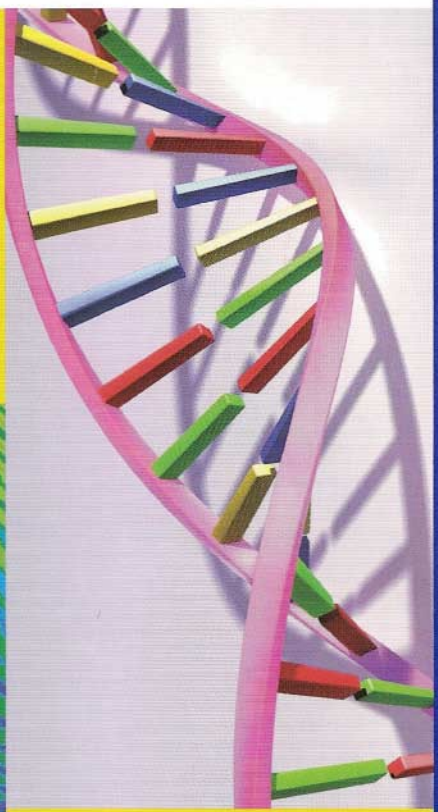
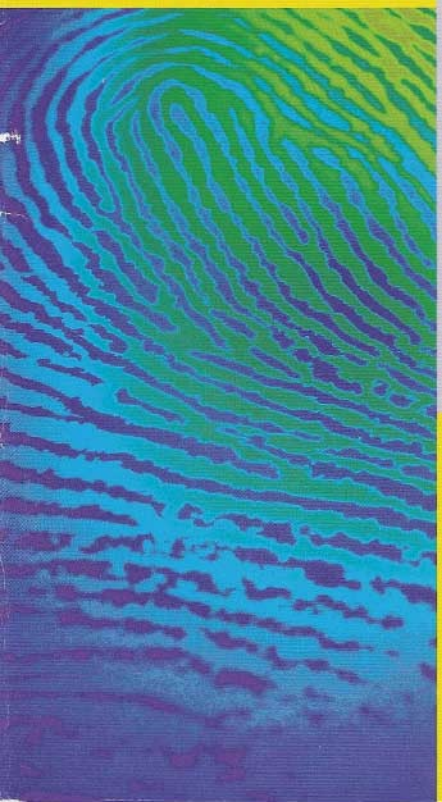
The forensic use of bioinformation: ethical issues





A guide to the Report

NUFFIELD COUNCIL ON BIOETHICS

The Nuffield Council on Bioethics has published a Report, *The forensic use of bioinformation: ethical issues.* It considers the ethical issues raised by the use of DNA and fingerprints in the criminal justice system.

This guide sets out some of the conclusions and recommendations that are discussed in more detail in the report.

Notes in square brackets throughout refer to the chapters and paragraphs in the report.

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BACKGROUND

Fingerprinting and DNA profiling are increasingly valuable tools in the fight against crime. However, in the UK, there is a debate about whether current police powers to take and use bioinformation – powers that can affect the liberty and privacy of innocent people – are justified.

In the UK, the police can take DNA and fingerprints without consent from anyone arrested for a 'recordable' offence (mostly offences that can lead to a prison sentence). In England, Wales and often in Northern Ireland, the samples are then stored permanently on forensic databases even if the person is later found to be innocent. As a result, the UK has the largest forensic DNA database in the world per head of population, holding around four million DNA profiles or six per cent of the population. The national fingerprint database contains over 6.5 million records.

In Scotland, DNA and fingerprint records are destroyed if the person is not charged or convicted, unless it is a very serious crime [Chapter 1].

THE SCIENCE

What is bioinformation?

Bioinformation (biological information) is derived from the analysis of a range of physical or biological characteristics of a person. We focus on DNA and fingerprints, which are often used to confirm the presence of a person at a crime scene.

Figure 1. A fingerprint with some ridge characteristics identified

What is fingerprinting?

