

THE POLICE NATIONAL DNA DATABASE: Human rights and privacy



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The police National DNA Database is the largest DNA database in the world. It contains DNA profiles from more than 2.5 million individuals¹ and is expected to double in number over the next few years.² The database includes information on people convicted of a wide range of crimes, including serious violent crimes and minor public order offences, as well as many people who have never been convicted or charged with any criminal offence.

The DNA Database is an important tool for criminal investigations and brings major benefits – including helping to identify some murderers and rapists. However some existing practices raise human rights and privacy concerns including:

- retaining DNA samples, rather than just the DNA profiles used for identification;
- using the Database for genetic research without consent;
- retaining people's records permanently on the Database regardless of the nature of their offence;
- including people permanently on the Database who have been arrested but not charged, or who have been acquitted.

New technologies and policies are also beginning to raise privacy issues. This briefing describes the National DNA Database, its role in tackling crime, and the need to balance crime detection, human rights and privacy. It asks whether better safeguards could be introduced without compromising the role of the Database in tackling crime.

What is the National DNA Database?

The National DNA Database (NDNAD) was established in 1995. It contains DNA profiles and other information from individuals and (FSS) for the Association of Chief Police Officers (ACPO). This briefing focuses on the

NDNAD in England and Wales. Scotland has its own DNA database and its laws are different. However, DNA profiles added to the Scottish database are also added to the National DNA Database.¹ DNA profiles from Northern Ireland are not yet routinely added to the NDNAD, but this is expected to begin soon.³

Box 1: Records on the National DNA Database

Each 'criminal justice' (CJ) record for an individual on the Database contains the following information:

- a unique barcode reference number (giving a link to the stored DNA sample);
- an Arrest Summons Number (providing a link to the record on the Police National Computer, containing people's criminal records and police intelligence information);
- the person's name, date of birth, ethnic appearance (as identified by a police officer) and their sex;
- information about the police force that collected the sample;
- the sample type (blood, semen, saliva, etc.)
- the test type
- the DNA profile.

Records for DNA profiles taken from scene of crime (SOC) samples, contain information about the crime, rather than the (unknown) individual.

DNA can now be obtained from any sample of human tissue left at the scene of a crime, including samples of blood and semen, or saliva on a cigarette butt or drinking glass. Crime scene examiners (employed by the police) send DNA samples to the FSS or to a commercial laboratory to obtain a DNA profile, which is then entered on the

Database by the FSS. These DNA profiles are a string of numbers based on specific areas of the DNA, known as short tandem repeats (STRs). To try to find out who the DNA came from, the police can:

- arrest known suspects for the crime and take their DNA samples for profiling. These DNA profiles are used to find out if one of them matches the crime scene profile. Whether there is a match or not, the profiles are kept permanently on the Database;
- ask everyone in a particular area or workplace to give a DNA sample to try to find a match (a 'mass screen'). These 'elimination' profiles are usually destroyed but people can also agree to have them entered permanently on the Database;
- ask the FSS to compare the crime scene DNA profile with all the profiles on the National DNA Database to try to find a match (known as a 'speculative search'). These searches are now done routinely every night. In a few cases, the FSS can also look for a *partial* match that may identify a relative of the suspect ('familial searching');
- go to court and ask for permission to search other DNA databases (for example, DNA collected for health research) if they can convince the court that this is in the public interest. This method has not been used but could be in the future;
- use new techniques to see if the genetic information in the DNA sample can give some clues about the person they are looking for, such as their hair or skin colour.

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The police now routinely take DNA samples from anyone arrested for any 'recordable' crime, even if the sample is not relevant to the crime being investigated. Putting DNA profiles from these samples on the Database allows the FSS to check whether there is a match between the arrested individual's DNA and a DNA profile from any previous crime scene. These individuals are kept on the Database for life and their profiles are automatically checked against DNA profiles obtained from any future crime scene.

The purpose of the Database is to increase the chances of finding a match between a crime scene DNA sample and a named individual, even when there is no known group of suspects for a crime. These matches are never used in court, but they provide the police with 'intelligence information' about who is likely to have been at the crime scene. Further police work can then obtain the corroborating evidence (such as witness statements) that is needed to obtain a conviction, and a fresh DNA sample from the suspect is then tested to confirm the match for use in evidence in court.

