

Nothing to hide, nothing to fear?

Balancing individual
rights and the public
interest in the
governance and use
of the National DNA
Database

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Genetics Commission
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Chair's foreword

Britain has the largest forensic DNA database in the world in proportion to the size of its population. It is estimated to contain the DNA profiles of over 8 per cent of the UK population. For some groups this is much higher: the profiles of over three quarters of young black men between the ages of 18 and 35 are recorded. Currently, anyone arrested for a 'recordable offence' in England and Wales can have their DNA taken and retained indefinitely.

The National DNA Database provides the police with an important investigative tool to identify suspects for a variety of crimes including the most serious, such as rape, murder and terrorist offences. In some cases, the database is the only means by which a suspect can be identified and brought into an inquiry.

The UK Parliament has never actually debated the establishment of the database as such – it came about through amendments to legislation that was originally designed to codify powers and duties of the police at a time before 'DNA fingerprinting' had been invented. Since then, many groups and individual members of the public, as well as the Human Genetics Commission (HGC), have expressed concerns about the police's powers to keep and use DNA samples, and the profiles derived from them, especially when no court has found them guilty of an offence.

Balancing personal privacy and public protection is not easy. The National DNA Database has now been the subject of a judgment from the European Court of Human Rights that strongly criticises the way the UK has tried to strike this balance. The UK must now decide how it will respond.

The HGC has a long-standing involvement with the National DNA Database and has watched over its development closely since 2001, in particular, listening to the voices of those whom the database primarily affects – UK citizens. This report contains the Commission's conclusions about how a proper basis and governance structure for the National DNA Database should be developed. It starts from the concerns expressed by members of the public about the database, and identifies, in the light of these, the conditions of acceptability for having a forensic DNA database.

I am grateful to the working group, led by Professor Steve Bain, for producing this report and trust that it will prove both interesting and useful to those who, as citizens, police officers, policy makers and legislators, need to understand and to resolve the difficult issues that the National DNA Database raises for all of us.



Professor Jonathan Montgomery
Chair, Human Genetics Commission

Summary and recommendations

The National DNA Database (NDNAD) was established in 1995 and now contains the DNA profiles of approximately five million UK citizens. There has been little concerted public opposition to the rapid growth of the database in the UK, although it cannot be inferred from this that all aspects of the database command widespread support. Through public engagement activities such as the 2008 Human Genetics Commission (HGC) Citizens' Inquiry and subsequent public consultation, we are aware of the existence of significant concerns that have never been fully addressed. These concerns are the starting point for our deliberations.

We consider the development of the database as the coming together of distinct developments in genetics science, police record-keeping and information technology (chapter one). We discuss the particular technologies in use and make the distinction between a biological sample and a DNA profile. We identify the danger that reliance on the use of the database as an investigation strategy could lead to irreversible evolutions in policing practice that make commitment to the database a *fait accompli*.

We consider the development of the legislative conditions for the database, principally by successive amendments to the Police and Criminal Evidence Act 1984 (chapter two). We find that the purpose of the database has altered over time and has never been stated in sufficiently clear terms. We discuss the case of *S and Marper v. The United Kingdom* and identify two limit cases (a database comprising profiles of only convicted offenders and a whole-population genetic database). We describe the problem of justifying any middle path (i.e. holding profiles of some, but not all, people who have not been convicted) as a challenge to the legal 'presumption of innocence' on the one hand or, if this can be overcome, to the evidence that would distinguish individuals on the basis of the risk they pose to society. In order to provide clarity and control of the purpose of the database **we recommend that the National DNA Database should be established in law through new primary legislation. The permitted uses of the records constituting the National DNA Database should be simply, unambiguously and explicitly defined in legislation, and any use of the database that falls outside those permitted uses should be made an offence subject to strict penalties. Any provision made for amending those uses through delegated legislation should be limited in scope in the primary legislation.**

We examine expressed attitudes to DNA and genetic information (chapter three) in order to understand why people might feel that holding DNA profiles on a forensic DNA database is a particular interference with their privacy. We consider four ways in which genetic information might be seen as exceptional compared with other sorts of information. We examine the argument that those who have nothing to hide have nothing to fear from the NDNAD and examine possible harms including the risk of adventitious matches, inadvertent discovery of unknown biological relationships, and

breaches of data security. The claim that those whose profiles are retained are in a distinct relationship with the state amounting to ‘genetic probation’ is discussed. **We recommend that the legislation that establishes the National DNA Database should be accompanied by a full privacy impact assessment with advice from the Information Commissioner, so that these impacts can be considered when the legislation is debated openly in Parliament.**

We examine the social consequences of the NDNAD, in particular its disproportionate effect on certain sections of the population including young people, black and minority ethnic groups, and people with mental health problems. **We recommend that new guidance is given on when it is appropriate to take a DNA sample following arrest and to record a resulting DNA profile on the National DNA Database; the guidance should have regard to the circumstances of the arrest (including the nature of the offence of which the arrestee is suspected).** Furthermore, we recommend that an independent panel reviews, at regular intervals, evidence relating to arrests and the taking of DNA samples, in order to ensure that **(1) the guidance is sufficiently robust and (2) the guidance is being appropriately followed.** In order to ensure that the risk of stigmatising particular groups is minimised and attention is given to disproportionate impacts **we recommend that the legislation that establishes the National DNA Database should be accompanied by a full equality impact assessment so that these impacts can be considered when the legislation is debated openly in Parliament.** In order to express solidarity and to foster greater trust and co-operation between the police and the communities they serve **we recommend that all serving police officers, and those whose professional duties require or permit them to come into contact with crime scenes or crime-scene samples, should have their DNA profiles recorded on the Police Elimination Database and retained; this requirement should be a condition of employment.** We consider the position of those who ‘volunteer’ to provide profiles for inclusion on the NDNAD and agree with other commentators that consent should be freely given and capable of being withdrawn. **We recommend that the statutory framework for the National DNA Database should include provisions relating to consent which, as a minimum, should make it unlawful for records derived from volunteer samples to be retained in the absence of a validly obtained and subsisting consent.**

We consider the suggestion that a whole-population database would provide a solution to the disproportionate representation of certain groups under the current arrangements but remain convinced that the need to avoid discriminatory consequences is not in itself a sufficient reason to institute a whole-population database.

Having concluded that the balance of argument is against the general threat of crime as a justification for retaining DNA profiles from unconvicted people in general, we discuss how the usefulness of the database as a tool to identify offenders might provide a justification for retaining profiles from those most likely to offend (chapter four). Two problems with this approach are discussed: (1) how those at risk of future offending can be so reliably

identified as to licence a prospective interference with their privacy and (2) defining and evaluating the ‘forensic utility’ of the database as an investigative strategy. We suggest how a definition of ‘forensic utility’ should be approached and the measures that are needed to ensure it is properly evaluated. **We recommend that the National DNA Database Strategy Board should define and consult widely on an appropriate definition and acceptable measures of forensic utility. These should support the evaluation of the role played by the National DNA Database in the identification of offenders, while making it feasible to collect prospectively the evidence necessary for the evaluation in an operational context.** Given the gravity of the consequences of basing decisions about the scope of the database and the retention of individual profiles on their utility in crime management, public and independent scrutiny are necessary. **We support the efforts that are currently being made by the National DNA Database Strategy Board to identify and provide meaningful information that can be placed into the public domain, and we recommend that data supporting evaluation of the forensic utility of the National DNA Database should be collected and published by the National DNA Database Strategy Board or the National Policing Improvement Agency National DNA Database Delivery Unit. An evaluation of such data should be conducted by an independent body and placed in the public domain.**

We consider arguments for the retention of biological samples after a DNA profile has been extracted from them. We do not find any of these convincing and, in any case, they are far outweighed by the concerns already identified about the further uses to which they may be put. Therefore **we recommend that there should be a move towards the destruction of subject samples when profiles have been loaded to the National DNA Database; and that the UK should continue to support efforts to standardise sets of markers with other countries in Europe and elsewhere with whom the sharing of data for criminal intelligence purposes may be desirable.**

We turn to the future (chapter five) and consider ways in which the utility of the database might be increased: by increasing the size or improving its composition, by the introduction of new technologies for analysing samples and protecting individual privacy, and by introducing enhanced approaches to data mining. We identify the potential for both beneficial and harmful ‘function creep’ and for ‘function leap’ that would involve co-opting the NDNAD to an ulterior and more urgent purpose. We consider briefly changes in social conditions that might make this either more likely or more tolerable. We consider sharing and linking data both with other databases and with forensic databases in other jurisdictions, and **we recommend that robust processes should be developed to control international data sharing and that these should be subject to appropriate monitoring** in order to ensure that (and to determine whether) the necessary data, and no more, is being shared or exchanged.

We reiterate our view (chapter six) that holding the DNA records of innocent people fundamentally alters how suspicion, guilt and innocence function in the relationship between the citizen, society and the state.

We recommend that the Government supports continuing national debate, informed by the publication of relevant evidence, that addresses explicitly the extent of and justification for the interference with personal privacy inherent in retaining personal DNA profiles. The debate should address the basis on which a distinction may be made among unconvicted individuals so that the collection and retention of DNA profiles of some of them, but not all, would be acceptable. Whatever measures are put in place in the interim to comply with the *S and Marper* judgment we recommend the establishment of a **Royal Commission on the National DNA Database to give focus to, and to learn from, the public debate, and to ensure that its outcomes will be taken forward** and reflected in future framework legislation. We confirm the conclusions of our Citizens' Inquiry that there is a need for better understanding of the role of DNA in police investigations, to foster increased trust and co-operation between the public and the police. **We recommend that more, and more reliable, information about the National DNA Database is made widely available, in particular evidence of its usefulness in investigating crime and leading to the conviction of offenders.** To represent the different perspectives that people have and the values that people bring to bear when discussing the NDNAD we identify six 'ideal types' that we have abstracted from our various public engagement activities. Having distinguished these types we identify the principles that they share in common and the key point of divergence – the challenge the NDNAD represents to the presumption of innocence.

Finally, we set out some practical measures to improve the governance of the database. While we appreciate the efforts made to increase openness by the NDNAD Strategy Board, nevertheless **we recommend that an independent body be established to oversee the management and use of the National DNA Database, and that this body should conduct its business in an open and transparent way to the fullest extent that the operational sensitivities of policing will allow.** In order to ensure that proper consideration is given to requests to remove DNA profiles from the database **we recommend that clear and explicit rules for the removal of samples/profiles from the database be drawn up so that consideration and, if necessary, argument can be addressed to whether a given case falls under that rule.** Consistently with our other recommendations concerning the establishment of the database in law, **we recommend that these rules should be stated in primary legislation.** To ensure that these rules are properly implemented and to reduce the barriers (of difficulty and cost) currently faced in securing removal of DNA profiles from the NDNAD **we recommend that an independent body be empowered to consider appeals against rejection by a Chief Officer of an application to remove a DNA profile from the National DNA Database.**

A key finding in relation to the evidence surrounding the NDNAD is that there is currently insufficient evidence available to demonstrate its forensic utility, certainly to the extent that its proven usefulness might justify greater intrusions into individual privacy. We are particularly concerned that no deliberate and appropriate efforts appear to have been made to redress this

prospectively. Therefore **we recommend that the National DNA Database should have in-built reporting systems properly designed with the assistance of those with appropriate academic expertise to provide information necessary to demonstrate forensic utility and for equality and privacy impact assessments.** In order to ensure that the evidence is brought to bear on NDNAD profile retention policy as it emerges **we further recommend that an annual review be undertaken, informed by the reporting systems we have recommended, of the forensic utility of the National DNA Database and that the review should draw out strategic and policy proposals for the management and use of the database.**

Finally, given the enormous significance of the ethical issues raised by the database, and particularly its role in approving research using the database, **we recommend that the National DNA Database Ethics Group be placed on a firmer footing; members should be remunerated (as for the majority of other public bodies), and the secretariat strengthened to support its work. Its independence from the Home Office should also be increased, as should its capacity to review and authorise research applications.**

Introduction

The DNA molecule is present in virtually every one of our body's cells. The fact that we all share DNA and that this varies between individuals is of great significance: DNA both makes us unique and relates us to our family and other human beings. Not all – or even most – DNA is 'coding DNA', comprising the genes that control the body's biological processes; indeed, most of the regions that show the greatest variability from person to person are the non-coding sections. Although our environment plays a significant and equally important part in the development and formation of our individual characteristics, the features of DNA – that it is unique to each individual,¹ that it is stable over time, and that it is susceptible to reliable analysis – make it the most powerful means of identifying and differentiating individuals so far discovered.

