

This response was submitted to the consultation held by the Nuffield Council on Bioethics on the Forensic use of bioinformation: ethical issues during November 2006 to January 2007. The views expressed are solely those of the respondent(s) and not those of the Council.

GeneWatch UK

List of questions

1. The interpretation of bioinformation

- a. In your view, is the SGM Plus® system, which uses ten STR markers, sufficiently reliable for use in ascertaining the identity of suspects in criminal investigations and/or criminal trials?

It would be unrealistic to upgrade the entire Database to a new profiling system and the idea that this might happen in the future has been wrongly cited as one justification for retaining individuals' DNA samples indefinitely. The impracticality of upgrading has already been demonstrated with the attempted upgrade from the old SGM system to SGM Plus. According to the National DNA Database Annual Report 2004/5¹ (page7) the cost of upgrading all profiles to SGM Plus has been prohibitive and the police are now encouraged only to upgrade profiles involved in matches. Only about 9% of individuals' SGM profiles (page7) and about 0.23% of crime scene sample records (page19) have been upgraded to SGM Plus. In addition, it is the existence of only a partial crime scene profile which often limits the reliability of any match, rather than the number of markers used.

However, there may be a case for using more markers for new DNA profiles where feasible and/or for using more markers to profile a second sample from an individual charged with an offence, particularly in cases where DNA evidence is disputed. This issue should be considered by a future regulator, in the context of assessing and minimising other possible sources of error (see also response to Question 5).

2. Sampling powers

- a. From whom should the police be able to take fingerprints and DNA samples? At what stages in criminal investigations and for what purposes? Should the police be able to request further information from DNA analysts, such as physical characteristics or ethnic inferences?

The police in England and Wales routinely take DNA on arrest for any recordable offence. In the vast majority of cases the individual's DNA is not relevant to the alleged offence. However, in a small number of cases, individuals arrested for a relatively minor offence may be matched to DNA from the scene of a more serious crime.

Unless it is relevant to the specific offence being investigated, taking DNA on arrest is open to abuse and bias (including, but not limited to, racial bias) because there is no oversight of the process of arrest. This is likely to exacerbate existing biases in the criminal justice system and probably contributes to the high proportion of black males retained on the Database. A particular concern arises in the context of protests or demonstrations, where one person painting a slogan on a wall, for example, may lead to a large number of people being arrested 'on suspicion' of causing criminal damage and added permanently to the DNA database. Similar issues may arise when groups of

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teenagers or adults are arrested in connection with criminal damage or public order offences, which may have been committed by one member of a crowd or group.

GeneWatch UK believes more public debate is needed to achieve an acceptable balance between threats to privacy and rights and the role of the DNA Database in tackling crime. Our current view is that relatively broad powers to take DNA are acceptable only if there are strict rules on retention, including independent oversight of the removal process (see response to Q2c). DNA samples should be destroyed once the DNA profiles used for identification purposes have been obtained. Retention of DNA profiles on the Database should be for fixed time periods depending on the nature of the offence (see response to Q2c). In addition, steps should be taken to limit the unfair or arbitrary application of such powers.

This would allow the police extensive powers to check whether an individual is a possible suspect for a past crime, whilst limiting the potential for future surveillance of people who have done nothing wrong, or committed only minor offences. In addition, a return to taking DNA on charge, rather than arrest, (unless needed to investigate a specific offence) would help to address concerns about bias in whose DNA is taken.

Attempts to predict the physical characteristics of a suspect from crime scene DNA may do more harm than good if they mislead an investigation. There are serious limitations to all attempts to predict ancestry and appearance from DNA. Attempts to predict ethnic appearance are particularly questionable because they may reinforce existing prejudices about an offender and erode the trust of the community in the police. Historically, genetic explanations of race have been used against ethnic minority groups, causing stigma and discrimination, and being used to justify racism, colonialism and eugenics. The use of ancestry testing in Operation Minstead (the hunt for a serial rapist in South London) has been highly controversial, involving both misleading claims about the predictive value of the test, and a loss of trust in the black community.^{ii,iii,iv} A number of commercial companies have been marketing tests of this type to the police, without adequate consideration of their limitations.