Detecting and reducing crime

There is no doubt that DNA evidence can improve crime detection and conviction and thus benefit society. The Database is particularly effective in improving detection rates for burglary and theft from vehicles. However, DNA profiles are obtained from the examination of less than 1% of crime scenes. As a result, in 2002/03 only 1.6% of all crime detections were attributed to DNA Database matches by the Home Office (0.3% of all detections for violent and sexual offences, 7.9% of all detections for vehicle thefts and 8.3% of all detections in cases of domestic burglary).³

In addition, it is important to remember that the number of Database detections overestimates the number of detections that *required* the Database by an unknown amount depending on the type of crime.

This is partly because not all detections lead to convictions and partly because the suspect may already have been known or identifiable without use of the Database (for example, rapists and murderers are often known to their victims, so their DNA could be compared directly with a crime scene profile). The lack of a full assessment of effectiveness means that there is some uncertainty about the cost-effectiveness of expanding the Database, compared to alternative approaches to tackling crime. It also makes it hard to balance the benefits against the threats to privacy and rights.

Privacy, human rights and discrimination

Few people have problems with the idea of the police comparing the DNA of a suspect with DNA left at the scene of a serious crime. However, concerns arise when DNA profiles and other information are stored permanently on a database, especially when the database includes large numbers of innocent people. The three main areas of concern about the NDNAD are: its impacts on people's privacy; the potential for misuse by governments; and whether it discriminates against certain groups of people (especially ethnic minorities).

DNA is very different from other types of forensic data because it has the potential to reveal a lot more information about a person.⁵ Unlike a fingerprint, DNA can:

- reveal who a person is related to – if your DNA profile is held on the NDNAD it could be used to trace your brothers, sisters, parents or children;
- potentially provide some hints about what a person looks like;
- potentially indicate whether a person is at *risk* of developing an illness in the future or has a rare genetic condition.

The DNA *profiles* held on the Database can be used to investigate who a person is related to (including non-paternity), but are unlikely to contain personal genetic information about health or other characteristics. This is because they are based on 'non-coding' parts of DNA (not on genes). This part of a person's DNA is not thought to be important in influencing biological differences such as health or appearance. However, the DNA *samples* which remain permanently linked to the Database contain unlimited amounts of genetic information, increasing privacy concerns.

Because DNA is a powerful tool to trace individuals, the National DNA Database could also be used as an instrument of surveillance, raising fears about the potential to create a future 'police state'. Even if DNA profiles were not included, there are concerns about misuse because the Database now contains the first permanent list of anyone who has been arrested since April 2004. Expanding the Database puts increasing numbers of people on this 'list of suspects', even though they may never have been charged or convicted of a crime. This may subtly alter the way they are viewed both by the state and by their fellow citizens, potentially undermining the principles of 'innocent until proven guilty' and of rehabilitation. One issue is whether permanent records of arrest could be used in future to restrict people's rights and freedoms, for example to make it difficult for them to obtain travel visas or employment.

The Database is also inevitably discriminatory because some people are included on it while others are not. A temporary removal of some rights is widely agreed to be a reasonable punishment for committing a serious crime. But many people on the database have not committed any crime and some have committed relatively minor crimes. Allowing people to be entered and kept on the database for life when they have been arrested but not charged, or have been acquitted, may also exacerbate discrimination against certain groups of people, particularly ethnic minorities. The balance between these concerns and the benefits of using the DNA Database in

The three main areas of concern about the NDNAD are: its impacts on people's privacy; the potential for misuse by governments; and whether it discriminates against certain groups of people (especially ethnic minorities)

criminal investigations depends on who is on the Database and for how long; what information is kept on it or linked to it (including whether the original DNA samples should be retained); and what safeguards are in place to prevent misuse.

Who oversees the Database?

The National DNA Database Board oversees the Database and makes decisions about how it can be used. Its members represent the police, the Home Office, the FSS and the Human Genetics Commission (a government advisory body). The Custodian, an employee of the FSS, is responsible for day-to-day running of the Database, including quality assurance.