We lose cells from our bodies constantly. This is part of the body's natural process of maintenance and renewal. These cells are shed freely from the skin, but are also found in blood, saliva, semen, and other bodily secretions. Using sensitive forensic techniques of recovery and analysis, cells and DNA fragments can be found almost everywhere until they are broken down by natural processes, or cleaned away. The fact that DNA can be found in all people and the places those people have been, makes DNA analysis very useful for police investigations. The development of techniques that allow the accurate creation of an individual 'DNA profile' from any given biological sample has made possible its routine use to link samples found at crime scenes to suspects.

Recognising the value of DNA profiles in identifying suspects for unsolved or future crimes, the police began keeping profiles and combining them into searchable records. From 1995, these records have been held on the National DNA Database (NDNAD) in England and Wales, which has grown to become the largest (in proportion to the national population) forensic DNA database in the world.

While the benefits of identifying and prosecuting criminals are undisputed, some aspects of the way in which this is achieved through the NDNAD have given rise to concerns. As we have observed, a person's DNA is personal to them – it can be both identifying and revealing – and its use by others can constitute a harmful interference in their private life. This was recognised in the UK by the creation of a criminal offence of 'DNA theft' following a recommendation from the Human Genetics Commission.² Most people accept that there needs to be a balance between protecting the public from criminal behaviour and the interference with personal privacy involved in taking and keeping people's genetic information. However, there is significant space for debate over where this balance should be struck and about what constitutes a good reason for the state to hold sensitive personal information about individual citizens, especially those who have committed no crime.

Throughout the time during which the NDNAD has been growing to its present size there has been little concerted public opposition. However, it cannot be concluded from this that the growth of the database commands positive and widespread public approval. For one thing, despite a growing number of official reports, media stories and court cases, there has been relatively little public debate, and the database has never itself been the subject of a vote in the UK Parliament. Consequently, there has not been adequate opportunity to examine the ‘good reasons’ for the state to hold personal genetic information, and to put these reasons to the test.

The Human Genetics Commission (HGC), as well as other bodies, has encouraged debate in this area. The HGC’s involvement with the NDNAD began soon after the Commission was established. In 2001, Commissioners visited the Forensic Science Service to learn about the governance of the database. This was followed by recommendations in the HGC’s first report, *Inside Information* (2002), that the database should be subject to independent oversight. This led to the involvement of HGC Commissioners as members of the NDNAD Strategy Board and was followed, somewhat later, by the establishment of an Ethics Group for the National DNA Database. The HGC has also held several meetings with representatives from the NDNAD Strategy Board and the Home Office, and kept the NDNAD firmly on its agenda through its Identity Testing Monitoring Group, which has responded to a number of Government consultations and Parliamentary inquiries.³ In 2005, following a period of rapid expansion of the NDNAD, the decision was made to seek funding for a public dialogue exercise to identify and explore public concerns about the enlarged database. A working group was established involving partner organisations with complementary expertise that led to the commissioning of a Citizens’ Inquiry in 2007.

We are aware of a growing and significant body of commentary and historical analysis of the NDNAD by other bodies and individuals.⁴ In most cases, we find ourselves supporting their recommendations and compounding their arguments. We do not intend to duplicate their research: while we will draw on these sources in setting out our arguments in this report, our starting point will be the concerns aroused in UK citizens by the existence of the National DNA Database, the grounds from which these concerns arise, and how they develop when immersed in a richer environment of information and dialogue. Our principal purpose in writing this report is to draw attention to these concerns and to indicate how we think they should be addressed. That they should be addressed is our principal assertion: the NDNAD, and the effective prosecution of criminal justice more generally, depend on the trust, confidence and support of UK citizens.

We recognise that perceptions about the NDNAD are strongly influenced by the media. It is one of our conjectures, which we will explore in the report, that lack of reliable, publicly available information about the NDNAD has made an open and rational debate difficult, and has perpetuated uncertainty about its fundamental purpose. The use of DNA to ‘solve’ high-profile crime is reported in the press and broadcast media in highly emotive terms. Individual case histories are presented in place

of systematic evidence in public statements ranging from political speeches to proceedings before the highest courts. These anecdotes describe the use of DNA evidence both to produce otherwise unlikely detections and to reveal miscarriages of justice. On the other hand, over-confidence in the power of DNA always to produce a definitive answer means that the limitations of DNA-based techniques can produce disappointment and bewilderment. This over-confidence has been engendered to a large extent by the way in which real-life events are reflected and exaggerated as entertainment, for example in popular television dramas. While they provide common reference points for organising people's views and concerns, we do not think that the focus on individual cases, whether real or fictional, in the absence of systematic evidence has helped the debate.

The Citizens' Inquiry into the National DNA Database was commissioned by the HGC with partners the Economic and Social Research Council Genomics Policy and Research Forum in Edinburgh, and the Policy, Ethics and Life Sciences (PEALS) Research Centre in Newcastle.⁵ The purpose was to provide an environment in which participants could develop and examine their own views about the NDNAD, enrich them with additional information, and debate them together in an environment of mutual respect and shared inquiry. From the outset, the commissioning group agreed that the shape of the project should be determined by the participants: by their information needs, by the nature of their concerns, and by their preferred ways of engaging with the issues and with each other.

For six weeks, two panels in Glasgow and Birmingham, linked by video, heard from representatives of interest groups, the police, database governance bodies, forensic scientists and journalists. The weekly sessions were followed by regional visits to the Scottish Parliament (to question MSPs from the main political parties) and to a community centre in the London Borough of Hackney (to hear from people with first-hand experience of having the police take biological samples). In March 2008, the two panels came together over two weekends to discuss their experiences and to bring together their conclusions. On 13 May 2008, the panellists travelled to London to meet the Human Genetics Commission and to present their findings. The report of this Citizens' Inquiry, launched simultaneously in Glasgow and London on 29 July 2008, provided insight into the perspectives, anxieties, and areas of knowledge and lack of knowledge, of a diverse group of citizens. It also highlighted the concepts and language through which they articulate and debate them as well as giving a strong indication of the directions in which those citizens felt that action needed to be taken.

In this report we reflect on some of the outcomes of the Citizens' Inquiry. When the Inquiry concluded, we launched a wider public consultation to seek comments on the Inquiry's findings and on ten specific questions that seemed to us to be the most important raised by it.⁶ You will also find responses to this wider consultation guiding and provoking our reflections in the body of the report.

In the first chapter of this report, we review some historical developments in the fields of policing, genetics and information technology that

combined to create the conditions for the implementation of the National DNA Database in England and Wales. We suggest that a failure to appreciate the novelty of this conjunction can lead to a failure to appreciate different ways in which the database is construed from different perspectives. This, in turn, can make inclusive and comprehensive debate about the issues difficult. We draw attention to the way in which the power and potential of the new technique of forensic DNA profiling can reorganise the resources of the disciplines that produce it (criminal justice, molecular genetics, information technology, for example) in a way that makes its adoption more probable and can diminish the attention and resources given to alternative approaches.

In chapter two, we examine the purpose of the database insofar as this can be identified from the legislation and records of official decisions that provide for it, or discerned empirically from its use. We show that there is a lack of conceptual integrity, which has led to uncertainty about its purpose. In turn, this has allowed an expansion of its functions and created difficulties in ensuring accountability, although governance structures have been developed after the fact. We recommend that the equivocation should be resolved by a clear definition of the database's purpose.

In the third chapter, we examine the consequences, both experienced and implied, of the NDNAD for individuals and society. We argue that the existence of the database affects significantly the interests both of those individuals who are recorded on it and of those who are not (yet) recorded, and that these should be matters of significant concern to the whole of society. In doing so we examine the concerns expressed during our engagements with the public.

In chapter four, we look at how the utility of the database should be evaluated, and what importance should be attached to this evaluation. We conclude that utility is difficult to estimate given the lack of a clear definition of purpose and the necessary evidence to demonstrate fulfilment of purpose. We suggest how this might be redressed in future by the planned, systematic collection of data and an appropriate programme of evaluation and interpretation.

In chapter five, we look to the future of the database and examine ways in which the utility of the database might be increased. We look at the most recent and proposed expansions of its use, including techniques such as defining more discriminating search strategies and extracting information from coding sections of DNA. We also try to think beyond current limitations of the database in terms of technical, social and legal obstacles, and imagine leaps in function that would allow the NDNAD to be used for other purposes. We consider, too, the implications of access to the rapidly growing repositories of personal genetic information for criminal justice purposes and the consequences of sharing and linking data.

Finally, in chapter six, we examine how, given the present and likely future utility of the database, its potential adverse consequences can be minimised.

Working within a horizon of ten years into the future, we make recommendations relating to the governance and accountability of the database.

We believe that this report is timely, given the necessity of imminent legislation to bring the database into line with human rights law and the Government's intention to make new legislation affecting forensic science generally. We hope that it will be a valuable contribution to forthcoming debates around the NDNAD and the forensic use of genetic information in the UK.

Notes

1. 'Identical' or monozygotic twins share the same DNA because they began as one embryo (with DNA from the same egg and sperm) that split soon after fertilisation, when the embryo comprised only a few cells, and subsequently developed as two separate individuals.
2. The offence is taking or having an individual's biological sample with the intention to analyse their DNA without their consent. It was introduced by the Human Tissue Act 2004 and the Human Tissue (Scotland) Act 2006. The introduction of this offence followed a recommendation in the HGC's report *Inside Information: Balancing interests in the use of personal genetic data* (HGC, 2002).
3. For example, the House of Commons Science and Technology Committee Inquiry *Forensic Science on Trial* (2005), the Scottish Executive's proposals on the collection and retention of DNA samples and fingerprints in Scotland (2005), Home Office consultation on 'Standard setting and quality regulation in forensic science' (2006), Home Office consultation on 'Modernising Police Powers' (*PACE Review: 2007*), the House of Commons Home Affairs Select Committee Inquiry *A Surveillance Society?* (2008), The (Scottish) Forensic Legislation Review ('Fraser review': 2007), and the Scottish Government's *Consultation on the Acquisition and Retention of DNA and Fingerprint Data in Scotland* (2008a). All of these are available to view via the HGC website: www.hgc.gov.uk.
4. In particular, we have benefitted from the excellent contributions of Professor Robin Williams and colleagues (Williams et al. (2004); Williams and Johnson (2008)) and the thoughtful and comprehensive treatment of the ethical background by the Nuffield Council on Bioethics (2007) as well as a number of timely and incisive reports by parliamentary committees (for example, House of Commons Science and Technology Committee (2005); House of Commons Home Affairs Select Committee (2008); House of Lords Select Committee on the Constitution (2009)).
5. The project was supported with funding from the (then) Department for Innovation, Universities and Skills' Sciencewise programme and the Wellcome Trust.
6. The consultation document and responses may be viewed via the HGC website: www.hgc.gov.uk

Chapter one

The beginnings of the National DNA Database: measuring, recording and interpreting

“I took one look, thought ‘what a complicated mess’, then suddenly realised we had patterns ... There was a level of individual specificity that was light years beyond anything that had been seen before. It was a ‘eureka!’ moment. Standing in front of this picture in the darkroom, my life took a complete turn.”

— Professor Sir Alec Jeffreys¹

Introduction

- 1.1 The development of the technique of genetic profiling in the 1980s, its early successes in identifying suspects and its subsequent effectiveness in bringing criminals to justice are all well documented.² The history of the National DNA Database (NDNAD) is less well described; this is partly because its origin is difficult to define, its development characterised by composite transitions rather than clear decisions, and its purpose never clearly and publicly specified. It is also, perhaps, because the information it contains is highly confidential and some information about the database is operationally sensitive. Perhaps, too, discussions about the NDNAD are difficult to broach without becoming entangled in complex arguments about human rights, civil liberties and the relationship between the citizen and the state.
- 1.2 In this first chapter we will examine the pre-history of the NDNAD and how it should be understood in terms of its origin, purpose, constitution and consequences. We will note conceptual tensions between important aspects of the database including the different perspectives of the groups, authorities and institutions that create, use and populate it and we will begin to indicate how we think these might be resolved.

Measuring

- 1.3 The use of personally identifying bioinformation – information obtained by the analysis of biological characteristics – has been institutionalised in the investigation of crime in various forms since the nineteenth century. The first use of bioinformation, both logically and historically, was to establish identity by comparing two sets of information and, equally importantly, to distinguish two sets of information in order to avoid mistaken identity. For this, the information must have the quality of particularity, which includes the elements of variability within the population (i.e. from person to person) and stability in one person over their lifetime.
- 1.4 The first forensic comparisons were carried out using a suspect's physical appearance as a marker and relying on the memory of police agents to make the identification. This began to be systematised in the nineteenth century with the introduction of methods to train and apply the memory for the purpose of police identification.³ We could say that the modern history of forensic policing begins with measurement: forensic science first entered police procedure when the information used to establish identity became measurable. While external physical appearances are easily detectable they are also subject to alteration, both natural and deliberate. To get around this limitation, Alphonse Bertillon (1853–1914) developed a system of identification, which he called 'anthropometry'. It involved taking 11 bodily measurements using a set of specialised instruments. These produced a set of data that was practically unique to each person and relatively stable throughout that person's life. His system was

immediately influential. By introducing scientific measurement – biometrics – Bertillon’s system had advantages beyond the reliable measurements on which it was based: it was also recordable and communicable. This meant that a system of records – an identification database – could be built up and accessed by different people at different times.