A new regulator is needed to consider the implications of the use of such techniques during an investigation, including: potential to mislead the police; ethical, privacy and social implications; and potential impacts on public trust, including impacts on BME groups (see also Q3b).

- b. Should police expenditure on bioinformation collection and analysis be given priority over other budgetary demands?

No – priorities should depend on the contribution to tackling crime, taking into account social benefits and harms. An independent assessment is needed of the effectiveness and cost-effectiveness of DNA and fingerprint collection and analysis in tackling crime – no such analysis has yet been published.^{v,vi} This analysis should consider whether the recent massive expansion of the number of individuals on the Database has delivered any significant benefit in terms of tackling crime. Existing data suggests that permanently retaining the DNA of everyone who is arrested has not made any noticeable difference to

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the likelihood of detecting a crime, whilst other changes (such as more and quicker forensic analysis of crime scenes) have delivered benefits.^{vii} The retention of DNA samples (as opposed to profiles) also does nothing to increase DNA detection rates. A smaller, more manageable Database – with time limits on the retention of individuals' profiles, depending on the nature of their offence - and the destruction of DNA samples once an investigation is complete - could cut costs without noticeably affecting the number of DNA detections or successful prosecutions (see also response to Q2c).

The annual police payments to commercial companies for storage of individuals' DNA samples indefinitely are particularly difficult to justify in the context of other budgetary demands. These payments appear to benefit the companies involved rather than the criminal justice system.

- c. Do you consider the current criteria for the collection of bioinformation to be proportionate to the aims of preventing, investigating, detecting and prosecuting criminal offences? In particular: is the retention of bioinformation from those who are not convicted of an offence proportionate to the needs of law enforcement?

No. Indefinite retention is clearly not proportionate to the needs of law enforcement. This is true both for individuals who are not convicted and for people who have convictions for relatively minor offences. Retention of bioinformation from individuals is only of value to law enforcement if they are likely to go on to commit a future crime in which DNA evidence may be relevant. There were 20,349 direct DNA detections in 2005-06 (i.e. there were 20,349 crimes detected in which a DNA match report was available)^{viii} – this compares to 20,489 in 2003/04 and 19,873 in 2004/05. Hence, despite a significant increase in the number of individuals on the Database, DNA detections have not increased over the past 3 years. The most likely explanation is that many people now being added to the Database are unlikely to commit the type of future crimes for which DNA evidence is relevant. The Home Office's own analysis indicates that it is the number of crime scene DNA profiles obtained, rather than the number of individuals retained on the Database, that influences DNA detection rates.^{ix} A system of time limits on the retention of individuals on the Database – depending on the nature of their offence - would be unlikely to reduce the usefulness of the Database in tackling crime, and hence would be more proportionate to the needs of law enforcement.

More than a million people now on the National DNA Database have not been convicted or cautioned for any crime,^x although some of these individuals will be awaiting trial. Many other individuals, including children, will be held permanently on the Database for relatively minor public order offences. This expansion of the Database is not only disproportionate, it also risks a loss of public trust in the police use of DNA.

The Government often cites the number of DNA matches between crime scenes and individuals in its justification of this expansion, but has provided only limited information on DNA detections and has failed to quantify the impact of the various elements of the DNA Expansion Programme on successful prosecutions. A number of cases have been cited to show that taking the DNA of people arrested in connection with minor offence can sometimes help identify the perpetrator of a serious past crime. However, these cases do not justify keeping DNA from the much larger number of people whose DNA does not match any crime scene and have not committed any offence.