These arrangements are likely to change because the Government is planning to partially privatise the FSS.⁶ However, reviews by the Royal Commission in 1993,⁷ both the House of Lords⁸ and House of Commons⁶ Science and Technology Committees (in 2001 and 2005) and the Human Genetics Commission (in 2002)⁵ have concluded that the Database needs an independent advisory body that includes lay membership.

Companies supplying DNA profiles to the Database are paid an annual fee to store the samples, so it is in their commercial interests to argue that the samples should be retained. They may also wish to use the samples for research

Should the DNA samples be kept?

As well as storing the DNA profile obtained from analysis of the sample on the Database, part of the DNA sample is also retained indefinitely, linked to an individual's record on the NDNAD via a unique barcode reference number. Storing samples from crime scenes makes sense, so that the profile can be checked if necessary. However, the stored samples from individuals are not needed to prevent miscarriages of justice, because a fresh DNA sample is always taken from the defendant if a case comes to trial.

Companies supplying DNA profiles to the Database are paid an annual fee to store the samples, so it is in their commercial interests to argue that the samples should be retained. They may also wish to use the samples for research (see below). However, DNA samples contain sensitive genetic information not needed for identification purposes. Therefore, the permanent storage of DNA samples from individuals significantly increases privacy concerns.⁹

The National DNA Database Board argues that the samples must be kept for quality control and to check errors.¹ However, samples do not need to be kept *permanently* for the profiles to be checked; they could be stored only for a limited time period, until an investigation is complete. The Board also argues that keeping samples allows the Database to be upgraded to use more detailed profiles in the future. Although this was necessary when the Database was first set up, it is likely to be costly and impracticable now the Database is so large. Changing the profiling system would also make the Database incompatible with others internationally. An alternative is that if more detailed profiling were needed to prevent miscarriages of justice, this could be used for crime scene samples and the fresh sample that is always taken from a defendant for use in court, but not for all the profiles on the database.

The Government's advisory body, the Human Genetics Commission, concluded that the reasons given for retaining samples are 'not compelling'⁵ and the Home Office has recognised that retaining DNA samples is 'one of the most sensitive issues to the wider public'.¹⁰ However, the Government has no plans to change this practice. Destroying individuals' DNA samples after their profiles have been obtained would improve privacy protection and remove concerns that the samples might be used in future to reveal personal genetic information (such as health-related information) or be used for purposes other than identification (such as controversial genetic research).

Should genetic research be allowed without consent?

Because DNA samples are collected without consent, genetic research using the samples and/or Database can bypass the usual ethical safeguards. Neither the usual requirement to seek informed consent from participants, nor any independent ethical review of research proposals currently takes place. Research using the Database is supposed to be restricted to the purpose of detecting or reducing crime; however, this has been interpreted broadly to include research on predicting characteristics such as ethnicity from DNA. There is nothing to prevent future research including controversial topics such as searching for 'genes for criminality'.

Neither the usual requirement to seek informed consent from participants, nor any independent ethical review of research proposals currently takes place

Table 1 shows the numbers of approved research proposals for the NDNAD between 1995 and 2005. It remains unclear whether researchers have used the DNA samples (which contain unlimited amounts of genetic information), or only the DNA Database and profiles. The number of research projects appears to be increasing rapidly since March 2004 when the Home Office minister Hazel Blears stated that only five research proposals had been submitted: two had been approved, two rejected and one was pending a decision.¹¹ The two approved projects were both conducted by the FSS and both related to 'identification of individuals on ethnic or familial basis'. One of these research projects is a controversial attempt to use DNA profiles to predict ethnicity,¹² but the details of the other projects are not publicly available.

Table 1: Research requests to the NDNAD Custodian⁶

From	Received	Agreed
External research request from universities, etc.	6	1
Police operational requests relating to specific investigations, including familial searching	4	2
Requests to assist forensic providers for R&D papers, for future use in cases not specific investigations	11	6
Database improvements	1	1

The NDNAD Board claims that it is now discussing ethical oversight of research proposals with the Central Office of Research Ethics Committees (COREC).^{1,13} The COREC has denied this,¹⁴ however it now seems likely that a new ethics committee will be set up. In any case, approval by an ethics committee is not normally considered sufficient to override the right of individuals to consent or refuse to take part in research.