The fingerprint is the most commonly used method of identification. No two people have been found with the same fingerprints (including identical twins). They develop before birth and remain unchanged throughout life. Identification by fingerprints relies on the matching of patterns and the detection of certain ridge characteristics, also known as Galton details [paras 2.2-2.4].

What is a DNA profile?

Each person's DNA is unique (except identical twins). A complete DNA sample, taken from a cheek swab of a suspect or from blood or other biological material found at a crime scene, contains all the genetic information about a person.

In forensic science laboratories, certain sections of the DNA sample are analysed to produce a series of 20 numbers, plus a sex indicator. This is the 'DNA profile', which contains only information to help with the identification of a person and confirm their sex. On average, the chance of two unrelated people sharing the same complete profile of 20 numbers is around one in a billion.

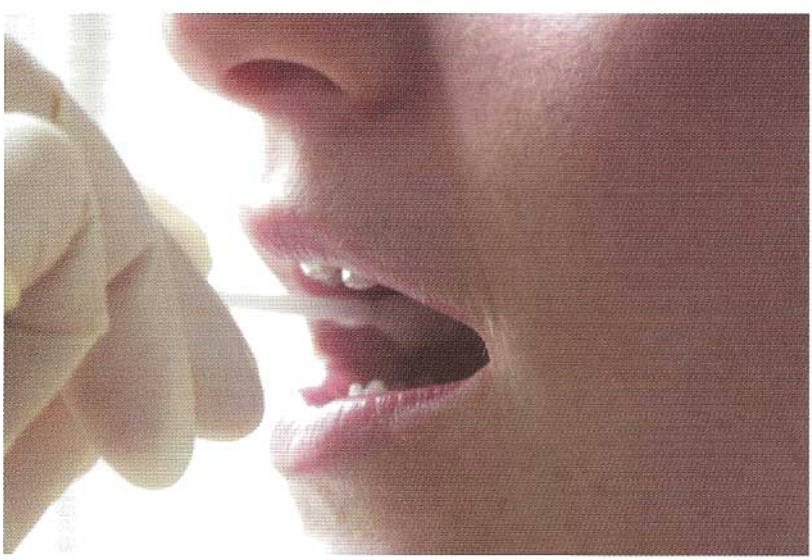
The DNA sample is stored and the DNA profile is put on the National DNA Database [paras 2.5-2.8].

Scientific reliability of DNA evidence

The science of DNA profiling is generally very reliable, and a match between a complete crime scene profile and a profile on the National DNA Database provides very powerful evidence that a person was present at a crime scene. However, problems can occur with the interpretation of evidence from mixed samples and partial profiles, and with contamination.

- **Mixed samples** contain DNA from more than one person and always require interpretation by a forensic expert.
- **Partial profiles**, derived from very small or degraded samples, are less reliable than complete profiles. They require much more skill in interpretation.
- **Contamination** can occur when samples come into contact with other DNA, for example from the police or laboratory staff. This can only be avoided by meticulous control of every aspect of sample collection and processing.

All these problems are particularly likely when the crime scene sample contains only minuscule amounts of DNA, requiring a special procedure (Low Copy Number, or LCN) to generate a profile. It is important for people considering DNA evidence in court to be aware of these potential problems (this is discussed further on page 16) [paras 2.25-2.31].



ETHICAL ISSUES

It is the Government's duty to protect the public from crime. However, the Government also needs to protect certain ethical values, such as liberty, autonomy, privacy, informed consent and equality. Sometimes these obligations conflict and a balance must be struck.

The Council broadly endorses a rights-based approach, recognising the importance to human beings of respect for their individual liberty, autonomy and privacy, but also the need, in appropriate circumstances, to restrict these rights either in the general public interest or to protect the rights of others [paras 3.4-3.23].