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During consultation on the issue of permanent retention of DNA in Scotland, the police liaison officer for the Scottish Police DNA Database expressed concerns that blanket retention of DNA could reduce public support and that *“It is arguable that the general retention of profiles from the un-convicted has not been shown to significantly enhance criminal intelligence or detection”*.^{xii} Although DNA is kept permanently in Scotland from some people convicted of relatively minor offences (such as Breach of the Peace), the Scottish Parliament voted against permanent retention of DNA from people who were not convicted of any offence, in May 2006. Members of all political parties expressed the view that permanent retention was disproportionate to the needs of the criminal justice system. Instead, police powers were expanded to allow temporary retention of DNA (for up to 5 years) from a much smaller number of people who had been charged but acquitted of a serious violent or sexual offence.^{xiii} Although the Labour Party in Scotland has recently stated that it will bring Scottish legislation into line with England and Wales if it wins next May’s elections, this is opposed by all its potential coalition partners.^{xiv, xv}

- d. Is it acceptable for bioinformation to be taken from minors and for their DNA profiles to be put on the NDNAD?

It is acceptable for bioinformation to be taken from minors in circumstances where it is relevant to the investigation of a specific offence – particularly in those rare cases when minors are suspected of involvement in serious offences such as rape or murder. However, the routine collection and permanent retention of DNA and fingerprints, taken on arrest for any recordable offence, is unacceptable. The same issues arise for minors as for adults, however they are exacerbated by several factors. These include: the much longer timescale for which their DNA is likely to be retained (encompassing many changes in technology and oversight, that could reveal more personal information or lead to unforeseen uses or misuses); the social implications of being stigmatised at a young age; the potential to reveal non-paternity via the use of familial searching; the special protection needed for children’s rights in the legal system; the high proportion of under-18s arrested for relatively minor offences which lead to no further action by the police; the role of peer pressure and the likelihood of arrest in a group of young people only one of whom may have committed an offence.

Retaining DNA indefinitely can lead to anxiety for children who have committed no offence, and who may even have been reporting an offence or trying to aid the police with their inquiries. For example, Caitlin Bristow, aged 15, was arrested in England in 2005 and had her DNA and fingerprints taken. She had reported an assault and a counter-claim had been made against her, but she was never charged, let alone convicted, of any offence. Caitlin told her local paper: *“I’m worried that it will scar my record for life. It might come up if I went for jobs, such as with children – not that I’ve been in trouble, but just that I’m known to the police.”*^{xvi}

Research has found that both parents and children have reservations about samples being taken for petty crime and feel that there are dangers in stigmatising young people for a one-off act.^{xvii}

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3. The management of the NDNAD

- a. Is it proportionate for bioinformation from i) suspects and ii) volunteers to be kept on forensic databases indefinitely? Should criminal justice and elimination samples also be kept indefinitely? How should the discretion of Chief Constables to remove profiles and samples from the NDNAD be exercised and overseen?

Retention of individuals' DNA samples (as opposed to profiles, or crime scene samples) is not necessary for identification purposes and unnecessarily increases privacy concerns and costs. Individuals' samples are destroyed in some other countries, such as Germany, and sample destruction is also part of Italy's new law.^{xviii} The Home Office has recognised that retaining DNA samples is "*one of the most sensitive issues to the wider public*"^{xix} and the Human Genetics Commission has concluded that the reasons given for retaining individuals' samples are "*not compelling*".^{xx,xxi} GeneWatch UK agrees that it is difficult to justify anything but temporary storage of DNA samples for quality assurance purposes, and that the idea that retained samples from individuals would be upgraded to use new profiling systems in future is unrealistic (see also Q1). Retention of samples from individuals is not necessary to prevent miscarriages of justice because a new sample can always be taken from a person accused of a crime before they appear in court. Destroying samples once the profiles used for identification purposes have been obtained from them would prevent their misuse for controversial genetic research, limit the potential for increased erosion of genetic privacy in the future, enhance public trust and also cut costs.