- 1.5 Alongside the introduction of scientific measurement in the form of the Bertillon system, the science of fingerprints (‘dactyloscopy’) was emerging as another promising source of bioinformation for identification. In England, important early work was carried out by Francis Galton, who established the particularity (the hypervariability and stability) of fingerprints and produced an influential classification of fingerprint patterns. Galton wrote of the papillary ridges that form the fingerprints: “They have the unique merit of retaining all their peculiarities unchanged throughout life, and afford in consequence an incomparably surer criterion of identity than any other bodily feature.”²⁴ Galton, whose reputation is tainted by the association with the eugenics movements of the late nineteenth and early twentieth centuries, revealed another motive for his interest in fingerprints: “They may be made to throw welcome light on some of the most interesting biological questions of the day, such as heredity, symmetry, correlation and the nature of genera and species.”²⁵ Concerns such as these continue to haunt our attitudes towards biometrics.
- 1.6 At the beginning of the twentieth century, as the science of fingerprints, comprising systems for their classification and measurement, was developing through the work of forensic criminologists, the Home Secretary of the day appointed a committee to enquire into methods for the ‘identification of criminals by measurement and fingerprints’, which led to the definitive replacement of Bertillon’s anthropometric system with fingerprint comparison. Fingerprints have one clear and obvious advantage over the Bertillon system: as well as particularity and measurability, fingerprints also have the quality of involuntary availability. As techniques were developed that allowed them to be found at the scenes of crimes, they were no longer useful simply in order to confirm that a person present on two occasions was the same person, but also to link a person to a trace or imprint that they had left behind. This represented a significant development: whereas Bertillon’s record cards simply recorded an identifying combination of features of known criminals, matching an individual to a crime-scene trace allowed the production of suspects from a population.

Recording

- 1.7 Bioinformation, however accurate the measurement, is of extremely limited use for the purposes of identification without an infrastructure that allows it to be recorded, preserved and retrieved. Following the Belper Commission Inquiry that resulted in the adoption of fingerprinting as the preferred means of criminal identification, a dedicated Fingerprint Branch was established at

Scotland Yard in 1901. By October 2008, the IDENT 1 database gave police day-to-day access to about 7.8 million individuals' fingerprint records.⁶

- 1.8 The modern system of collecting criminal records began in 1869 and prison records from the late eighteenth century are still available today in the UK. It is worth noting that the criminal records created by the police have an increasing number of functions at ever greater distance from the original rationale for their creation. As well as assisting the police in investigating crime and the judiciary in deciding suitable punishments, they are used by other parts of the criminal justice system, such as prison and probation services, and, increasingly, by external agencies, especially for pre-employment checks for jobs that involve working with children or vulnerable adults. The transfer of information from domestic criminal records for criminal justice purposes in other jurisdictions is also increasing and positively encouraged.⁷ This is not unique to criminal justice records but is an aspect of the familiar and widespread phenomenon of linking repositories of information from different sources held in electronic form using standardised electronic information transfer protocols, and increasing the range of different professional groups that have access to them for a broader number of different purposes. This makes the information or evidence base more powerful and it is not surprising that this phenomenon is influencing the collection, storage, synthesis and retrieval of criminal and other records. However, this process also presents a number of problems, some familiar and some novel.

DNA 'fingerprinting'

- 1.9 The technique of DNA fingerprinting was first developed by Professor Sir Alec Jeffreys and colleagues at the University of Leicester in 1984. Professor Jeffreys realised that repeated sequences of DNA or 'minisatellites' – where a short sequence of DNA is repeated many times – could be exploited to determine individuality. Minisatellites are dispersed within the non-coding regions of DNA (those that do not carry instructions for making proteins) and while the repeated DNA unit is present in different individuals in the population, the number of times the unit is repeated varies greatly from person to person.
- 1.10 These first DNA fingerprinting techniques required the DNA from a sample to be digested with an enzyme that cuts the DNA at predictable sites and produces small pieces of DNA. The pieces of DNA are separated according to their size by electrophoresis – a technique whereby the pieces of DNA are forced to move through a gel which has very small holes within it: the smaller pieces of DNA move more easily through the holes in the gel and so reach the other end of the gel before the larger pieces. The result is a 'ladder' of DNA fragments, sorted according to size, with some of these fragments containing minisatellites. A probe with a radioactive label attached is used to determine the position of the minisatellite-

containing DNA fragments in the gel. The probes were originally designed so that they would bind to a sequence of DNA within many minisatellites, so one probe could determine the position of many minisatellites. In later DNA fingerprinting techniques, the probes were made more specific so that they would only bind to one minisatellite. Since the precise position of a band in the gel would be dependent on the number of repeats an individual has in that minisatellite, comparisons could be made between samples from two sources to see if the size and distribution of the bands matched. Professor Jeffreys immediately recognised its potential criminal justice applications.⁸

- 1.11 The technique of DNA fingerprinting initially developed by Jeffreys and colleagues, while highly discriminating, took a long time to carry out, limiting its usefulness as a tool in criminal investigations. In addition, there was often too little biological material recovered from crime scenes to enable the technique to be used successfully. The development and refinement of the technique of polymerase chain reaction (PCR) in the late 1980s, which revolutionised molecular biology, overcame both of these problems. PCR is much more successful with shorter pieces of DNA but it cannot successfully amplify sequences of DNA of the length of the minisatellites used in Jeffreys' early DNA fingerprinting. The discovery, at the end of the 1980s, of smaller 'microsatellites' (or 'short tandem repeats' – STRs), distributed randomly throughout the genome, allowed PCR technology to be applied to DNA fingerprinting. STRs are much shorter than minisatellites (the repeating sequence is only 2–6 nucleotides as opposed to 7–30 nucleotides) and the unit is repeated up to a hundred times rather than thousands of times. Because STRs do not show the same level of interpersonal variability as minisatellites a larger number of STRs were needed to achieve levels of discrimination similar to those achieved using minisatellites. However, this is not a significant obstacle as STRs are dispersed extensively throughout the genome, in both the coding and non-coding regions (STRs selected for DNA profiling are from non-coding regions of the genome) and PCR allows the investigation of multiple regions of the genome at the same time in the same reaction tube.
- 1.12 PCR is used specifically to home in on a short section of DNA containing the target STR, and accurately to replicate it in order to produce millions of copies of that piece of DNA. With this new DNA profiling technique it is no longer necessary to retrieve large quantities of bodily fluids from a crime scene in order to successfully produce a profile, as the amplification process of PCR enables a DNA profile to be produced when only a few cells are left at a crime scene (and, with even more refinements to the technology, a full profile can be obtained from DNA from just a single cell). The whole process can be performed in hours rather than weeks and this new process is also amenable to automation, allowing multiple samples to be analysed alongside each other. In addition, the newer technique

allows a numerical designation to be assigned to each piece of DNA, which makes the process highly suitable for integration with a searchable database.

- 1.13 The work of simplifying and automating the PCR technique using microsatellites so that it was suitable for use in criminal investigations was largely carried out by the Home Office Forensic Science Service (FSS).⁹ From 1987 the Biology Division of the Central Research and Support Establishment (CRSE) of the FSS was engaged in a DNA initiative with the three stated purposes of assuring rapid adoption of DNA profiling into casework analysis, providing training to operational staff to support this, and prioritising research and development of DNA profiling.¹⁰
- 1.14 The current profiling standard used in the UK is called SGM Plus ('SGM' stands for 'Second Generation Multiplex'). SGM Plus produces a profile of 20 numbers based on analysis of ten STR markers plus a sex marker. It is represented in the following format:¹¹

X Y 18 27 38 38 10 58.2 21 28.2 13 23 10.2 19 11 19 2 5 14 23 11.2 21

- 1.15 Based on the likelihood of each possible combination occurring, modified by a value that takes account of the fact that individuals in small sub-populations are more closely related to each other than randomly selected members of the general population, the probability of two people having the same SGM Plus profile is in the order of one in a trillion (1 in 1×10^{12}). There are reasons, however, why random or so-called 'adventitious' matches may occur more frequently than this, which we will consider further in the course of this report, when we address arguments for altering the choice or number of markers used.
- 1.16 From the perspective of particularity and measurability DNA analysis is the forensic methodology *par excellence*. However, despite rapid and significant advances, it remains technologically intensive, relatively time consuming and costly. These limitations are likely to prove to be contingent and we will consider, in chapter five, possible future uses unconstrained by such current and, we expect, transient considerations. However, DNA analysis is also surpassed by fingerprint analysis in at least one way – the ability to distinguish between monozygotic twins and between different people in a population who might, conceivably, share a DNA profile – and by eyewitness or CCTV observation in their ability to locate the presence of a suspect at a crime scene in time rather than merely (putatively) in space.
- 1.17 In a given investigation the modern police force has at its disposal potentially a wide range of forensic information, including eyewitness reports, fingerprints, CCTV camera images, and blood stains and traces of other bodily material, of which DNA is only the latest instance. These different kinds of evidence all vary in their reliability, particularity, measurability and availability: they do not in general

succeed each other in utility but remain alternative or complementary. Their utility in any one case will depend heavily on the context: on the nature of any samples at the crime scene, the presence and reliability of witnesses or CCTV camera images, the existence of prior records, the extent to which legislation permits collection, scientific analysis and use, and so on. This being the case, one might reasonably claim that DNA profiling has simply entered the repertoire of forensic techniques in what is, for the purposes of investigating criminal offences, a wholly beneficial and unobjectionable way.

- 1.18 A challenging finding, however, would be not merely that DNA analysis has entered the context of crime management and investigation but that its introduction has been able to shape the legal, operational and political context itself: the way that a decision to create a national DNA database can result in changes to police practice, to the likelihood and procedure of arrest, to decisions about which crimes are investigated, to the way crimes are committed and even to the sorts of crimes that are committed. The reason that this would be important, in our view, is that by shaping the context in which it is used, DNA-based forensic policing produces the conditions for establishing acceptance of its own legitimacy and for increasing the criminal justice system's dependence upon it. Once this is accomplished, arguments about the creation of these conditions become harder to have.¹² In other words, the feedback between technological development, policing practice and ethico-legal acceptability creates the conditions for further developments that, as we become committed to them in turn, take us progressively further away from the alternative approaches that were equally possible at an earlier stage. (To make this claim implies that there is a choice that can be made at each stage but that the range of options changes with each choice made – some become progressively harder to choose, some easier.) Making the right choices now is therefore an urgent and important task.
- 1.19 In response to our consultation, Liberty (the National Council for Civil Liberties) told us that it was “aware of anecdotal evidence that police may drop investigations if DNA evidence is not found at the crime scene.”¹³ While it is acknowledged that police forces may, for entirely proper and practical reasons, decide that greater effectiveness and efficiency is to be achieved by directing resources to those cases where DNA evidence is available, Liberty nevertheless comment that doing so “will necessarily skew any figures which aim to show the number of cases in which DNA is a factor in conviction.”¹⁴ Another correspondent, a retired senior police officer, wrote to the HGC about what he perceived as a cause for concern in relation to changes in the practice of arrest. He described his own early training, which emphasised the seriousness of depriving a citizen of their liberty by using the common law or statutory powers of arrest, and the preference, in the light of this, for alternative measures, such as reporting a suspect for summons by a magistrate, unless the offence was very serious or the suspect likely to abscond. Then he continued:

“It is obvious ... that the system I have described no longer prevails. It is now the norm to arrest offenders for everything if there is a power to do so ... It is apparently understood by serving police officers that one of the reasons, if not the reason, for the change in practice is so that the DNA of the offender can be obtained: samples can be obtained after arrest but not if there is a report for summons. It matters not, of course, whether the arrest leads to no action, a caution or a charge, because the DNA is kept on the database anyway.”¹⁵

- 1.20 This type of evidence is not unique, but is very difficult to verify through enquiry, examination of written documents or analysis of police arrest figures. However, as the website of the National Policing Improvement Agency (NPIA: the agency that has custodianship of the NDNAD) suggests: “This [the National DNA Database] is a key intelligence tool that has revolutionised the way the police work to protect the public, dramatically changing the way offenders are identified and convictions secured.”¹⁶ At the very least, therefore, we believe that there is reason to be cautious and to have an open and transparent debate that recognises the danger of the NDNAD becoming a self-validating tool, as well as the consequences that changes in policing practice in relation to obtaining DNA samples may have for individuals. (We shall return to these in chapter four).
- 1.21 The reason for looking at our subject in a historical context has been to show that while, from one perspective, the forensic use of DNA may appear to be a revolutionary innovation, one that certainly raises some novel issues, from another perspective it can be seen as a wholly predictable and linear progression, masking the potentially negative aspects. It should have been obvious that when DNA (with its high degree of particularity and availability) could be measured and analysed effectively and reliably, it would naturally take its place among forensic strategies for investigating crime. In drawing attention to this we are suggesting an explanation for the apparent dislocation between these perspectives that may account for the bafflement of some in the criminal justice system about why people feel the need to treat DNA evidence in special ways and the outrage, from others, about why it is grouped together with crime management and investigation strategies that are importantly distinct in their implications.
- 1.22 In the next chapter we will move from the introduction of DNA profiling into criminal investigation to the establishment of the National DNA Database as we look at the evolution of the legal conditions for the further development of forensic DNA technology and the expansion of its use in police investigations.