Civil liberties and human rights

In recent years there has been a growing body of equality and human rights legislation, including the Human Rights Act 1998. This means that some human rights are now legally enforceable and must be protected. For example:

- **The right to respect for private and family life** can only be interfered with for certain reasons, for example to prevent crime and protect of the rights and freedoms of others.
- **The right to a fair trial**, together with the right to fair treatment, embraces the principle that the prosecution must prove the guilt of the defendant beyond reasonable doubt [paras 3.29-3.34].

The principle of 'proportionality' is at the heart of the recommendations in the report. This means that any interference with legally enforceable human rights must be justified as being *proportionate* to the need to detect and prosecute offenders, and there must be evidence that the interference will be effective [paras 3.27-3.28].

The 'no reason to fear if you are innocent' argument

The argument is sometimes put forward that innocent people have nothing to fear from being on the National DNA Database. However, this argument ignores several points:

- If your DNA is on the Database, there is a chance you will be identified as a match or partial match to DNA found at a crime scene even if you are innocent. You may have been at the crime scene at an earlier date, or have a similar profile to the real criminal. This does not mean you will be charged, but being involved in a criminal investigation, and being tainted with suspicion, can be personally distressing.
- The Database was originally intended to represent the criminal community and so people may feel that being on the Database implies that they are a criminal.
- Sensitive genetic information can be obtained from DNA samples, such as family relationships. The fact that the police, forensic science services and people carrying out research on the Database have access to people's DNA without their consent could be seen as an intrusion of personal privacy [paras 3.24-2.26].

BIOINFORMATION IN CRIMINAL INVESTIGATION

Taking fingerprints and DNA

Fingerprints and DNA samples may be taken by the police, without consent, from anyone arrested for a 'recordable' offence (mostly offences that can lead to a prison sentence). These can be checked against the National DNA Database and the fingerprint database (called IDENT1) to help the police identify suspects for unsolved crimes.

In 2007, the Government consulted on proposals to extend police powers to allow them to take DNA without consent from people arrested for 'non-recordable' offences, which include minor offences such as littering and minor traffic offences. We recommend that these proposals should not be implemented.

We conclude...

It is proportionate for the police to take fingerprints and DNA without the need for consent from people arrested on suspicion of involvement in any recordable offence, but not minor non-recordable offences [paras 4.17 and 4.23].

Storing fingerprints and DNA

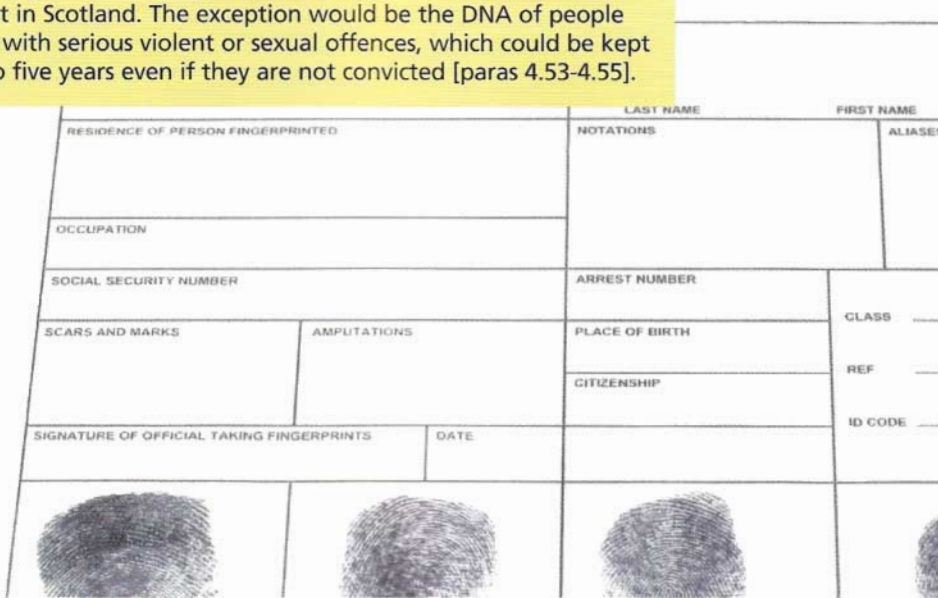
At present in England and Wales (but not Scotland) fingerprints and DNA taken from anyone arrested for a 'recordable' offence can be retained indefinitely without their consent, regardless of the outcome of the case.