Genetic research using the Database is likely to be misleading as well as controversial

Genetic research using the Database is likely to be misleading as well as controversial. Categories in the NDNAD such as 'ethnic appearance' are meaningless for scientific purposes and the DNA profiles and samples will not be representative of either the general or the 'criminal' population. Research should be restricted to producing 'quality control' statistics on the type of data that has been added and how it is being used.

New technologies and techniques

The current DNA profiles used for identification purposes contain very limited information about a person's genes, but new techniques are being developed that

could change this. Researchers are now looking at predicting ethnicity, appearance and health status from DNA. Some even believe it will be possible to predict a person's personality or behaviour. However, there are serious scientific problems with most of these approaches and they are unlikely to produce particularly useful or accurate predictions in most cases.¹⁵ Nevertheless, a few genetic tests can reveal important information about some people's health. If use of this new technology (called SNP profiling) were expanded to stored samples from known individuals on the Database, the increase in police access to genetic information would raise major privacy concerns. Although upgrading all the profiles on the Database to SNPs seems unnecessary and unlikely, the FSS cites this possibility as one reason why it wishes to keep the samples.¹⁶

Because genetic tests are not regulated, the police are dependent on advice from commercial companies about what the tests reveal

A more immediate problem is the use of these new genetic tests to analyse DNA samples from crime scenes. Commercial tests are now available which claim to predict the genetic heritage or ancestry of a potential suspect from their DNA (using categories such as Sub-Saharan African and Indo-European). Because genetic tests are not regulated, the police are dependent on advice from commercial companies about what the tests reveal. However, test results for ancestry may be misleading,¹⁷ and even the genetics of predicting eye, skin or hair colour is complex and still poorly understood.¹⁸ In addition, the police may misinterpret the information they are given, as happened recently with one test claiming to indicate that a suspected rapist was of Caribbean origin.¹⁹ Without better oversight, there is a danger that the information will be used selectively to reinforce existing prejudices, for example about race or skin colour.

The use of 'familial searching' (using the Database to try to identify the relatives of a potential suspect) is also expected to increase. There is a risk this may uncover family relationships that people do not know about, including cases of non-paternity. However, as yet there are no published guidelines as to when such an approach can be considered ethical. As the House of Commons Science and Technology Committee recognised, there is a need for a system to oversee the regulation of new forensic technologies.⁶

Who should be on the Database?

The original aim of the Home Office's DNA Expansion Programme, announced in April 2000, was to include 'virtually the entire active criminal population' (an estimated 3 million people) on the Database by 2004,²⁰ raising questions about how the 'active criminal population' is defined. Expansion of the Database continues and new legislation came into force in England and Wales in April 2004 allowing DNA samples to be taken from anyone who is arrested on suspicion of any 'recordable' offence. Most driving offences are not recordable but most other offences are, including being drunk in a public place, begging or taking part in a prohibited public procession.²¹ Both the DNA samples and the profiles are now kept for life, even if the person arrested is never charged or is acquitted.

Children's samples and profiles are also kept permanently. In the UK, 3.7% of the population are now on the DNA Database, compared to 0.57% of the population in the European Union and 0.48% in the USA.²²

Some people are more likely to end up on the Database than others: for example, 98% of individuals' profiles are from men and only 2% from women. To some extent this reflects differences in crime rates in different parts of the population. However, discriminatory policing could lead to a disproportionate number of people from ethnic minority groups being arrested. And police powers can be abused (for example, to collect surveillance information on protesters, or to arrest people simply to get hold of a DNA sample). These concerns have been exacerbated by the new law, which allows samples to be taken as a matter of routine before someone is charged, even if a DNA profile is not relevant to the offence for which they are arrested.