Notes to chapter one

1. Quoted in Giles Newton, 'Discovering DNA fingerprinting' (2004) from The Human Genome Wellcome Trust website: http://genome.wellcome.ac.uk/doc_wtd020877.html
2. See, for example, Williams and Johnson (2008).
3. In the first part of the nineteenth century, the colourful criminal-turned-policeman Eugène François Vidocq (1775–1857), first Director of the Paris Sûreté, is credited with introducing the systematic use of memory, casts of foot and shoe impressions, and a card-index record system to policing practice.
4. Galton (1892), p.2
5. *Ibid.* In fact, in his early life, Galton had shown an interest in other sources of bioinformation as possible support for his theories about heritability, including the pseudo-science of phrenology. While the original claims of phrenology are now thoroughly discredited, Galton's dual interest may serve as a metaphor to remind us of a troubling confusion of two ideas in the concept of bioinformation: that it may be both 'identity confirming' and 'identity revealing'. We will return to this theme again in the course of this report.
6. Source: NPIA website (www.npia.police.uk).
7. See Thomas (2007).
8. The first forensic application of this technique was to resolve an immigration dispute by showing the relationship between the son of a UK citizen of Ghanaian origin and his siblings in order to establish his entitlement to return to the UK. In 1986 the technique was used for the first time in a criminal case, which involved the rape and murder of two young girls in 1983 and 1986 in Leicestershire. Having obtained a confession from a suspect in the second case, the police sought Professor Jeffreys' help to establish a link with the first crime three years earlier, which showed a similar *modus operandi*. Comparing forensic samples from the two victims with blood from the suspect, the forensic analysis revealed that both girls had indeed been raped by the same man, but that that man was not the suspect they were holding in custody. Following confirmatory tests, the suspect was released and a mass screening operation was launched that took blood and saliva samples from more than 5,000 local men. This operation did not, however, lead to the identification of the killer. Colin Pitchfork the man finally convicted of the crimes, had bribed and persuaded a friend to impersonate him using false documents when giving a sample for the mass screening, which was carried out with the help of local doctors. It was only after the man was overheard describing this deception to workmates and this information was reported to the police that he and Colin Pitchfork were arrested. Pitchfork confessed and further DNA testing linked him to semen samples found on the victims. He was convicted in 1988.
9. Since 2005 the FSS has been a commercial, Government-owned company.
10. Williams and Johnson (2008), p.45.
11. This profile has been created for illustrative purposes only. The profile has the correct numerical structure of a DNA profile on the NDNAD but includes a few numbers (representing genetic repeats at a specified DNA sequence) that have not been observed and are not expected to be observed. It can be seen that some numbers have a decimal place in them: this is a correct genetic notation in this application, irrespective of whether they exist or not.
12. This negative, exclusionary and autopoietic feedback is one consequence of a phenomenon that Lynch and McNally refer to as 'biolegality' (see Lynch and McNally (2008)). Dr McNally defines 'biolegality' in her response to our consultation as "the co-production of biotechnology and legislation in the context of criminal justice. Biolegality refers to how developments in biological knowledge and technique are attuned to requirements and constraints in the criminal justice system, while legal institutions anticipate, enable, and react to those developments."
13. Consultation response 23 (Liberty).
14. *Ibid.*
15. Consultation response 54 (individual).
16. www.npia.police.uk/en/8934.htm

Chapter two

The evolution of the database: purpose and function

“It would be helpful to ascertain how this database was conceived in the first place and by whom. This would provide an insight as to whether the authority involved had produced a long term plan and how they saw the role of the public if any. Undertakings such as the NDNAD require that the public has trust in the government and their agencies to succeed. I suspect that this enterprise did not get off to a transparent start ...”

— HGC Consultative Panel Member

Introduction

- 2.1 In debate and in legislation, much attention has been paid to the acquisition of biological samples for DNA profiling, the conditions under which this may be done and the justifications that must be advanced for doing so. Much less has so far been paid to what happens to the profiles once obtained. The National DNA Database (NDNAD) has come about because such biological samples and subsequent DNA profiles, having been properly obtained and extracted, are then retained rather than discarded.¹ The conditions that led to the establishment of the NDNAD, therefore, correspond exactly to the provisions that allow the retention of DNA samples and profiles. The question of the acceptability of the database is therefore in large measure the question of the legitimacy of DNA profile retention.
- 2.2 In this chapter, we examine the development of the legal provisions that have permitted the creation and expansion of the NDNAD. We suggest that the way in which choices have been made – for the most part without open debate – has resulted in equivocation about the object and purpose of the database. From some perspectives, maintaining this equivocation may be more appealing than confronting a fundamental decision about the object of the database. This can be presented as a dilemma between two fundamentally different approaches. Failure to address this dilemma has allowed it to be taken out of the UK Government's hands by the European Court of Human Rights, which has now imposed a ruling with which the Government is committed to comply.²

What is the National DNA Database?

- 2.3 The NDNAD in England and Wales came into operation in 1995. Separate databases exist for Scotland and Northern Ireland, although both subject and crime scene profiles are routinely shared with the NDNAD.³ There is also a separate Police Elimination Database that contains records relating to those involved in the processing of crime scene and criminal justice samples so that they can be eliminated from an investigation, for example if their DNA has contaminated a sample to be analysed.
- 2.4 The NDNAD is populated by profiles from biological samples obtained from three principal sources:
- (i) samples found at crime scenes (for example blood, semen, skin – refinements of technology make it possible to use increasingly small samples comprising only a few cells);
 - (ii) samples obtained compulsorily from people who are arrested by the police (the police currently have the power to require anyone arrested for a 'recordable' offence to provide a DNA sample); and

- (iii) samples provided by ‘volunteers’, usually in order to exclude them from a criminal investigation (where, according to the conditions of the consent given, samples may be volunteered for use either only in a specific investigation, or included on the database in perpetuity).
- 2.5 Samples from categories (ii) and (iii) may be referred to as ‘subject samples’ since the identity of the person from whom they were obtained is known. Samples in category (ii) are known as ‘criminal justice samples’ (or ‘CJ samples’) as they were obtained by the police from suspects under the Police and Criminal Evidence Act 1984 (‘PACE 1984’). Samples in category (iii), though provided voluntarily and retained with the consent of the provider, cover a variety of cases including: victims of crime, participants in intelligence-led mass screens, those who have sought to be included on the NDNAD out of a sense of public duty, those who live in areas of endemic crime (and therefore wish to achieve early and non-intrusive elimination from frequent investigations), and those who believe they are at risk of being victims of ‘honour-based violence’ (so that they might be identified as the victims of future offences). There is controversy surrounding the conditions in which some ‘volunteer’ samples were obtained and the consent secured. The Government has now proposed⁴ that the profiles of volunteers should not be included on the NDNAD and existing volunteer profiles should be removed: a review of the policy on volunteers is being conducted, new consent forms are being developed with the help of the NDNAD Ethics Group, and profiles obtained for elimination purposes will not be loaded onto the NDNAD.
- 2.6 The police usually take samples from individuals using a mouth swab. The sample is then analysed in a laboratory as we described in the previous chapter and a numerical code (the ‘DNA profile’) is derived. This profile does not contain any information about any ‘phenotypic’ traits of the person who provided it (about their appearance or medical status, for example), except whether they are male or female. It serves simply as a code by which an individual can be identified. Currently, both the sample and the profile are routinely kept, although the terms under which this occurs differ between the different jurisdictions within the UK, and even more so between the UK and other countries. Following the European Court judgment, the Government has also proposed that the biological samples should be destroyed once the numerical profile has been obtained, although this is not a straightforward task and is estimated to require up to two years to accomplish.
- 2.7 The profile is used to match individuals recorded on the database to samples found at crime scenes. The DNA sample can be used for quality assurance purposes but it is also possible to carry out further analyses to obtain or infer additional information (such as a person’s eye colour or their likely ethnic background). These further analyses are not routinely carried out in police investigations at present, although we consider these and other possibilities in chapter five.

- 2.8 The profile information is generated and held by accredited DNA database suppliers – the laboratories who carry out the analysis of the samples to derive the profiles. The biological samples from which the profiles are obtained that are currently kept are also held by these laboratories, as they are required to be preserved in carefully controlled conditions. The suppliers, including the Forensic Science Service (FSS Ltd), are commercial companies and are not part of the police service.⁵ DNA analysis services are purchased by Chief Constables of the UK police forces.
- 2.9 The NDNAD itself, which was previously held by FSS Ltd, is, with effect from October 2009, held within the NDNAD Delivery Unit of the National Policing Improvement Agency (NPIA). Personally identifying information about people from whom a sample/profile is obtained – such as their names and addresses – is held on the Police National Computer (PNC). A subset of these details is transferred to create a ‘stub record’ on the NDNAD to which the DNA profile is attached.⁶ It is linking the information on the PNC with the genetic profiles on the database that provides the NDNAD’s operational value.
- 2.10 The NDNAD is very complex, created through particular processes and procedures that themselves have changed over time. For the purpose of this report, unless we indicate otherwise, we will use the term NDNAD to mean the class of all searchable records of DNA profiles, derived from analysis of samples obtained by the police, linked to personal, identifying information from the PNC.

Why have a DNA database?

- 2.11 A genetic profile derived from DNA analysis may identify an individual by confirming that two samples originated from the body of the same person, where the identity of the person from whom one of those samples originated is known.⁷ It may also reveal the existence, and in some cases the degree, of a biological relationship between two different people from whom samples have been taken.
- 2.12 Where an investigating officer has access to a DNA profile obtained from a crime scene and has a strong reason to suspect that a particular person is the offender in that case, there is clearly a good *prima facie* reason to take a DNA sample from that person to compare with the crime scene profile. A ‘match’ will provide strong support for claiming that the individual was present at the crime scene and, depending on the nature of the sample (blood, semen, etc.) and the circumstances in which it is found (under a murder victim’s fingernails, for example), may be strongly incriminating. If it is not to be considered incriminating, it will at least require that a plausible alternative explanation can be given for how the suspected individual’s DNA could be found at the crime scene.
- 2.13 Likewise, where there is a range of individuals who may all fall under suspicion of having committed the crime, there is also a good reason

to obtain DNA samples from each of them and to compare these against the crime scene profile. Doing so may give grounds to exclude some or all of them from the inquiry, particularly if it simultaneously includes one or more of them by generating a positive match. Without knowing anything else about the circumstances of the offence, DNA evidence shifts the balance of likelihood that an individual is implicated if their DNA corresponds to DNA taken from a crime scene. There are therefore good *prima facie* reasons to use DNA evidence in this way if it is available.

- 2.14 However, none of this supplies an equally good reason to retain a record of the DNA profile obtained from any of the suspects. The argument for retaining the DNA profile, and therefore for beginning to compile a DNA database, is instead based on the widely held belief that there is a reasonable likelihood that some people who have been suspected or found guilty of a crime during a previous investigation may be guilty of a crime currently being investigated or that may be investigated in the future. There is criminological evidence that supports this general premise, as we shall see in the next chapter. However, just as the police have an interest in retaining information, those once suspected of a crime may equally have legitimate reasons for not wanting their information retained. How useful it may be to retain that information, what weight should be given to the interests of the police, those whose information they hold and the general public (including those who are or may become victims of crimes), how the database should be populated, and whose records should be retained are therefore complicated questions.

From a database of offenders to a database of suspects

- 2.15 As the website of the NPIA states: “The core legislation that underpins the taking of samples and retention of DNA information is the Police and Criminal Evidence Act (PACE).”⁸ The Act, which became law in 1984 at a time when the state-of-the-art techniques of forensic bio-identification were fingerprint analysis and blood typing, established a legislative space with four degrees of freedom in relation to which subsequent legislative developments can be plotted: (1) the nature of the sample taken, (2) the seriousness of the offence under investigation, (3) the level of suspicion and (4) the grounds required for continued retention. The opportunity for thorough parliamentary debate about the conditions for the establishment of the NDNAD was therefore limited to this core legislation, at a time when the forensic use of DNA was unknown.
- 2.16 Firstly, the PACE legislation distinguishes between intimate and non-intimate samples.⁹ In the Act as originally drafted, intimate samples referred to substances such as blood, urine, semen and any sample originating from a bodily orifice; non-intimate samples included hair (other than pubic hair), samples of nail clippings or from beneath nails, and swabs from any part of the body other than a bodily orifice. Samples could not, generally, be taken without the consent of the sample provider: to do so would amount to an assault.