The number of profiles on the DNA Database has doubled in recent years, yet the number of crimes solved where DNA evidence played a role has stayed more or less the same. It has been suggested that this is because the people now being added to the Database are unlikely to commit crimes in future.

There is a lack of convincing evidence that retention of profiles of those not charged or convicted has had a significant impact on detection rates and hence it is difficult to argue that such retention would be justified and proportionate.

We conclude...

Fingerprints, biological samples and DNA profiles should be retained indefinitely only for those convicted of a recordable offence. This would bring the law in England, Wales and Northern Ireland into line with that in Scotland. The exception would be the DNA of people charged with serious violent or sexual offences, which could be kept for up to five years even if they are not convicted [paras 4.53-4.55].

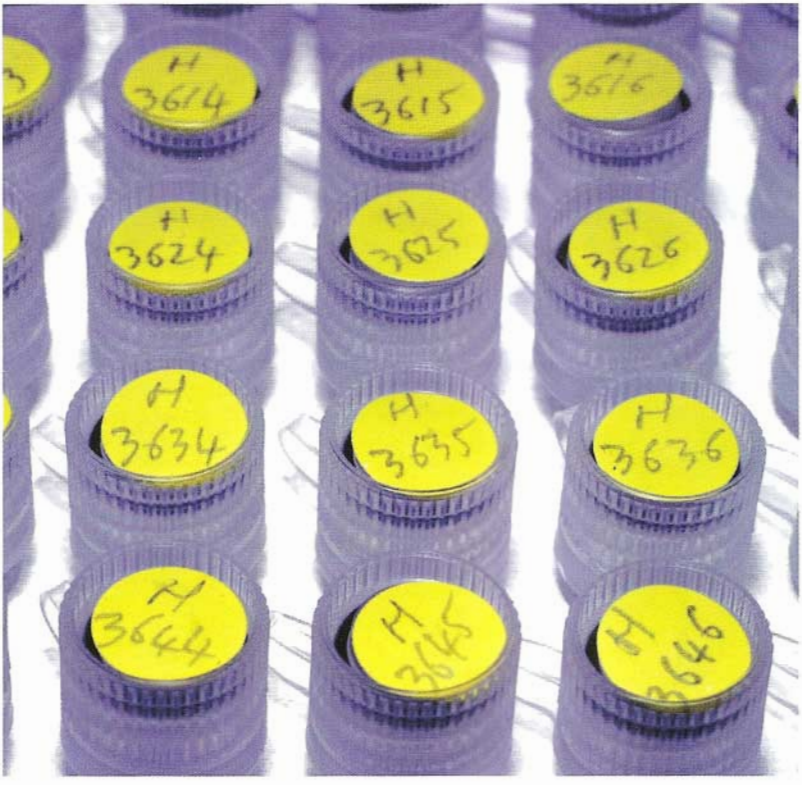


Victims, witnesses and volunteers

Biological samples and DNA profiles can only be taken and retained from witnesses, victims and volunteers (e.g. people who volunteer to take part in mass intelligence screens) if they give their consent. However, once consent is given, it cannot be later withdrawn. This approach is contrary to standard practice in medical research, and differs from practice in Scotland and many other European countries.

We conclude...

Volunteers should be able to have their DNA removed from the National DNA Database at any time without having to give a reason. Ideally, volunteers' DNA should not be stored beyond the conclusion of the relevant case [para 4.62].



Minority ethnic groups on the National DNA Database

Young black males are over-represented on the National DNA Database. Policing practices may have led to the disproportionate arrest of certain ethnic groups, and therefore their over-representation on the Database compared with their rates of conviction.

We conclude...