In addition, individuals should not be kept on forensic databases indefinitely, unless they have been convicted of a serious violent or sexual offence. Time limits on retention of DNA profiles, as well as the destruction of samples, are an important safeguard against misuse by future governments.

Former Home Office Minister, Andy Burnham MP, stated that: "The decision whether to retain or remove a sample is an operational one for the chief constable of the police force which took it."^{xxii} Essentially the law allows for an individual's DNA profile to be added to the database, on arrest for any recordable offence, but does not make it compulsory to do so, or to keep their records and samples permanently. However, in practice both the collection and permanent retention of DNA is now routine for all people arrested from the age of ten. For example, when Ashley Martins, aged 12, was arrested on suspicion of stealing a mobile phone, his mother complained to the police about the permanent retention of his DNA, which was taken although he was never charged with any offence. Detective Constable Andy Gill, of Hounslow police, was reported as saying: "*In the case of Ashley Martins we acted within the established protocol. At the age of 10, children should know the difference between right and wrong and we will take DNA from anyone we bring in*".^{xxiii}

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On 24th April 2006 the Association of Chief Police Officers (ACPO) produced a policy document giving guidance to Chief Constables which 'suggested' that removal should only take place in exceptional circumstances and that Chief Constables may need support in making decisions on 'exceptional cases'.^{xxiv} ACPO have also provided Chief Constables with two sample letters, to deal with requests for removal. This process replaces the previous time limits for removal from the database^{xxv} (based on type of offence and whether a person had been convicted or not) with an unfair and arbitrary system, in which some unconvicted people are presumed more innocent than others. Cases seem to be determined largely by the extent to which the police have been embarrassed by publicity – for example, in the case of the student David Atkinson^{xxvi} - rather than by a fair process. In GeneWatch's view this situation can only properly be dealt with by a change in the law.

Removal of profiles from the National DNA Database should be required by legislation, based on a system of time limits similar to the original Home Office guidance adopted when the Database was first set up, rather than left to the discretion of Chief Constables. A recent poll has indicated some public support for the idea of time limits on retention, with 92% of respondents supporting permanent retention for people convicted of a serious violent or sexual offence, 49% for people convicted of burglary and only 21% for people convicted of a public order offence.^{xxvii} A system of time limits should therefore be developed that has public input and support. Confidence in the removal system should be ensured by enshrining the time limits in legislation and by establishing an independent regulator, to whom members of the public can complain if the rules are broken, as they were in the past (see also response to Q3b).

- b. Is the ethical oversight of the NDNAD adequate? What, if any, research on NDNAD profiles or samples should be permitted? Who should be involved in the oversight of such databases and granting permission to use forensic DNA profiles or samples for research?

Current oversight is inadequate. For example, Freedom of Information requests by GeneWatch UK to the NDNAD Board have shown that since the year 2000, 19 research projects have been allowed and 14 refused.^{xxviii} The requests revealed that stored DNA samples have been used for genetic studies of the male Y-chromosome, without the consent of the people involved, as part of a controversial attempt to predict ethnicity from DNA. This type of research could also inadvertently reveal other genetic characteristics such as a man's risk of infertility.^{xxix, xxx} Despite numerous requests for information, the list of research projects is still incomplete (other projects were undertaken between 1995 and 2000) and, in addition, the decision making process remains inadequate and unclear.

Current 'research uses' of the National DNA Database include a wide range of activities such as:

- the creation of statistics used to assess the performance of the Database;
- attempts to identify the relatives of a suspect on the Database ('familial searching');
- attempts to find named individuals on the Database;
- the selection of records from the Database on the basis of criteria such as ethnic origin or "having typical Muslim names";
- the use of DNA profiles and other information, selected or otherwise, for research;
- the use of the original DNA samples for genetic research.