Secondly, the Act introduced the seriousness of the crime of which the person was suspected as a relevant factor. It created an exemption to the requirement for consent to take a non-intimate sample for the investigation of ‘serious crimes’ (at that time, crimes such as murder and rape). Thirdly, the Act required reasonable grounds for suspicion, and authorisation by a senior officer, for the taking of a sample without consent. Fourthly, the Act specified the grounds for retention of samples and of information derived from them: it originally required that samples and information derived from them be destroyed if no conviction resulted, with the effect that their retention was linked to the existence of a *criminal* record as such rather than an implicit record of suspicion.¹⁰

- 2.17 In the 1980s the use of forensic science in criminal proceedings was subject to significant and repeated criticism in a number of high-profile cases, such as those of the ‘Birmingham Six’ and the ‘Guildford Four’. It was in this context – in order to make the use of forensic science more robust – that in 1989 a House of Commons Home Affairs Select Committee, inquiring into the operation of the FSS, first recommended the creation of a DNA index.¹¹ The Government response to this report acknowledged publicly for the first time that work was in fact under way to create the necessary framework for a database. However, it drew attention to the fact that there were important legal and ethical questions to be addressed.¹² The first occurrence of the term ‘DNA database’ in the parliamentary record appears to come in an answer to a parliamentary question in November 1991, indicating that by that time “The question of establishing a DNA database [had] been put to the Royal Commission on Criminal Justice.”¹³
- 2.18 The Commission, which reported in 1993, recommended conditions for the establishment of a database:
- (i) the reclassification of buccal swabs (swabs of the inside of the mouth) as non-intimate;
 - (ii) the extension of the category of serious arrestable offences to include assault and burglary; and
 - (iii) that the obtaining of samples should be decoupled from their usefulness to a particular investigation (and therefore, implicitly, that they should be obtainable for the sake of future reference).¹⁴
- 2.19 The Criminal Justice and Public Order Act 1994 duly provided these powers, going further in relation to the ‘seriousness’ of an offence to allow swabs to be taken in the investigation of any ‘recordable’ (rather than ‘serious’) offence. Recordable offences are those that may be recorded on the PNC as convictions, including offences punishable by imprisonment and others such as drunkenness, begging or making nuisance calls. This set in place the necessary conditions for a national DNA database, expanding the use of DNA in the investigation of

crime from confirming or attenuating suspicion to producing suspects. Expansion of both purpose and population meant that more categories of crime, criminals and suspects came into the frame.

- 2.20 The NDNAD became a reality in 1995, consolidating samples from all police forces in England and Wales. Forces from the rest of the UK began submitting profiles from the following year, after the passage of the Criminal Procedure and Investigations Act 1996. The database was further expanded in 1997 through the Criminal Evidence (Amendment) Act 1997, which made provision to take samples from prisoners who had already been convicted and imprisoned for certain serious and sexual offences before the new sampling legislation came into force.¹⁵ It also extended the scope to people “detained following acquittal on grounds of insanity or finding of unfitness to plead.”¹⁶
- 2.21 Further expansions were provided for by the Criminal Justice and Police Act 2001, which extended powers to retain and speculatively search samples and profiles from those not convicted of an offence, and by the Criminal Justice Act 2003, which granted powers to take and retain samples and profiles from anyone arrested for a recordable offence. As a result of this last piece of legislation, suspicion (on reasonable grounds) by any police officer became a sufficient condition for permanent and involuntary retention of a DNA record on the NDNAD. More recently, during a review of the PACE 1984 legislation initiated in 2007 but not yet concluded,¹⁷ it has been proposed that DNA sampling may be extended to non-recordable offences.
- 2.22 As it has become progressively easier to be recorded on the NDNAD, it has become simultaneously harder to have records removed from it. Firstly, as Her Majesty’s Inspector of Constabulary found in a report published in 2000, even when it was a legal requirement for samples and profiles from those who were not proceeded against or convicted of an offence to be destroyed, perhaps as many as 50,000 profiles falling into this category may have continued to be held.¹⁸ Although this may have caused some embarrassment to the police and the FSS, and difficulties for a number of prosecutions,¹⁹ the solution – to amend the law in order to remove the offence – would have seemed more perverse if it were not that it primarily served the, by then, publicly stated purpose of expanding the database by retention of all lawfully obtained samples.
- 2.23 Secondly, while it has remained possible for an individual citizen to apply to the relevant Chief Constable, who remains the ‘owner’ of the sample profile, to have their record removed from the database, the criterion for removal has consistently been that the case exhibits ‘exceptional’ circumstances. These are nowhere defined, but the guidance given by the Association of Chief Police Officers (ACPO) gives a flavour of how exceptional they need to be. It indicates that a first application should be met with automatic refusal, and a second or persistent application considered only in exceptional cases, and

then referred to the DNA and fingerprint retention project.²⁰ The approach set out is that a ‘library of precedents’ will be established against which future applications can be compared. The example given in the guidance (people arrested for an offence that turns out, upon investigation, never to have taken place) is unusual and does not, in any case, relate to the grounds for suspicion falling upon one individual rather than another. From correspondence received by the Human Genetics Commission (HGC), we are aware of a number of cases in which applications have met with refusal, but very few in which they have met with success.²¹ This is now set to change with the judgment of the European Court of Human Rights in the case of *S and Marper v. The United Kingdom*. The Government is obliged to comply with this judgment under the Human Rights Act 1998 and has set out its initial proposals in a consultation document.²² We will discuss both these developments below.

- 2.24 A third difficulty in achieving removal from the database affects ‘volunteers’ who are required to give consent before their samples are taken. Although volunteers’ consent must be sought in order to authorise the taking of samples (where to do so without it would be unlawful), they are currently also asked to consent to the holding of their samples, and profiles derived from them, either for the purposes of a particular investigation (at the conclusion of which they will be destroyed) or generally and indefinitely. In this latter case, the profiles are (at present) made available for speculative searching. The volunteers are informed that, if they agree to their samples being retained generally, this consent cannot in future be withdrawn (or rather its withdrawal will not result in the samples or profiles being destroyed or removed). We will discuss this approach to consent, too, in the course of this report.

The object of DNA retention: a dilemma

- 2.25 PACE 1984 (as amended) currently provides that samples may be retained:

“after they have fulfilled the purposes for which they were taken but shall not be used by any person except for purposes related to the prevention or detection of crime, the investigation of an offence, the conduct of a prosecution or the identification of a deceased person or of the person from whom a body part came.”²³

- 2.26 As one of our consultation respondents observed:

“The current restriction that the bioinformation is to be used only for purposes related to the prevention or detection of crime, the investigation of an offence or the conduct of a prosecution is so broad that it can easily be interpreted to allow uses that have not much to do with criminal justice.”²⁴

- 2.27 Furthermore, while the legislation provides, in broad and vague terms, for how the NDNAD may be used, it neither identifies nor explains the reasons for its existence. The NPIA has stated repeatedly that the NDNAD is an “intelligence tool” that brings benefits by “identifying offenders and securing ... convictions”.²⁵ The primary purpose of the NDNAD therefore appears to be something like the following: to produce suspects for police investigations by matching DNA profiles obtained from crime scenes with DNA profiles held on the database.
- 2.28 This purpose will be fulfilled most effectively by meeting the objective of capturing the profiles of “virtually the entire criminally active population”.²⁶ It is obvious that this population is not the same as the class of people previously arrested in connection with, or convicted of, an offence. (Some people will become criminally active who have not been criminally active before; some will cease to be criminally active, retiring from criminal activity or becoming reformed; some of those who are criminally active are not convicted; some are wrongly convicted of criminal offences when, in fact, they have never been criminally active.) In relation to this objective, any actual database of profiles of arrestees will therefore contain the profiles of people who are not criminally active.
- 2.29 Because holding a database of personal (genetic) information constitutes a *prima facie* interference with individual privacy,²⁷ a justification for holding this data is required. There are two standard ways of providing this justification:
- (i) a justification based on facts or claims about each particular individual (such as that their known past behaviour makes them more likely to offend in future); and
 - (ii) a justification based on an individual’s membership of a class of people about which claims are made (such as that people who share certain relevant biographical or other similarities are likely to pose an increased threat to the rest of the population).
- 2.30 Employing the first kind of justification (justification *ad hominem*), retaining the profiles of convicted offenders is usually treated as unproblematic because their conviction is accepted as justifying a greater level of interference with their privacy rights. Where this approach runs into trouble, however, is with those who have not been convicted of an offence and who ought not to be treated as if they have a similarly diminished right to privacy. The criminal law places the burden of proof on the prosecution, requiring that someone is presumed ‘innocent until proven guilty’ of an offence of which they have been suspected or accused.²⁸ Furthermore, the standard of proof in criminal law is stringent, requiring guilt to be demonstrated ‘beyond reasonable doubt’. Setting aside those who have been convicted of an offence, an *ad hominem* justification for holding any other individual’s DNA profile must therefore meet at least two conditions: (1) there must be some verifiable fact about the individual other than offending behaviour that is the basis for this inference

(if we are to presume that the person is innocent of an offence), and (2) there must be a good basis (e.g. an adequate evidence base) on which to infer a risk of future offending reliably from this known fact. To treat an unconvicted person as having a diminished entitlement to privacy in the same way as a convicted person, i.e. to treat them 'as if' they were guilty of an offence despite their guilt not being proven at the outcome of a judicial process, would be to set aside the judicial process and the presumption of innocence in favour of a balance of probabilities or a simple, untried belief that the person had committed the offence but evaded conviction.

- 2.31 With regard to the second – categorical – kind of justification for holding personal genetic information, there is some criminological evidence that purports to show that some groups of people who have not been convicted nevertheless present a higher than average risk of committing criminal offences. It has been suggested that one candidate group comprises people arrested by the police, especially those charged and brought to trial (although not convicted). However, any individual included in this class of people assumed to present a higher risk of offending could challenge the ground for their inclusion and claim that they were being unfairly treated in comparison to others who were not included.
- 2.32 These two considerations – that the unconvicted ought not be treated as having a diminished entitlement to privacy in the same way as the convicted, and that to treat people who have certain similarities as if they were the same risks discriminating against them unfairly – suggest two different but, in theory, equally coherent approaches to the construction of a database:
- (a) to maintain a database comprising records that relate only to those with a diminished right to privacy – convicted offenders – and accept that the database will not fulfil the purpose of providing suspects for all or most crimes for which crime scene DNA evidence is available; and
 - (b) to extend the NDNAD to include the whole population on the ground that any offence will be committed by a member of that population. In this case, the purpose served by the database – of identifying suspects and thereby solving and, perhaps, preventing crimes – must constitute an adequate justification for interfering with the privacy rights of the whole population, which includes people who do not have a diminished entitlement to the enjoyment of those rights.
- 2.33 Which of these limit cases is more attractive is likely to depend upon how one values the likely impact of crime in comparison to the impact on privacy and civil liberties of a compulsory database. In the United Kingdom, because there has been no resolution at a societal level of these competing values of public protection from crime and the protection of personal privacy with regard to the NDNAD, an

equivocation has been allowed to persist about the basis for DNA profile retention in an attempt to appease concerns about both the threat of crime and the erosion of civil liberties.

- 2.34 Between, or alongside, the approaches described above lies a third approach:
- (c) to base a retention policy not on an individual's proven or suspected guilt, or on the general seriousness of the threat of crime, but rather on some robust estimation of the value of holding their data in preventing future crime or leading to the conviction of offenders.
- 2.35 This approach requires the acceptance that *some* interference with the privacy of *some* people who will not fall into the class of convicted offenders is necessary for public protection. The problem for this approach is, as we observed above, how to distinguish legitimately between those whose profiles should be recorded and those whose profiles should not.

