



ORIGINAL ARTICLE

Forensic DNA databases—Ethical and legal standards: A global review



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Received 23 April 2014; accepted 28 April 2014

Available online 7 June 2014

KEYWORDS

Forensic DNA;
DNA databases;
Human rights;
Ethics;
Quality assurance;
Data protection

Abstract *Background:* The Forensic Genetics Policy Initiative (www.dnapolicyinitiative.org) is a civil society-led project which aims to set human rights standards for DNA databases around the world, by establishing best practice and involving experts, policy makers and members of the public in open debate. The authors have collected a comprehensive data set of information on the state of forensic DNA profiling and the development of DNA databases for policing purposes in more than 100 countries. The information is available in wiki which can be expanded, updated or corrected by interested persons (<http://wiki.dnapolicyinitiative.org>).

Results: A summary of the current global situation and issues for debate highlights: (1) a growing global consensus on the need for legislative provisions for the destruction of biological samples and deletion of innocent people's DNA profiles, following the European Court of Human Rights' judgement on this issue in 2008; (2) emerging best practice on scientific standards and standards for the use of DNA in court which are necessary to prevent miscarriages of justice; (3) ongoing debate regarding the appropriate safeguards for DNA collection from suspects; restrictions on access, use and data sharing across borders; and data protection standards.

Conclusion: There is an ongoing need for greater public and policy debate as DNA databases expand around the world. Some safeguards are implemented at the national or regional level, but there is an ongoing lack of global standards and a need for more societal engagement and debate.

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1. Introduction

The UK National DNA database was the first forensic DNA database established in the world in 1995. Although the criminal DNA database was initially widely supported by the public, a major expansion of the database, which allowed a significant number of innocent people's records to be kept, became highly controversial.^{1–3}

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Peer review under responsibility of The International Association of Law and Forensic Sciences (IALFS).

<http://dx.doi.org/10.1016/j.ejfs.2014.04.002>

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Under former UK Prime Minister Tony Blair, legislation was introduced as part of the Criminal Justice and Police Act of 2001 to allow DNA profiles to be kept on the Database even when a person was acquitted of a crime. In April 2003, the law was changed again to allow DNA to be taken as soon as a person is arrested, rather than waiting for them to be charged with an offense; this legislation came into effect in England and Wales in April 2004.⁴

These changes to the law allowed more than 1 million innocent people's DNA profiles to be retained on what was previously a criminal DNA database, overturning the presumption of innocence until proven guilty. Many were young children (arrested in England and Wales from the age of 10) accused of minor offenses such as damaging trees or fences, and some were victims of crimes, or people who had intervened to try to stop a fight, but who had been falsely accused by their attacker. In one case a grandmother had her DNA taken when she was arrested for alleged theft when she failed to return a football that some children had kicked into her garden.⁵

As a UK-based civil society organization with a remit to study and engage the public in debate about social implications of genetic technologies, GeneWatch UK was actively involved in the debate about the National DNA Database expansion, for example by providing evidence to parliamentary committees and to the European Court; publishing briefings and reports; speaking to the media; responding to individuals' concerns about their own DNA records or those of their families. Public concerns, reported directly to the researchers or in the media, included:

- The personal nature of their DNA;
- Being treated like a criminal (unfairness);
- The growth of a 'Big Brother' state and potential misuse of data by government (tracking individuals or groups of people or their families);
- Potential loss of data or misuse of data (including by corrupt police officers, commercial providers or infiltrators);
- The implications of having a 'criminal' record for the rest of their life (including implications for employment, visas or treatment by the police);
- The possibility of being falsely accused of a crime.

DNA evidence can undoubtedly play an important role in solving crimes, but the UK experience also provides important evidence that "widening the net" to include large numbers of innocent people on criminal DNA databases does not help to solve more crimes. Although many countries record DNA matches between crime scene DNA profiles and individuals' DNA profiles stored on a DNA database, only the UK keeps records of DNA detections, which are typically crimes where the match has led to prosecution in a court. Recording detections is important because many matches may be with the victim or a passer-by, not with the perpetrator of the crime. [Figure 1](#) shows DNA detections from 1 April 1998 to 31 March 2012, alongside the growth in the size of the DNA database. Some of these DNA detections would continue to be made even if the DNA database did not exist, as many individuals are identified as a suspect before their DNA is collected.⁶ The proportion of recorded crimes involving DNA detections has remained roughly constant at 0.36% since April 2003 and is driven primarily by the number of crime scene DNA profiles

added to the database, not by the number of individuals added. About half of detections lead to a conviction. Since innocent people are unlikely to commit future crimes, expanding the DNA database to include large numbers of innocent people did not help to solve more crimes than before the law was changed.

In 2006, Tony Blair proposed a universal DNA database to include every citizen and visitor to Britain, sparking further political debate.⁷ Criticisms included:

- That building a universal DNA database would be a poor use of resources, since DNA is collected from only 1% of recorded crimes, and including innocent people on the criminal DNA database had not helped to solve more crimes;
- The likely loss of public trust and the need to criminalize all those members of the population and visitors who might refuse to voluntarily provide their DNA;
- Potential misuse by the police and the State or anyone who might infiltrate the system (allowing tracking and identification of individuals and their family members, including non-paternity);
- Increased risk of errors and false matches with crime scene DNA as the database expands.

In June 2008, 61% of police chiefs voted against a universal DNA database at their annual conference.⁸

In December 2008, the Grand Chamber of the European Court of Human Rights in the case of *S. and Marper v. the UK* (known as the Marper case) reached a unanimous judgment that the indefinite retention of innocent people's DNA profiles, fingerprints and samples breached Article 8 of the European Convention on Human Rights (the right to privacy).⁹ The Grand Chamber concluded that: "*the retention at issue [of DNA profiles, biological samples and fingerprints] constitutes a disproportionate interference with the applicants' right to respect for private life and cannot be regarded as necessary in a democratic society*".

In response to the judgment and to extensive public and parliamentary debate, the Protection of Freedoms Act 2012 came into force in England and Wales in 2013.¹⁰ As a result, over 1.7 million DNA profiles taken from innocent people and from children have been removed from the DNA database and 7,753,000 DNA samples have been destroyed.¹¹ DNA profiles and fingerprints from innocent people arrested for minor offenses must be removed automatically when they are acquitted or proceedings are dropped. For more serious alleged offenses, innocent people's DNA profiles can be held for up to 3 years. Biological samples taken from individuals (but not those from crime scenes) must be destroyed within 6 months of collection. The law brings England and Wales into line with the law in Scotland (where the Scottish Parliament rejected proposals to include innocent people on its DNA database in 2006) and similar legislation has been adopted in Northern Ireland.

Events in the UK raise important questions for DNA databases around the world. What safeguards are necessary to protect human rights, prevent miscarriages of justice and maintain public trust? Questions include:

- When should DNA be collected? Whose DNA should be stored?
- How should access and uses be restricted?

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