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In GeneWatch's view, 'research' uses should be restricted to activities intended to assess the use and reliability of the Database, and should not include genetic research intended to predict physical or other characteristics from DNA. Use of the NDNAD and associated samples without consent, for research unrelated to quality assurance of the database, is of questionable legality and risks a major loss of public trust. Many people on the Database would be unlikely to consent to genetic research on race, ancestry or ethnic appearance. Failure to involve people who are on the database in these decisions – whether they are convicted prisoners, innocent children, or victims of crime who gave their DNA for elimination purposes – runs contrary to well-established ethical principles, intended to ensure that the vulnerable are not exploited.

In its recent consultation, the Home Office has recognised that there is a 'regulatory gap' in standard setting for forensic science, and that a new regulator is needed^{xxx}. In GeneWatch UK's view the aims of any new regulatory structure should be:

- to evaluate independently the quality, validity, cost-effectiveness and limitations of forensic services that may be procured by the police;
- to identify and address any broader ethical or social issues that might impact on public trust in forensic services;
- to operate in a transparent way, that is open to democratic scrutiny, and to consult and engage the public in important ethical decisions.

This requires an independent agency (at arms length from the Home Office) – for example a Non-Departmental Public Body, like the Independent Police Complaints Commission - that is both transparent and publicly accountable.^{xxxii} Such a regulator could also provide a system for addressing complaints and ensuring compliance with any legislation to implement time limits on the retention of individuals on the Database (including the removal of people who have not been charged or who have been acquitted).

- c. Who should have access to information on the NDNAD and IDENT1 databases and how should bioinformation be protected from unauthorised uses and users? Should forensic databases ever be made available for non-criminal investigations, such as parental searches, or the identification of missing or deceased persons?

Direct access to the National DNA Database has rightly been restricted to a small number of individuals. Unauthorised or widespread access (for example by all police officers) to the Database could lead to major breaches of privacy (including possible misuse to reveal paternity). There is also the potential for other serious misuses – including, for example, the planting of DNA evidence to incriminate someone on the Database. A major potential concern is the deliberate or inadvertent undermining of witness protection schemes – or national security - by revealing the identity of someone who has had their identity changed for their own safety (reportedly already a concern for mafia investigations in Italy).

Several major threats to the security of the Database have arisen recently:

1. Revelations that the commercial company LGC kept copies of information sent to it by the police, including individual's demographic details, alongside their DNA profiles and samples.^{xxxiii, xxxiv} This makes a mockery of claims that access to the Database is tightly restricted and raises important questions about who is responsible for such mini-databases under data protection law.

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2. New systems designed or proposed to check the DNA, photographs, or fingerprints of individuals on the spot. For example, the new Criminal History System will reportedly allow officers will be able to input new information and access existing records from their patrol car or a hand-held device^{xxxv} and portable DNA analysers are being developed^{xxxvi}. Such devices are likely to considerably widen Database access and increase security risks.

3. The European Union's proposed Draft Framework Decision on exchanging information between law enforcement agencies in member states^{xxxvii} – particularly the British Government's proposal that this should include direct on-line access to the National DNA Database by law enforcement agencies in other countries. It is unclear how access could be adequately vetted in such circumstances (potentially leading to sensitive genetic information being passed to organised criminals, foreign security agencies or journalists).

4. The widening of uses, particularly to include family relationships, and reported secret guidance on the extension of criminal investigations to make routine use of medical databases and health information of family members.^{xxxviii}

5. The privatisation of sample analysis, the proposed partial privatisation of the FSS, and the Home Office's intention to put management of the National DNA Database out to tender. Frequent changes in management, and the use of multiple suppliers, increases the number of people with access to all or part of the Database (including copies of parts of the Database, such as that kept by LGC, and DNA samples, which providers are paid to retain).

Little or no attention appears to have been paid to the implications of these changes for data security and privacy. Breaches of security could have major implications in terms of loss of public trust, and in some situations could be harmful to the justice system or national security (particularly if supposedly protected identities – for example, of security service personnel or people on witness protection schemes – or family relationships, are inadvertently revealed).