S and Marper v. The United Kingdom

- 2.36 The issue has come to a head in the case of *S and Marper v. The United Kingdom*, in which the applicants were unconvicted individuals who wished to have their records removed from the NDNAD. The application relied on Articles 8 and 14 of the Council of Europe Convention for the Protection of Human Rights and Fundamental Freedoms²⁹ to require fingerprint records and DNA samples and profiles, obtained by police in the UK, to be destroyed. ('S', a juvenile at the time, was acquitted of the offence with which he was charged and Mr Marper was not proceeded against.) The domestic courts in England and Wales had previously found that, while there was some minimal interference with Article 8(1), the interference was justified under Article 8(2), and had rejected the applicants' submission that they had been treated in a discriminatory manner. According to the judgment handed down, the judges at the European Court of Human Rights in Strasbourg understood the parties to have dealt with the dilemma described above in the following ways:
- (i) The applicants ('S' and Mr Marper) argued that the retention by the state of their personal information (their submission claimed that cellular samples and DNA profiles were especially sensitive information) constituted an arbitrary interference with their privacy that was not justified or proportionate.³⁰ Furthermore, this placed them, unfairly, in a significantly different position from that of the majority of other people who had not been convicted of an offence. They argued, in effect, that only the first kind of database described above is legitimate.
 - (ii) The Government argued, in effect, for a population database, but one that was populated by the only lawful means available.³¹ In the absence of legislation that permitted universal compulsory

sampling, this meant the retention of lawfully obtained ‘criminal justice’ samples (those taken from arrestees) and samples given voluntarily. To have succeeded they would have had to establish that a database of this sort was necessary in order to meet the legitimate aim of preventing crime or harm to others. (It is interesting, since their argument tends to support a population database, that the Government introduced, alongside the justification for interfering with the applicants’ Article 8 rights, a number of additional, positive reasons for individuals to be on the NDNAD, including that inclusion would exculpate the innocent as much as it would inculcate the guilty. It might also allow the identification of body parts following natural disasters or terrorist attacks.)

- 2.37 In finding in favour of the applicants in relation to Article 8, the Strasbourg court criticised the “blanket and indiscriminate nature of the powers of retention of fingerprints, cellular samples and DNA profiles of persons suspected but not convicted of offences” as “failing to strike a fair balance between the competing public and private interests” and overstepping “any acceptable margin of appreciation in this regard”.³²
- 2.38 Some of the considerations raised in reaching this judgment are implicitly relevant to how the “blanket and indiscriminate” powers might be limited to make retention of suspects’ personal information more proportionate to the legitimate aim of the database. Potential limitations to these powers noted by the court include:
- (i) limiting the period of retention;
 - (ii) limiting the period of retention in relation to the age of the suspected person;
 - (iii) limiting the period of retention according to the nature or seriousness of the offence of which an individual was suspected;
 - (iv) providing a procedure for applications to have records removed from the database; and
 - (v) instituting an independent review of the justification for retaining samples, according to criteria including such factors as “the seriousness of the offence [of which the person was suspected], previous arrests, the strength of the suspicion against the person and any other special circumstances”.³³
- 2.39 Although these limitations are used in other Council of Europe Member States, those that relate to the seriousness of the offence, grounds for suspicion, previous arrests, etc. may, from one point of view, appear to threaten the presumption of innocence. The argument might be expressed something like this: suppose two people are arrested and brought to a police station to have a DNA sample taken; one is suspected of a serious crime (murder or rape, for example) the

other of a minor crime (say, taxi touting). Criminal proceedings run their course and both are found not guilty (or perhaps proceedings are dropped or they are never charged). In the eyes of the law, both are presumed to be innocent. Given that the offences happened, this entails that people other than the arrestees (perhaps as yet unidentified) are presumed to have committed the offences of which they were suspected. If this is the case, it cannot therefore make sense to keep the DNA profile of one suspect longer than that of the other – to keep the profile of someone who is not guilty of a murder longer than that of someone who is not guilty of taxi touting. This is because the person who is not guilty of taxi touting is *also* not guilty of the murder *in the same way and to the same extent* as the person suspected – but acquitted – of the murder. And because being not guilty is the reciprocal of being guilty and neither admit of degree, it can make no sense to keep the profile of the suspected murderer or taxi tout and not that of any other member of the population *who is equally not guilty*.

- 2.40 It is implicit in what we have said above that this difficulty may only be overcome by a subtle but significant change to the way in which retention is justified: from a fact or supposition about an individual (their ‘character’ or past behaviour, actual or suspected) that gives the state an entitlement to hold their DNA record, to an estimation (scientific and evidence-based) of the risk of that individual committing an offence in the future. This apparent move from entitlement-based to risk-based retention signals, significantly, the introduction of a more scientific approach into policing practice, moving investigation from the territory of belief (*ad hominem* suspicion) to scientific theory (prediction based on known facts). In this way, the NDNAD may, as the NPIA says, have ‘revolutionised’ policing, by foregrounding science, research, and the use of statistical evidence.
- 2.41 These considerations suggest the line of enquiry that might lead to an acceptable justification for a database of a certain sort. This enquiry has two parts, to deal with the following questions: firstly, can reliable evidence be produced that shows that a definable subset of people, who have not been convicted of committing a criminal offence by a court, present a significantly higher risk of doing so in future than the remainder of the unconvicted population? Secondly, does the recording of this subset on the NDNAD, and the use of this by police, diminish that risk, or in some way improve outcomes when the risk is realised? In other words, has the ‘revolution’ in policing practice represented by the NDNAD led to any discernible improvement in deterring, catching and convicting offenders?

The government response

- 2.42 For its part, the Scottish Government, in the policy memorandum accompanying the Criminal Justice and Licensing (Scotland) Bill, published in March 2009, has already indicated that it believes its

policy (of retaining, for a limited period, profiles from those charged with, but not convicted of, a violent or sexual offence) is compliant with *S and Marper*.³⁴

- 2.43 The UK Government, in setting out how it proposes to comply with the Strasbourg court's judgment, has also striven to claim a pragmatic 'middle ground'. The UK Government's initial response to the *S and Marper* judgment was set out by the then Home Secretary, Jacqui Smith, in a policy speech given on 16 December 2008, within two weeks of the judgment. This speech gave little quarter to those who might have taken encouragement from the Strasbourg court.³⁵ It emphasised that government policy will be characterised by "safeguards, openness, proportionality and common sense". It highlighted the response of victims' families to the Strasbourg judgment, and drew attention to individual cases in which DNA evidence has proved either useful or necessary to securing a conviction. The speech also emphasised the Government's commitment to the NDNAD as "crucial to public protection". In May 2009, the promised consultation on proposals to comply with the Strasbourg judgment was published by the Home Office. It was entitled, somewhat defensively, *Keeping the right people on the DNA Database: Science and public protection*. In the meantime, the Government had taken the step of introducing, at Committee stage in February 2009, an amendment to the Policing and Crime Bill as an interim measure to enable the legislative changes necessary to comply with the *S and Marper* judgment. The amendment provided for Regulations to be made to "make provision as to the retention, use, and destruction of material", including DNA and other samples taken from a person in connection with the investigation of an offence, and information derived from DNA samples so taken from a person.³⁶
- 2.44 The HGC has responded separately to the proposals contained in this consultation.³⁷ They include the disposal of all biological samples, the removal from the database of all records relating to volunteers, the disposal of records relating to children with only one minor offence when they reach 18, and the imposition of time limits for the retention of samples from those not convicted of an offence (six or 12 years depending on the seriousness of the offence of which they were suspected).

The importance of a clear purpose

- 2.45 We have described above how the NDNAD has developed from a database of convicted criminals to a database of potential suspects, and that it would tend to increase haphazardly by the inclusion of all arrestees if there were no other deliberate limitation set on the collection and retention of profiles. Whether or not the current absence of a clear stated purpose for the database indicates a pragmatic preference for leaving this question of purpose open, we believe there are several good reasons to close it:

- (i) Firstly, doing so will simultaneously help to clarify when people should be included on the database and when they should be removed. (Furthermore, notwithstanding the Government's current proposals regarding volunteers, in the case of any people whose records are included voluntarily after their consent it will be possible to determine, when the information is used, that their consent is effective.)
- (ii) Accepted data protection principles can be applied. We recognise that information in the criminal justice system is in some ways exceptional: it is not possible to balance the interests of data subjects with those of the data controller, because they are often, by definition, incompatible.³⁸ Nevertheless we believe that information collected should only be used for purposes defined at the time of collection (or agreed later as the result of a public process) and that information collected should not be excessive for those purposes. In general, people should also be able to expect that information will be accurate and up-to-date (so that they are not victims of mistaken identity), and to know for how long it may be kept, who may have access to it, and that it will be held securely.
- (iii) Where information from the database is shared or linked,³⁹ a clear definition of purpose will help to establish the terms of consistency and reciprocity.
- (iv) A definition of purpose will support evaluation of the utility of the database. Failure to define its purpose may lead to lack of accountability for, and wastage of, public resources. (We consider this issue in some detail in chapter four.)
- (v) A definition of purpose is essential to any evaluation of the acceptability of the database: we cannot determine whether the approach taken is a proper and proportionate one unless we know against what we are measuring its proportionality.
- (vi) The value of public confidence cannot be underestimated and the difficulty of achieving even obviously desirable objectives without it should not be forgotten. A theme in many responses to our consultation was a well-founded belief that the capabilities offered by new technological innovations would continue to expand, which, in turn, gave rise to a fear that this might lead to 'function creep' – the operationally driven use of the existing resource for new purposes not envisaged when the resource was established. This would be made possible by technological innovation and lack of inhibiting measures (e.g. public opposition or legislation).⁴⁰ Having a definition of purpose will both limit this, and create the need and the premises for any further debate about extending those purposes.

2.46 In addition to these practical justifications, there are legal and procedural reasons that also persuade us that the scope of use of the

NDNAD should be precisely defined. In the first place, the current legislative vehicle for the provisions that control the use of the database is the Police and Criminal Evidence Act 1984 (as amended). This Act, as the title indicates, is “An Act to make further provision in relation to the powers and duties of the police, persons in police detention, criminal evidence, police discipline and complaints against the police; to provide for arrangements for obtaining the views of the community on policing and for a rank of deputy chief constable; to amend the law relating to the Police Federations and Police Forces and Police Cadets in Scotland; and for connected purposes”.⁴¹ It is not obviously an appropriate vehicle to provide for a database that is not concerned with police procedure, nor only about criminal evidence in relation to a particular crime, but that goes far beyond this. (It bears reflection that, in its original form, the Act required the destruction of biological samples after their use in a specific investigation, i.e. where they constituted criminal evidence. DNA samples and profiles retained outside and beyond the scope of an investigation cannot be regarded as evidence in the same way, as their purpose is not specific to an investigation but for another purpose – a database to compare to evidence from crime scenes). Furthermore, it is worth recalling that at the time when the Act was the subject of a full debate in Parliament and of parliamentary scrutiny during its report stage, the state-of-the-art technology with respect to biological sampling was blood typing rather than DNA analysis. The Act’s central purpose (although amended via subsequent regulations) was not to control DNA samples, nor to address the kinds of specific issues that they raise.

- 2.47 For all these, reasons **we recommend that the National DNA Database should be established in law through new primary legislation. The permitted uses of the records constituting the National DNA Database should be simply, unambiguously and explicitly defined in legislation, and any use of the database that falls outside those permitted uses should be made an offence subject to strict penalties. Any provision made for amending those uses through delegated legislation should be limited in scope in the primary legislation.** The purpose of establishing and maintaining a National DNA Database should be evident in the introduction to such new legislation; its uses must be constrained by law to the achievement of those purposes.

Notes to chapter two

1. Indeed, a more permissive law was introduced in 2001, in part because DNA samples and profiles were unlawfully retained when they should have discarded.
2. The relevant judgment is *S and Marper v. The United Kingdom* (Applications 30562/04 and 30566/04), judgment of 4 December 2008 (unrep.), ECtHR (Grand Chamber). The Government’s response to the judgement is contained in the Home Office consultation *Keeping the right people on the DNA Database: Science and public protection*: Home Office (2009).
3. For crimes committed in Scotland, a search is made of the Scottish DNA Database. If no match is found, the profile is exported to the NDNAD to search for a match there. Subject profiles (profiles from known individuals) originating in Scotland are weeded from the NDNAD where no conviction results, since they may not be retained under Scottish Law. A report containing about 2,000 such profiles for weeding is sent from the Scottish DNA Database to the NDNAD each month.