We welcome the 'equality impact assessment' of the National DNA Database that has recently been commissioned. This should reveal the extent to which it is the discretionary use of powers of arrest or the use of sampling powers that contributes to over-representation of black ethnic minorities [para 4.66].

Children on the National DNA Database

DNA from young people arrested on suspicion of a crime is retained in the same way as it is for adults, and there are around 750,000 under-18s on the National DNA Database. This may be particularly problematic in the UK, where the age of criminal responsibility is low – ten years in England and Wales and eight in Scotland.

It could be argued that retaining bioinformation from young people is contrary to Article 40 of the UN Convention on the Rights of the Child. The Convention requires special attention be given to the treatment of children by legal systems, to protect them from stigma, and that if they have offended, opportunities for rehabilitation should be maximised.

We conclude...

When considering requests for the removal from storage of fingerprints and DNA taken from minors, there should be a presumption in favour of the removal and destruction of all records, samples and DNA profiles. In deciding whether or not the presumption should be rebutted, account should be taken of factors such as:

- the seriousness of the offence;
- previous arrests;
- the outcome of the arrest;
- the likelihood of this individual re-offending;
- the danger to the public; and
- any other special circumstances [para 4.72].

Crime scene samples

At present, fewer than 20 per cent of crime scenes are forensically examined, and only a small proportion of these produce any biological material that can be tested. In addition, crime scene samples are not currently retained on the Database once the case is closed.

We conclude...

Expenditure for crime scene analysis should be given higher priority than the increased collection of samples from individuals. In addition, samples recovered from crime scenes must be retained indefinitely because they are unique and unrepeatable [paras 4.35 and 4.56].

Should there be a population-wide DNA database?

Some believe that taking the DNA of everyone at birth to build a population-wide forensic database would assist the police whilst also removing problems of discrimination. However, this would be hugely expensive, impractical and would have only a small impact on public safety. The intrusion of privacy incurred would therefore be disproportionate to any possible benefits to society.

We conclude...

Currently, the balance of argument and evidence presented to us is against the establishment of a population-wide forensic DNA database. However, the possibility of establishing a population-wide database should be subject to review as technology develops [para 4.79].

EXPANDING USES OF THE NATIONAL DNA DATABASE

The Police and Criminal Evidence Act 1984 states that police bioinformation databases may only be used for:

- the prevention or detection of crime;
- the investigation of an offence;
- the conduct of a prosecution; or
- identifying a deceased person or a body part.

However, these terms have been widely interpreted and the uses to which the National DNA Database is put have expanded to include searching for family relatives in the investigation of crime, predicting the ethnic appearance of a suspect, and carrying out research to aid crime detection.

Familial searching

When DNA collected at a crime scene does not exactly match any profile on the Database, it is possible to search for genetic relatives to help track down the person who left the sample. Many possible relatives can be found, and the process may reveal previously unknown family relationships.

We conclude...

Familial searching should not be used unless it is justified in each specific case. Clear public guidelines on the use of familial searching must be introduced, and these should contain safeguards to protect against any possible intrusion into family privacy [para 6.11].

Inferring ethnicity

When a person is arrested in England and Wales, as well as having a DNA sample taken, they are routinely assigned to one of seven ethnic appearance categories by the arresting officers for statistical purposes. Using this information, research has been carried out on links between DNA and ethnic appearance. As a result, forensic analysts can now suggest the likely ethnic group of a person whose DNA has been collected from a crime scene. The police may use this to narrow down their pool of suspects. However, the practice of assigning a 'racial type' to individuals is subjective and inconsistent. Also genetic research does not support the idea that humans can be classified into a limited number of 'races'.

We conclude...