- d. What issues are raised by the transfer of bioinformation between agencies and countries? How should such transfers be facilitated and what safeguards should be in place for the storage and use of transferred data?

The exchange of bioinformation between countries clearly has potential to solve some crimes committed by the same person in more than one country, or identify suspects who have fled abroad. However, such information could also be misused. For example, foreign states could use it to implement surveillance on political opponents or to reveal personal genetic information. Concerns depend on what information foreign agencies are allowed to access and in what circumstances. A lack of international legislation to protect privacy exacerbates these concerns. Direct access to the National DNA Database (as the Government has proposed within the EU) could reveal the DNA profiles of large numbers of people, including many innocent people and people convicted of offences related to political protests.

A specific request made by a foreign agency to search the Database for a match with a DNA profile from a known crime scene may lead to a potential suspect for a serious crime being identified. In addition to information on such matches, DNA profiles of named individuals are also sometimes supplied to the UK National Central Bureau for Interpol

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(UK NCB) to supplement fingerprint information.^{xxxix} If agencies are allowed to seek the profiles of named individuals, or of groups of people (identified by age and ethnic appearance, for example), or to search the Database directly without oversight, there is much greater potential for misuse. This is a particular concern if foreign agencies with questionable human rights records are involved.

In GeneWatch's view, use of the Database by foreign agencies should be restricted to seeking matches for profiles obtained from the scenes of specific unsolved serious crimes. Direct access should not be given but, if a match arises, it may be reported to the foreign agency. An independent forensic regulator should oversee the response to all such requests, including which requests are granted and how any matches are followed up. An assessment of proportionality and potential human rights implications should be made by this independent regulator, rather than by the UK NCB.

4. Ethical issues

- a. Is the use of DNA profiles in 'familial searching' inquiries proportionate to the needs of criminal investigations? Do you consider the use of familial searching may be an unwarranted invasion of family privacy?

Familial searching (looking for a partial DNA match which may identify a relative of a suspect) usually produces a long list of names of people to be interviewed. It raises ethical concerns because it could reveal cases of paternity or non-paternity that the people interviewed did not know about and could also reveal to relatives who is on the Database. However, a small number of high-profile cases have been solved using familial searching. Concerns about the ethical implications of this technique led to discussions between ACPO, the Home Office, the Information Commissioner and representatives of the Human Genetics Commission to agree a Memorandum of Understanding on its use.^{xi} However, this document is still not available for public scrutiny. The House of Commons Science and Technology Committee expressed concern that familial searching had been introduced in the absence of any Parliamentary debate about the merits of the approach and its ethical implications.^{xii}

GeneWatch UK accepts that familial searching might be justifiable in some circumstances. However, its routine use would raise major concerns about revelations of private family relationships – including some potentially involving police officers. Reports of secret guidance advocating much greater use of family information – including DNA and medical information – raise serious ethical concerns.

Any new system of regulation should require the ethical implications of new techniques such as familial searching to be widely debated and discussed *before* their introduction, and any rules about their use should be made public and open to debate. This should be part of the role of a new independent forensic regulator.

- b. Certain groups, such as ethnic minorities and young males, are disproportionately represented on forensic databases. Is this potential for bias within these databases acceptable?

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Black men in particular are disproportionately represented on the DNA Database, with reports suggesting that up to 3 out of 4 young black men (aged 15 to 34) are now on the Database.^{xiii} Current legislation creates an enormous potential for a large proportion of Black and Minority Ethnic groups to be stigmatised and subjected to unnecessary surveillance, leading to (or exacerbating) a loss of trust in the police in these communities. Although controls on the Database alone cannot prevent bias and discrimination in the criminal justice system, they can limit the extent to which the Database is unfairly populated and used. Time limits on retention and a return to taking DNA on charge rather than arrest (except when needed to investigate a specific offence) would help to reduce the number of black men retained unjustifiably on the Database. Expanding the Database to include the whole population is unlikely to restore the trust of people already held on it unfairly, or to prevent it being used in a discriminatory way (see also response to Q4d).