4. This proposal is contained in the Home Office consultation following the European Court judgment published in May 2009: see Home Office (2009).
5. This work used to be conducted by the FSS from within government. The FSS became a government-owned company (FSS Ltd) in 2005 and the provision of forensic genetics was opened up to commercial competition. There are currently three companies who provide genetic profiles to the NDNAD and the Scottish DNA Database and the Northern Ireland DNA Database: the Forensic Science Service, LGC Forensics and Orchid Cellmark.
6. National DNA Database Strategy Board (2007), p.42.
7. Such matching may carry some uncertainty, particularly when a sample is degraded in some way.
8. www.npia.police.uk/en/8934.htm
9. The categorisation of 'intimacy' here seems to have less to do with the nature of the sample itself than the intrusiveness of the procedure required to obtain it involuntarily. The development of DNA testing appears to alter this conception of intimacy from the way in which it is implied in the body to the nature of the information that can be derived from the sample. Thus the Human Tissue Act 2004 creates an offence of having or taking a biological sample with the intention to analyse the DNA it contains without the consent of the sample provider, even if that sample was left lying around and obtaining it did not require their complicity or even their knowledge. See our discussion of the 'intimacy' of DNA in chapter three.
10. It is interesting to note that in *R. v. D*, a case in which DNA evidence which should have been destroyed in compliance with this provision was unlawfully kept and subsequently relied upon in the prosecution of a murder (quoted in the House of Lords appeal judgment in *S and Marper*) the judges observed that a case could have been made for retention, but was not done so at the time.
11. House of Commons Home Affairs Select Committee (1989).
12. HM Government (1989), p.8.
13. HC *Hansard*, 29 November 1991, vol. 199 col. 654W.
14. Royal Commission on Criminal Justice (1993).
15. Criminal Evidence (Amendment) Act 1997, s.1. The offences are defined in Schedule 1 to the Act.
16. PACE 1984, s.63(3C) (as amended).
17. The conclusions of this review are not available at the time of writing although a summary of responses to the Home Office's consultation exercise is. The HGC's response is available on the HGC website (www.hgc.gov.uk). In view of the *S and Marper* judgment the Home Office has indicated since the beginning of this review that issues relating to the NDNAD would be dealt with separately.
18. Her Majesty's Inspector of Constabulary (2000), para.2.23.
19. See, for example, *R. v. D (Att.-Gen.'s ref. No. 3/1999)* [2001] 2 AC 91, where the unlawful use of DNA in prosecution is considered.
20. ACPO (2006), p.12: "In the first instance applicants should be sent a letter informing them that the samples and the associated PNC record are lawfully held and that their request for deletion/destruction is refused."
21. The campaigner Mark Thomas published the account of his successful application for removal of his record from the NDNAD in the *Guardian* newspaper (19 March 2009). Since then, the MP Diane Abbott has held DNA clinics with lawyers from Liberty to help those not convicted of an offence to have their records removed from the NDNAD.
22. Home Office (2009).
23. s.64 (as amended). This immediately creates an exception that takes database records outside the ambit of one of the core principles for protecting the interests of people with respect to information held about them by others, namely the second data protection principle (the principle of purpose limitation), which states that "Personal data shall be obtained only for one or more specified and lawful purposes, and shall not be further processed in any manner incompatible with that purpose or those purposes." Data Protection Act 1998, Sched.1, Part I, para.2.
24. Consultation response 10 (individual).
25. For example, in written memoranda of evidence to the House of Lords Constitution Committee inquiry on surveillance (House of Lords Select Committee on the Constitution (2009)); House of Commons Home Affairs Select Committee inquiry on surveillance (House of Commons Home Affairs Select Committee (2008)); and www.npia.police.uk/en/8934.htm
26. This was the objective described by the then Prime Minister, Tony Blair, in a speech in 2000 that signalled the start of the 'DNA database expansion programme'. The programme, with funding of £182 million, produced an increase in subject profiles from under one million in 2000 to over three million by 2004.
27. European Court of Human Rights, *S and Marper* judgment, para.77: "...the Court concludes that the retention of both cellular samples and DNA profiles discloses an interference with the applicants' right to respect for their private lives, within the meaning of Article 8 § 1 of the Convention."

28. This has been famously referred to as the “golden thread” running through English justice: *Woolmington v DPP* [1935] AC 462, *per* Lord Sankey L.C. at p.7. This presumption refers not to factual guilt but to legal guilt: not whether a person actually committed an offence but whether their guilt can be proven beyond reasonable doubt in court.
29. Article 8(1) guarantees the right to respect for a citizen’s private and family life, his home and his correspondence, although by Article 8(2) a public authority may interfere with this right in accordance with the law and when it is necessary, *inter alia*, in the interests of national security or public safety, for the prevention of disorder or crime, or for the protection of the rights and freedoms of others. Article 14 guarantees the enjoyment of all rights conferred by the Convention without discrimination.
30. The right to respect for private and family life is guaranteed by Article 8(1) of the Council of Europe Convention for the Protection of Human Rights and Fundamental Freedoms. Article 8(2) qualifies this right in certain circumstances.
31. “The records were retained because the police had already been lawfully in possession of them, and their retention would assist in the future prevention and detection of crime in general by increasing the size of the database.” (Judgment, para.94. See also para.123.)
32. Judgment, para.125.
33. See especially judgment, para.119.
34. Criminal Justice and Licensing (Scotland) Bill, Policy Memorandum, para.297: “The recent judgment from the European Court of Human Rights ... in the case of *S and Marper v UK* ... highlighted that the present arrangements in Scotland contained in section 18A of the 1995 Act strike a balance between the public protection benefits of retaining DNA for future criminal investigations and the rights of those who have had DNA taken under suspicion of having committed an offence, but are not ultimately convicted.”
35. “Protecting Rights, Protecting Society”, speech to the Intellect Trade Association, 16 December 2008.
36. Policing and Crime Bill, cl.95 (amending PACE 1984, s.64B).
37. The response can be found on the HGC website.
38. There will inevitably be operational reasons for setting the principles aside in some cases. Subject access provisions might tip off terrorist subjects to surveillance operations, for example.
39. We believe that this should only be done under condition that the data is non-identifying and decoupled from any information that could link it to an identifiable individual.
40. In chapter four we will look at function shifts in the context of the real, complex system of dispositions and motivations, where the context in which they occur is also simultaneously and continuously altering.
41. PACE 1984 (long title).

Chapter three

DNA, privacy and discrimination

“DNA is, by its very nature, incredibly intimate.”

— Liberty (The National Council for Civil Liberties)

“If you haven’t or don’t intend to commit crime then why are you bothered about your DNA being stored?”

— Visitor to the *Inside DNA* exhibition

Introduction

- 3.1 In our first report, *Inside Information*,¹ we identified features of genetic information that make it especially sensitive in certain circumstances. We were careful, however, to draw attention to the fact that not all genetic information is sensitive in all circumstances and that some information about a person's genome (such as information that can be inferred reliably from publicly observable characteristics) may not be especially sensitive in practically any circumstances.
- 3.2 Although genetic information may not be, in itself, more important or more sensitive than other information contained in police records, it can certainly be important in different ways: the fact that *genetic* information is on *police* records is a novel conjunction, giving novel possibilities that must be treated as such. From the perspective of the history of police records it is possible to see the National DNA Database (NDNAD) simply as another development – a more powerful resource, arguably, but not operationally different from, say, IDENT1 fingerprint records – rather than a radical innovation constituting a discontinuity in this history. We have conjectured that this might explain some of the apparent difficulty experienced by those in the criminal justice system who found themselves responsible for its oversight, as other stakeholder groups with 'genetics' value sets (i.e. who value genetic information in a particular way) become engaged and bring these values to bear.
- 3.3 In this chapter we will try to identify and examine the premises on which arguments about the NDNAD's capacity to interfere with civil liberties are built. We will then explore the two major grounds for complaint: (1) that the retention of DNA profiles on the NDNAD constitutes an intrusion into personal privacy; and (2) that it produces unfair discrimination.

The privacy of DNA information

- 3.4 The human genome is what both links us to and distinguishes us from all other human beings. This is asserted as a fundamental premise in a number of important international legal instruments.² The intuition that genetic information is different from other kinds of information in important ways was expressed by a number of respondents to our consultation. Some argued that holding genetic information is fundamentally different from holding other sorts of information, while others argued that specific consequences could follow from holding genetic information in a criminal justice context. One individual wrote:

“To add to this [general increase in state surveillance] an expansion of the DNA database which captures an individual's very 'genetic soul' is too great a violation of a person's being. An individual's DNA data is not the same as many other more mundane pieces of information we are obliged to divulge on a regular basis. DNA data is the very essence of that individual.”³

- 3.5 The law reform organisation JUSTICE called the information contained in a sample of DNA “the most intimate medical data an individual may possess.”⁴ Liberty (the National Council for Civil Liberties) repeatedly referred to the essential “intimacy” of DNA information. What is meant by ‘intimacy’ in this context? We consider below four properties of DNA that could be thought to make it particularly ‘intimate’.
- 3.6 Firstly, we might say that the link between an individual and their genome is necessary rather than contingent. Many other features that might identify someone, such as their name and address, their appearance or the clothes they wear, depend on other factors and choices; and we could easily imagine that person without those features, or with different ones, while still holding that they are the same person. However, we must be careful not to invest too much in the necessity of this link between a person and their genome. Perhaps we should not claim, for example, that an individual could not be the person they are and yet have different DNA from the DNA that they have. Cinema has already presented us, in the James Bond film *Die Another Day*, with a fictional template for a gene therapy procedure by which an individual’s genome may be systematically and radically altered. In the story Zao, who undergoes the procedure with the intention of disguising his identity, is revealed to be the same person – the same arch-enemy – after the procedure as he was beforehand. Conversely, we cannot claim that a particular DNA complement is necessarily linked to the identity of a unique person: the relatively common (about one in 250 births) phenomenon of identical twins adequately disproves this assertion. What we can claim is that there is a constant and indissociable link between a person and their genome: they cannot put it aside like a suit of clothes and, even if it could be altered, as in the film plot above, there would be a continuous association between the person and their DNA in its original or altered form before and after the procedure.
- 3.7 Secondly, a person’s genome is non-obvious – the particular sequence of chemical bases that make up the DNA sequence in each of a person’s 23 pairs of chromosomes requires a deliberate technical procedure to make it explicit. Such a procedure must be carried out on biological material that originates in the person’s body. For it to be carried out lawfully, the consent of the person whose body produced the material is usually required.⁵ This consent is required not because obtaining the sample necessarily involves a physically intrusive or invasive procedure: people shed bodily material containing sufficient DNA for laboratory analysis constantly, when going about their ordinary, everyday activities. Rather, consent is required because some information that might be obtained is considered private and deserving of protection. In fact, it is required partly because biological samples that yield sufficient DNA to analyse are so easy to come by that the danger of genetic information being obtained without the provider’s knowledge needs to be safeguarded against by law. Although the actual sequence of bases that make up an individual’s genome is non-obvious, some genomic information,

much of it admittedly trivial, can be inferred from publicly observable physical features. Such information may for example include the genes that code for red hair, or that underlie certain medically recognised conditions.⁶ Information about genes that predispose people to future disease, however, can be more sensitive. As the Economic and Social Research Council (ESRC) Genomics Network stated in its response to our consultation, the collection and storage of any personal data is a “highly sensitive issue ... [but] This sensitivity is even greater in the case of DNA and the information derived from it than is the case for other sources of information.” It cited two reasons: “A DNA sample may yield information of profound personal significance to the individual” and this information (such as biological relatedness or predisposition to disease) may be “unknown to the individual concerned”.⁷

- 3.8 Thirdly, DNA information is sensitive because it is ‘genetic’, in other words, because it is not only constantly associated with a particular identity but is in some complex way ‘identity-producing’. It has this property in two ways. The first is that some genes are associated with phenotypic features of an individual (their physical characteristics). An individual may identify themselves with, or be identified by others with, these physical features, as part of their identity as an essentially embodied being. Furthermore, it is through their embodiment that each particular individual experiences the world as an experience unique to them, so the genes that condition the particularities of our embodiment may also be said to condition, through those particularities, our experience of the world. As social science research shows, when DNA information is made explicit, social identity may be constructed in more subtle ways that link to the genome, rather than to an observable external trait. For example, interviews carried out with a number of offenders in Austrian prisons show that they perceive that DNA technologies have the effect of “inscribing the stigma of delinquency within the body”.⁸ The second – and more controversial – way in which we might say that genes can be ‘identity-producing’ relies on a less well established, although increasingly researched, body of theory that implicates genes in *conditioning* behaviour and capacities for different types of human performance, including cognition, although without in any way *determining* them.⁹
- 3.9 Fourthly, genetic information can be ‘identity-revealing’ (in the sense that it can identify, for example, both familial relations and predisposition to disease) as well as simply ‘identity-confirming’. It is this property that makes it substantially different from other ways of identifying people from the point of view of privacy. Because genes are inherited in relatively stable and determinate ways, genetic information from two distinct individuals can reveal relatedness, and degrees of relatedness, between them. This is different from, for example, fingerprints which simply confirm or refute a proposition that two occurrences of the fingerprint are identical. Revealing hitherto unsuspected personal biological relationships or ethnic origins can have profound and destabilising consequences for the individuals involved.