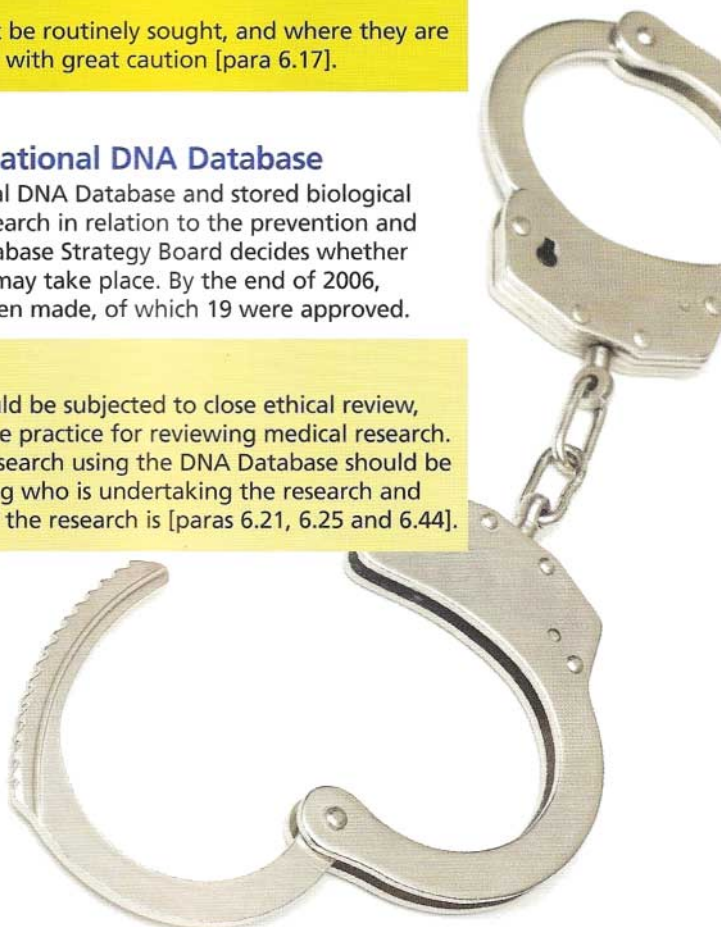
Ethnic inferences should not be routinely sought, and where they are used they should be treated with great caution [para 6.17].

Research using the National DNA Database

DNA profiles on the National DNA Database and stored biological samples can be used for research in relation to the prevention and detection of crime. The Database Strategy Board decides whether proposed research projects may take place. By the end of 2006, 33 research requests had been made, of which 19 were approved.

We conclude...

Any research proposals should be subjected to close ethical review, making it more similar to the practice for reviewing medical research. In addition, details about research using the DNA Database should be published regularly, including who is undertaking the research and exactly what the purpose of the research is [paras 6.21, 6.25 and 6.44].



GOVERNANCE AND ETHICAL OVERSIGHT

Governance

Laws governing the collection and retention of forensic bioinformation have been gradually added to over the years, and as a result are confusing.

We conclude...

The regulation of forensic databases should be clearly enshrined in law. This should include oversight of research using the National DNA Database and other access requests [para 7.55].

Ethical oversight of the DNA Database

The potential uses and abuses of forensic databases are considerable and any possible harmful effects must be minimised. The Home Office has recently established an Ethics Group to advise the DNA Database Strategy Board on policy, which we welcome.

We conclude...

The Ethics Group should adopt an ethics and governance framework to clarify its role, relationships with other bodies, responsibilities, powers and how it will maintain its independence [para 7.25].

Removing DNA from forensic databases

If requested, Chief Constables can decide to remove an individual's records and samples from a police database if there are 'exceptional circumstances'. The 'exceptional circumstances' criteria are very restrictive, and the Chief Constables' discretion is wide.

We conclude...

An independent body, along the lines of an administrative tribunal, should oversee requests from individuals to have their profiles removed from bioinformation databases. The police should have to justify the need for retention [para 7.37].

International exchange of forensic data

Countries in the European Union and beyond are expanding their bioinformation databases, and demands are increasingly being made for data to be shared among international law enforcement agencies. Between 2004 and 2006, around 400 searches were performed on the UK's Database in response to requests from overseas. However, privacy laws vary from country to country.