- c. Is it acceptable that volunteers (such as victims, witnesses, mass screen volunteers) also have their profiles retained on the NDNAD? Should consent be irrevocable for individuals who agree initially to the retention of samples voluntarily given to the police? Are the provisions for obtaining consent appropriate? Should volunteers be able to withdraw their consent at a later stage?

Currently, volunteers may give consent for their DNA to be taken and used only for a specific investigation, or they may also agree for it to be retained indefinitely and for their DNA profile to be kept on the DNA Database. It is common for volunteers, particularly the victims of crimes, to be unaware of what they have signed. They are also not informed that their record on the Database and/or their DNA sample may be used for controversial genetic research without their knowledge or consent. Some volunteers later wish to have their DNA destroyed and to be removed from the Database, but then find that in England and Wales their consent is considered irrevocable. People asked to volunteer to take part in mass screens may also have concerns about the retention and potential misuse of their DNA and may lack sufficient trust in the police to take part in the screen.

In GeneWatch UK's view, current provisions for obtaining consent are not appropriate, as it appears to be very common for people to be unaware of what they have signed. Further, the use of profiles and samples for research is not mentioned during the consent process. As a minimum, volunteers should be allowed to withdraw their consent and have their DNA destroyed and profiles removed from the Database, a process that should be overseen by a new forensic regulator. However, it would be preferable to take volunteers' DNA only for the purpose of a specific investigation and to remove the provision for indefinite retention. This would achieve greater clarity and enhance trust in the police's use of volunteers' DNA.

- d. Would the collection of DNA from everyone at birth be more equitable than collecting samples from only those who come into contact with the criminal justice system? Would the establishment of such a population-wide forensic database be proportionate to the needs of law enforcement? What are the arguments for and against an extension of the database?

The National DNA Database is a useful tool in criminal investigations, but the permanent retention on it of everyone who has been arrested raises important concerns about privacy and rights, including:

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- the potential threat to 'genetic privacy' if information is revealed about health or family relationships, not just identity;
- the creation of a permanent 'list of suspects' – including anyone arrested in England and Wales since April 2004 - that could be misused by governments or made available to a much wider range of organisations in the future;
- the exacerbation of discrimination in the criminal justice system;
- the use of the computer database and DNA samples for genetic research without consent.

It is difficult to see how greater expansion of the Database could address any of these concerns. Records of entire populations (for example in Nazi Germany or communist Eastern Europe) have frequently been used to target minorities (including Jews, homosexuals, political dissidents and disabled people). Increasing the size of a Database offers no protection for minorities and does not prevent it being used in a discriminatory way – it is more likely to increase the risk of misuse by future Governments. In contrast, limiting access to sensitive information by the police and State (for example, by including time limits on retention) can restrict the opportunities for misuse.

Neither the police nor Government officially support the inclusion of the entire population on the Database. This is partly because costs are likely to be disproportionate to any impact on crime. The number of cases that can be solved using DNA will always be limited by the number of crime scenes from which DNA profiles can be collected and the need for corroborating evidence. The number of DNA crime scene profiles loaded on the Database has increased significantly during the DNA Expansion Programme, but is unlikely to increase much further because many types of crime do not have an obvious 'crime scene' and DNA is not left at all crime scenes. In 2003/04 the number of crimes yielding DNA either levelled off or decreased. Therefore, it is unlikely that DNA profiles are ever loaded from more than 1% of crime scenes. In theory, if everyone was on the Database, the DNA match rate (number of DNA matches per crime scene sample) could increase to 100% (assuming nobody escaped entry on the Database). However, the DNA detection rate (or conviction rate) would never be this high, because all matches will not lead to detections (or convictions). The figures suggest that there is a rapidly diminishing return from adding more individuals to the Database (see Table).