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The NDNAD Board reports the breakdown of male profiles on the Database as: white skinned European (82%), dark skinned European (2%), Asian (5%), Arab (1%), Afro-Caribbean (7%), other (3%). Because black males make up only a small proportion of the UK population, *New Scientist* magazine has calculated that the NDNAD contains DNA profiles from nearly one-third of black adult men, compared to only 8% of white adult men.²³ Understandably, these figures raise concerns within the black community.²⁴

Time limits on data retention on the National DNA Database could provide an important safeguard

Some forensic scientists have argued that, to prevent discrimination, the Database should be expanded to include the whole UK population, although the Association of Chief Police Officers (ACPO) regards this as too expensive and impracticable.¹ Putting everyone on the Database would not necessarily prevent it being used in a discriminatory way and would significantly increase concerns about excessive state surveillance. An alternative would be to change the data retention policy, perhaps to mirror that used on the Police National Computer (PNC), which stores people's criminal records. PNC records for convicted murderers and rapists are kept permanently, but many other records are supposed to be removed after fixed time periods.²⁵ Some records can be kept after acquittal: but only in restricted circumstances (mainly relating to sexual offences, on public protection grounds). Time limits on data retention on the National DNA Database could provide an important safeguard for privacy and human rights, limiting the potential for misuse by future governments.

Links with other databases?

Other national databases are being planned and developed, including the National Identity Register to support the use of ID cards, and the new NHS Electronic Care Record Service, which may contain some genetic data in the future. It is not clear under what circumstances the police will be allowed access to this information, nor whether any of these databases will be linked – for example, by including a person's Arrest Summons Number and NHS number on the proposed National Identity Register.²⁶ Expanding and/or linking these databases would give the state unprecedented abilities to monitor the UK population. This is a particular concern because, since April 2004, everyone with an Arrest Summons Number will remain permanently listed on the DNA Database even if they are never charged or are acquitted.

There is no such thing as an error-free database. Mistakes can lead to 'false positives' where an innocent person is wrongly identified

Errors in DNA profiling

There is no such thing as an error-free database. Mistakes can lead to 'false positives' where an innocent person is wrongly identified. In some cases DNA evidence can be difficult to interpret, particularly when samples from the crime scene are degraded or contain more than one person's DNA. Even though a 'trawl of the database' is not enough to secure a conviction in court, the criminal justice system may not always take sufficient account of the possibility of errors and people may be wrongly convicted either by mistake or even by being 'framed'.

The NDNAD Board recently estimated that some 26% of matches obtained using the old DNA profiling system could have occurred simply by chance.¹ Although the new profiling system reduces false matches it does not eliminate them entirely; the Board expects one or two false matches to occur by chance over the next five years.²⁷ Errors can also still occur through contamination or accidental mix ups (by the police, laboratory or database staff). It is rare in the UK for DNA profiling to be carried out or repeated after the original prosecution, even though it might help to exonerate innocent people. In contrast, in the USA, the Innocence Project has exonerated 141 people, including 13 prisoners who were on death row.²⁸ Similar projects are now being advocated in the UK.²⁹

Conclusions

Since 1994, the UK Government has provided considerable financial and legislative support to expand the DNA Database. Rapid and far-reaching changes in legislation have been made with very little public debate. The latest changes to the law in England and Wales, which came into effect in April 2004, were introduced via a late amendment to the Criminal Justice Bill tabled in late March 2003. This happened less than a week before the Bill was debated in the House of Commons and at a time when the change was least likely to attract public attention and debate (during the first week of the war against Iraq).

More public involvement is needed in decisions about the National DNA Database, to ensure a careful and properly debated balance between crime detection, human rights and privacy. The present system:

- brings an increasing threat to 'genetic privacy' if information is revealed about health or family relationships, not just identity;
- creates a permanent 'list of suspects', including anyone arrested for a recordable offence;
- increases the potential for discrimination by routinely taking samples before an individual is charged, even when DNA evidence is not relevant to the investigation.

There are important changes that could be made that would improve safeguards for human rights and privacy without compromising the role of the Database in tackling crime.¹⁵ GeneWatch UK believes that a better balance would be struck by:

- the creation of an independent, transparent and accountable governing body;
- the destruction of individuals' DNA samples once an investigation is complete, after the DNA profiles used for identification have been obtained;
- an end to the practice of allowing genetic research using the Database or samples;
- independent research into the effectiveness of the DNA Database in tackling crime and the implications of new technologies;
- public debate about who should be included on the Database and for how long.

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