We conclude...

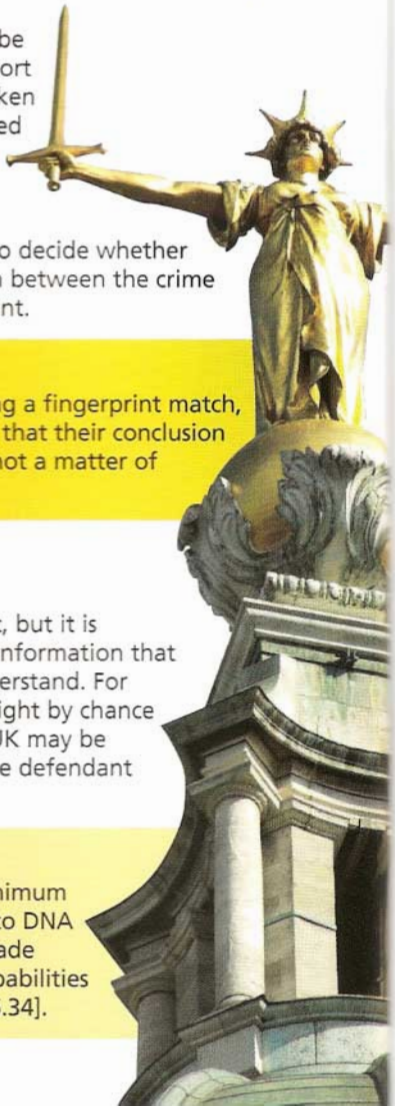
There should be safeguards in place to protect sensitive information on the UK DNA Database being shared with other countries. There should be agreement about:

- the level of data protection in all authorities or agencies that receive information;
- the criteria for sharing data, for example only for the investigation of serious crimes or in special circumstances; and
- sharing only as much information as is necessary to meet the request and only to those authorities or agencies that 'need to know' [para 7.42].

THE USE OF BIOINFORMATION IN COURT

DNA and fingerprints can only assist in a prosecution when the science is robust, and is interpreted and represented accurately.

In addition, DNA evidence must always be accompanied by other evidence to support the case. Therefore, care needs to be taken over how bioinformation evidence is used in court.



Fingerprint evidence

Fingerprints are analysed by experts who decide whether or not, in their opinion, there is a match between the crime scene mark and the accused person's print.

We conclude...

When presenting their opinion regarding a fingerprint match, fingerprint experts should make it clear that their conclusion is always one of expert judgment, and not a matter of absolute certainty [para 5.15].

DNA evidence

DNA evidence is very influential in court, but it is accompanied by complicated statistical information that can be difficult for non-scientists to understand. For example, evidence that a profile that might by chance occur in one in a million people in the UK may be mistaken to mean that the chance of the defendant being innocent is one in a million.

We conclude...

Legal professionals should acquire a minimum understanding of statistics with regard to DNA evidence. Information should also be made available to jury members about the capabilities and limitations of DNA evidence [para 5.34].

NUFFIELD COUNCIL ON BIOETHICS

Summary

Fingerprinting and DNA profiling are valuable tools in the detection and prosecution of offenders, but more safeguards are needed to protect the liberty and privacy of the innocent.

The principle of proportionality is used as the basis for recommendations to policy makers in the following areas:

- the storage of bioinformation taken from witnesses, victims, children, and people who are not later convicted;
- the use of the National DNA Database for familial searching, ethnic inferencing and research;
- the possibility of a population-wide DNA database;
- the use of bioinformation in court; and
- the governance and ethical oversight of forensic databases.

Copies of the report are available to download from the Council's website:
www.nuffieldbioethics.org

To order a printed copy or CD, please email
bioethics@nuffieldbioethics.org

Published by
Nuffield Council on Bioethics
28 Bedford Square
WC1B 3JS

Telephone: +44 (0)20 7681 9619
Fax: +44 (0)20 7637 1712
Internet: www.nuffieldbioethics.org

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