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Year	2002-03	2003-04	2004-05	2005-06
Number of individuals' DNA profiles on NDNAD†	2,099,964	2,371,120	2,802,849	3,534,956
DNA detections	21,098	20,489	19,873	20,349
Recorded crimes	5,920,156	6,042,991	5,623,263	5,556,513
DNA detection rate	0.36%	0.34%	0.35%	0.37%

† These figures include some repeat records (an estimated 10% of the total).

Sources: NDNAD Annual Report 2002-03^{xliii}; Home Office^{xliv, xlv}; Hansard^{xlvi, xlvii}.

These figures are determined largely by volume crimes (such as car theft) and a detailed evaluation of the impact of the Database on violent or sexual crimes is unavailable. However, retaining individuals on a DNA Database is also generally less useful for detecting violent or sexual crimes than volume crimes because:

- the perpetrators of violent crimes are usually known to their victims so the Database is then unnecessary to identify a list of suspects;
- the DNA of the victim (for example, in a bloodstain) is usually much more relevant to establishing who committed a violent crime than the DNA of potential suspects;
- for rapes, the issue of whether the woman consented (which cannot be resolved by DNA) is more often disputed than the identity of the man involved.

Although, theoretically, existing blood spot cards (Guthrie cards) taken from babies at birth could be used to establish a DNA Database, this would also be costly (blood spots are currently analysed only for a few conditions and do not exist in the form of a searchable DNA database). A more detailed genetic analysis of the blood spot cards is not justifiable on medical grounds and the profiling of this DNA purely to establish a police database would also breach existing rules for medical consent.^{xlviii} It seems unlikely that the medical profession would be willing to collect DNA at every birth for this purpose, particularly because mothers who refused consent to the blood spot being taken might jeopardise their baby's health. Putting mothers in this difficult position would be ethically unacceptable.

5. The evidential value of bioinformation

- a. What should be done to ensure that police, legal professionals, witnesses and jury members have sufficient understanding of any forensic bioinformation relevant to their participation in the criminal justice system?

The limitations of DNA evidence are not widely understood. In addition, new techniques introduce new potential sources of error. For example, the increasing use of Low Copy Number (LCN) DNA analysis – which allows a DNA profile to be extracted from a single cell – has led the Director of the Forensic Institute in Edinburgh to warn that innocent people may be wrongly identified as suspects as a consequence of being on the National DNA Database^{xlix} and the judge in the Omagh trial to criticise specialist evidence on this technique as contradictory.¹ LCN analysis and other new techniques such as “DNABoost”,ⁱⁱ increase the sensitivity of DNA analysis (allowing very small samples or mixed samples to be analysed, respectively) but also increase the chance of a false

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match between a scene of crime DNA sample and an individual's DNA profile. These difficulties may be exacerbated when these techniques are combined.ⁱⁱⁱ Commercial pressures may also lead forensic service companies to exaggerate the benefits and downplay the limitations of such new techniques.ⁱⁱⁱ

A new independent regulator is needed to assess the limitations of forensic evidence. If such a regulator existed, it could also provide guidance and education to the police and legal system.

- b. How much other evidence should be required before a defendant can be convicted in a case with a declared DNA match? Should a DNA match ever be taken to be sufficient to prove guilt in the absence of other evidence?

The weight given to DNA evidence will depend on the context, including a realistic appraisal of the limitations of the DNA evidence provided. It is difficult to envisage circumstances where DNA evidence alone would be sufficient to secure a safe conviction, since the possibility of a false match will always exist.

6. Other issues

- a. Are there any other issues, within our terms of reference, which we should consider?

Although this consultation is welcome, it cannot replace the need for public and democratic debate on this important issue. People on the Database, amongst others, should be able to have a say about the retention and uses of their genetic information. GeneWatch UK has sought to encourage members of the public who have contacted us to respond to this consultation, however it is difficult for many people to access, read and input to what is a rather technical and remote process. Further, people may feel that policy makers are not obliged to respond to any concerns which they may raise.

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