of Exclusion	70.2
	N	1013

Discussion

Differences in Opinion Based on Time (2003 vs. 2016) and Place (Korea vs. Portugal)

More Koreans seem to support maintaining and using a genetic database (89.2%) for criminal investigations today compared to 71.3% who supported using a genetic database to investigate a crime according to 2003 telephone survey (Cho, 2004). Both surveys can be assumed to have the margin of error of ± 3.1% on the condition that those surveys didn't have bias. So, the difference of 16.9 percentage points is statistically significant. In interpreting this difference in attitude, it is important to note a few potential limitations. First, some of the questions were a little

different, as discussed below. In addition, the survey methodology was different. The 2016 survey follows a more rigorous sampling method; it is a highly scientific and representative survey. The 2003 survey was conducted of 1,200 adults representing Korean population in terms of gender, age, and residential area. It allowed for the replacement of selected respondents who could not be reached or refused to participate; the 2016 survey used a random sample of a probability-based panel and did not allow for the replacement of any selected respondents. While the sampling method used today is more rigorous, the earlier survey approximates the Korean population closely enough that it is worth comparing these two surveys to give us some sense of how the opinions of Koreans have changed over the past 13 years.

It is important to note that, in the 2003 survey, more people said that they did not know or had no opinion (10.9%) compared to the 2016 survey (0.8%). The decrease in no opinion may be due to an increased awareness of this kind of database. The media discusses the DNA database directly, for example, by reporting that the police solved 4,400 cases during the first five years after implementing the DNA database, as well as news mentioning a positive aspect of the DNA database every time an old cold case was solved. In addition, the same time frame saw a rise in crime procedural dramas, like CSI, which may also have increased awareness and so reduced the number of respondents who had no opinion. So, the increase in people supporting this use of a genetic database may be due in part to an increase in people having sufficient knowledge to form an opinion. While there may have also been a shift in opinion among people who disagreed with this use of a database, there was only a difference of 7.9 percentage points in those who disagreed.

Some of the difference we see between the Korean survey of 2003 and the one from 2016 may be due to the database changing from a hypothetical idea to a reality; it may be easier to support an already established criminal DNA database that has already been approved by the Constitutional Court than to support the creation of a database for this purpose without knowing about its details. The questions from the surveys may also not be perfectly comparable. In the 2003 survey, respondents were asked about a hypothetical database of all Koreans, whereas in 2016, they were asked about a database that only included convicted or accused criminals. It is likely,

therefore, that most respondents to the 2016 survey were answering about a database that they would never expect to be included in, while the 2003 respondents would have expected to be included in the database. It may be easier for some people to support the use of a database of "others," than to support one that would include their own personal information.

Still, assuming that the respondents to the 2003 survey believed their own DNA profiles would be included in the database, we saw more support from Koreans for this kind of comprehensive database than from some other countries today. For example, a survey from Portugal asked people if they would be willing for their DNA to be included in a database; only 46.5% would and 23.2% would refuse (Machado & Silva, 2014). Similarly, only 35% of Italian students would be willing to be included in such a database and 14.5% would refuse (Tozzo, Fassina, Caenazzo, 2017). In a survey at a medical school in Egypt, 34.6% of respondents felt that all Egyptian individuals should be included in a new database (Ibrahim & Ali, 2017).

Our explanation for the difference in Korea between 2003 and 2016 being due in part to people's expectation of being included in the database is further supported by the fact that 28.9% of respondents to the 2016 survey said that they disagreed with expanding the criminal database so that perpetrators of lighter crimes would be included; if these people did not support the expansion of the criminal database to include additional criminals, it is extremely likely that they would not support a database that included all citizens, which the 2003 survey suggested (Cho, 2004).

Class Differences

One hypothesis for the difference in attitude based on perceived social class is that members of the upper class are more likely to perceive criminals as an "other" and not see the database as potentially negatively affecting them or their associates, while the criminal genetic database feels more personal to members of the lower class. Those who perceive themselves to be upper class may imagine that they are not likely to be charged with any crime, and if they are, they may be more likely to be acquitted. Like in many other countries, the best lawyers, that is, the ones most likely to get an acquittal for their clients, are generally paid more. Members of the upper

class may be in a better position to afford such lawyers and may therefore expect that they are unlikely to be convicted of a crime. Conversely, members of the lower class are more likely to be convicted of a crime or personally know someone who has been, and therefore may be more hesitant to support the use or expansion of such a database (Oh, 2016). A similar phenomenon was found in the US: Duster suggests that African Americans and Latinos in the poorest neighborhoods of large American cities may be more likely to distrust DNA results in criminal proceedings because these groups have historically been the most likely to have been framed for crimes by corrupt police officers (Duster, 2006). More research is needed to determine whether this is a concern among the self-identified members of Korea's lower class, and if so, whether it is a valid concern and how it can be addressed.

Conclusion

In conclusion, there are several factors involved in the controversies surrounding the criminal DNA database, including personal liberty and privacy, crime prevention, judicial justice, and public security. It can be summarized as a conflict between the individual and the society. When it comes to managing a DNA database legally, what experts in Korea considered was the issue of which crimes to target and how to proceed. These considerations ultimately focus on protecting the privacy of individuals and the effectiveness of criminal investigations.

In general, our findings suggest that Koreans place a higher value on crime prevention (74.3% of those who support the database cite that as a reason) and judicial justice (80.2% of database supporters cite arresting criminals as a reason for supporting the database) than individual rights, such as privacy protection, which was only a concern for about half of the non-supporters. However, there were some nuances in these results. While the majority of Koreans support the current DNA database and its expansion, they also seem to value their right to protest without being regarded as criminals, and hence also support the exclusion of the DNA of those who commit crimes during the course of a protest. We also noted that social class played a role in people's attitudes toward the DNA database, with those who

perceived themselves as lower class being the least supportive and those who perceived themselves as upper class being the most supportive. This may suggest that there may be a perceived (whether real or imagined) difference in the way people of different social classes are treated by the justice system.

While the justice system strives to treat all people equally and fairly, its success in that regard may be an area for future research. This paper is expected to be used as a barometer of public awareness in the revision of relevant laws on DNA databases.

In further studies, the management and neutrality of the criminal DNA database should be investigated. Monitoring of the trends of public opinion in this area should also continue. Continued cross-cultural comparisons of public opinions from different countries or communities are also needed to help form international best practices. A consideration of the effect of media use on attitudes toward the DNA database in Korea is another area of future research.

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