- 3.10 It is important for us to observe at this point that none of these considerations, with the possible exception of the property of revealing relatedness, applies to DNA profiles as currently recorded on the NDNAD. These are derived from the analysis of ‘non-coding’ sections of DNA that are not currently known to condition any phenotypic features. We will assess the arguments for and against retaining biological samples after profiles have been extracted later in this report; but for now we observe that retaining only profiles, and disposing of the biological samples from which they were extracted, accommodates many of the concerns individuals have about the police retaining ‘their DNA’. The ability of DNA profiles to reveal relationships is undoubtedly significant, however, and to the considerations we have already mentioned we should add a further one: that people assert, because in some ineffable way they feel this to be the case, that genetic information is a private matter. Regardless of the grounds, such a common assertion argues for caution: it may be that many people need time to come to terms with the advances and innovations that genetics science has made possible, and to develop an appropriate framework of concepts within which to articulate these feelings and bring them into play. In order to allow consideration of the privacy impacts of the NDNAD to inform the determination of its scope and use **we recommend that the legislation that establishes the National DNA Database should be accompanied by a full privacy impact assessment with advice from the Information Commissioner, so that these impacts can be considered when the legislation is debated openly in Parliament.**

Individual harms

- 3.11 Given the perceived ‘intimacy’ and sensitivity of DNA information, the possession of that information, and its use by a third party for their own purposes are likely to raise significant issues of privacy. Indeed, it is common ground in cases decided in the domestic courts and, most recently, in the European Court of Human Rights that merely holding genetic information on a forensic DNA database engages the right to private and family life enshrined in Article 8 of the European Convention on Human Rights (ECHR).¹⁰ Whether this right is violated, either in a particular case or institutionally (i.e. by the very existence of a certain sort of database) will depend on a judgment about proportionality. In other words, the right to privacy is not an absolute but a qualified right, meaning that there may be some good reasons why it might justifiably be set aside. Reasons why the right to privacy might be set aside will include the fact that it is done with the consent of the person concerned and, in the words of the ECHR, the fact that to do so is “necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others”.¹¹ This may mean, for example, that where there is good reason to believe that someone will commit crimes in future, their DNA profile might justifiably be recorded and retained.

- 3.12 While having a DNA profile recorded on the NDNAD might amount to an infringement of privacy, this would be less troubling if it were without any practical consequences. However, there are several arguments to consider to the effect that having one's DNA profile recorded on the database is not without possible consequences, and that these consequences may be both harmful and unjust.

'Nothing to hide, nothing to fear'

- 3.13 An aspect of the loss of anonymity that arises from the retention of a person's DNA profile on the NDNAD is that of being caught in an 'intentional' relationship – that is, being thought of in a certain way, being identified, irrespective of any other fact or feature, *as* someone whose data is on the NDNAD. Furthermore, because it is between the citizen and the state, this intentional relationship has the character of an 'official' relationship, invested with special significance (beyond ordinary, neighbourly suspicion) and given a history and permanence by being recorded in an official register.
- 3.14 In *S and Marper v. The United Kingdom*, the applicants complain of the social stigma of being included on the database.¹² In response to our consultation we also received a number of submissions about what being in such a relationship might mean and what potential consequences might follow. Dr Ruth McNally, an academic based at the ESRC Centre for Economic and Social Aspects of Genomics (Cesagen) who has written about the NDNAD, articulated this as an argument that the database creates a distinct category of 'pre-suspects':

“People whose profiles are on the database are the ‘pre-suspects’ ... – the first to be suspected (and eliminated) whenever a new crime scene profile is entered onto the database. In this respect they occupy a different space within the criminal justice system from the rest of the population; they are under greater surveillance and, with the advent of familial searching, this differential status can be extended to their relatives too.”¹³

- 3.15 The suspicion that there is often 'no smoke without fire' may be pervasive and hard to overcome – the danger of such suspicion was certainly a very real fear expressed by many respondents to our consultation. The Nuffield Council on Bioethics formulated this fear elegantly as a concern that the database will have the effect of “shifting the relationship between the individual and the state insofar as it treats all individuals as potential offenders rather than as citizens of good will and benign intent”.¹⁴
- 3.16 The Home Office's consistent response to these fears has been to argue that they are unfounded and that those who have nothing to hide have nothing to fear from inclusion on the database. This is entirely consistent with the approach that the Strasbourg court represents the UK Government as taking in *S and Marper*. In essence, this approach is that there is sufficient reason – given the threat of

serious crime and terrorism – to compile a database of subjects from all lawfully obtained samples, allied with the belief that increasing the size of the database is both more likely to produce valid matches leading to the conviction of genuine offenders and more likely to diminish the stigma of inclusion. Indeed, this view is shared to some extent by Dr McNally, who wrote in her consultation response that reducing the size of the database to a “hard-core set” of convicted criminals could mean that “those remaining on it may suffer from popular neglect, indifference or disinterestedness.”¹⁵ The Government’s assertions that the disadvantages of inclusion affect only the guilty are increasingly bolstered by the more recent introduction into the discourse about the database of positive reasons for inclusion. These include the fact that the database can rule people out of a police investigation as much as rule them in; and that it can be used to identify body parts and human remains, and possibly also to assist in tracing missing persons. These last uses, while potentially beneficial, represent significant departures from the reasons for obtaining samples initially, a point which should not go unnoticed.

Adventitious matches

- 3.17 There are a number of more practical harms that might conceivably result from being recorded on the database. People with DNA records might, for example, suffer additional intrusion into their personal lives as a result of ‘false positive’ search results (known as ‘adventitious matches’). However, the reverse might also be possible – we have heard of people who live in areas of especially high crime incidence who are pleased to have their profiles recorded on the database so that they can be eliminated from enquiries and thereby avoid repeated intrusions from the police investigating each new crime committed in the vicinity.
- 3.18 The complete standard SGM Plus profiles currently used (see paragraph 1.14) are generally understood to produce a match probability (that is, the chance of a crime scene profile matching an individual, if the DNA did not originate from that individual) in the region of one in a billion. The figure ‘one in a billion’ is an arbitrary value, and when actually calculated, the match probability of the majority of complete SGM Plus profiles is much lower and more often in the region of one in a trillion (a trillion being a thousand billion and a billion being a thousand million). When the SGM Plus profiling system was first introduced, there was agreement within the scientific community that identifications with match probabilities lower than one in a billion would not be quoted in the courts of law, so as to avoid overstating the value of the DNA evidence to take into account that match probabilities are only estimates, and to make sure that the figure used was one that was meaningful to non-specialists. Forensic scientists who interpret DNA evidence are not required to calculate the match probability of every complete SGM Plus profile they encounter, as it is understood that the most commonly occurring SGM Plus profile has a match probability rarer than one in a billion.

- 3.19 If the majority of complete SGM Plus profiles have a match probability much rarer than one in a billion then it would appear to be extremely unlikely that an adventitious match would arise as a result of a complete SGM Plus profile from a crime scene on the database. However, the situation may be different when considering the large number of incomplete SGM Plus profiles from crime scenes that are currently on the databases. (Incomplete profiles can occur for several reasons: if only limited amounts of DNA are present, or recovered, from a crime scene sample, or if the DNA is degraded or of poor quality, the result will be an incomplete profile.) In these situations, only some of the regions of DNA in the STR profile are amplified during the PCR. As certain loci amplify preferentially over others when the DNA template is limited, it is relatively easy to recognise an incomplete profile. Partial profiles may also be loaded onto the database when an incomplete profile is obtained from a mixture of DNA that could only be partially interpreted or when certain regions in a profile fail to pass the required quality checks and are therefore left undesignated (in which case the remainder of the profile is loaded to the database).
- 3.20 In order to be loaded onto the database, a partial profile must meet two additional criteria. First, there must be a complete result at four of the six loci that are common between SGM (the previous standard) and SGM Plus profiles. Second, the profile must have a match probability of no more than one in a million. Having profiles on the database with a match probability of as much as one in a million makes the chance of adventitious matches far more likely; however, it is impossible to calculate how great this risk might be without knowing how many partial profiles there are on the database with these comparatively high match probabilities.
- 3.21 Mixed profiles increase the chance of adventitious matches, as their interpretation often results in a partial profile being loaded onto the database. A mixed profile arises when DNA from more than one person is present in a sample recovered from a crime scene. While profiles which indicate the presence of DNA from many individuals are impossible to interpret, if it appears that the profile consists of DNA from only two or three people it can be possible to interpret the profile and tease out one, or occasionally two, profiles that meet the criteria that allow them to be loaded onto the database.
- 3.22 Although therefore still very unlikely, an adventitious match could occur. If it did, it would bring someone innocent into the scope of an investigation and might mean that they were required to account for the apparent presence of their DNA at a crime scene to police and possibly also to family, friends, neighbours and colleagues. Being the subject of a police investigation, even when one is wholly innocent, can be stressful, especially if the person concerned is vulnerable for some other reason. It can also have the knock-on consequence of drawing other members of that person's family into the investigation, which itself produces significant stresses and can have an impact on family relationships.

Risk of security breach

3.23 Another possible source of practical harm raised in the Citizens' Inquiry and by a number of respondents to our consultation was a failure in data security. The Royal College of General Practitioners drew attention to this and to the theoretical possibility of compounding this risk by linking NDNAD records with patient records. "The NHS IT Programme", it said, "highlights the nature of the difficulties that could arise and it is important that this is fully operational as a priority before any linking with DNA information is actively considered."¹⁶ It should be noted that no linking of forensic and other databases has been proposed, although it is acknowledged that the police may, pursuant to an order from a court, obtain access to health records – perhaps containing genetic information – in exceptional circumstances. However, the sharing of data with other jurisdictions (currently carried out under terms established by the Prüm Convention) and the potential linking of databases with other jurisdictions also provoked considerable concern.

Social harms

3.24 Even if it is allowed that there may be good reasons to keep the DNA profiles of individual citizens on a database for the purposes of crime prevention, detection or investigation, the retention of their records is unlikely to be acceptable if it is shown to be arbitrary or discriminatory (whether proceeding from discriminatory motives or resulting in discriminatory effects). In particular, many of the submissions we received drew attention to the disproportionate inclusion on the NDNAD of people from certain ethnic backgrounds and people from vulnerable groups. People with mental health conditions are considered much more likely to be arrested by the police and have their DNA taken. Children and young people are also thought more likely than older people to come to the attention of the police. The taking of DNA from children is of special concern because their future behaviour may be sensitive to factors such as the retention of their DNA profile from an early time in their lives. The ESRC Genomics Network, for example, drew special attention to the sensitivities concerning retention of information about young people. It noted that low-level offending behaviour is relatively common in young people but rarely carries on into adulthood: "In most cases, indefinite or prolonged retention of DNA profiles obtained from young people is ... unlikely to have much forensic utility in future."¹⁷ It therefore argued for a presumption that children's profiles should be removed except where, according to a framework to be developed by relevant agencies, there is a reason to set this presumption aside.

3.25 In their response to our consultation, GeneWatch UK, an organisation that has been consistently critical of the Government's presentation of data relating to the database, claimed that the Government underestimates the number of unconvicted children with profiles held indefinitely on the NDNAD. They noted that the UN Committee on the Rights of the Child has recommended¹⁸ that

the UK ensures, both in legislation and in practice, that children are protected against unlawful and arbitrary interference with their privacy, and expressed concern about retention on NDNAD regardless of conviction. In a policy speech shortly after the *S and Marper* judgment, the then Home Secretary, Jacqui Smith, announced that “immediate steps” would be taken to remove “the DNA of children under 10 – the age of criminal responsibility” which was estimated to involve “around 70 such cases”.¹⁹ This has now been accomplished,²⁰ but the fate of the records relating to the remainder of the children and young people on the database, officially estimated at more than 39,000,²¹ remains unresolved.

- 3.26 Responding to our consultation, the campaigning organisation NO2ID expressed a view typical of many respondents when they suggested that children’s profiles should be retained only on conviction for a serious crime and destroyed when the child reaches the age of majority, so respecting their capacity for rehabilitation.²² This is broadly the approach taken in Scotland. The approach proposed by the Home Office in its consultation *Keeping the right people on the DNA Database* falls somewhat short of this, however.²³ Although special considerations applying to children’s records are welcome, they may not be sufficient to ensure that their interests are properly respected. Some felt that other issues need to be resolved before consideration can be given to children as a special case: “At present children’s profiles are retained on the NDNAD on the same basis as adults and the issues are the same i.e. the basis under which they are obtained in the first place and how long they are retained. We doubt that making separate arrangements for the retention of children’s DNA profiles will, of themselves, resolve these issues.”²⁴
- 3.27 One of the principal objections to the retention of DNA profiles in the absence of a criminal conviction is the fact that they are obtained as a result of a decision by a police officer, rather than as the result of a process in which the individual is entitled to have any objections properly considered. In order to arrest a person without a warrant (i.e. on suspicion) a police officer must have “reasonable grounds”²⁵ both for that suspicion and for believing that the arrest is necessary. Comprehensive guidance on the exercise of the power to arrest without a warrant is given in the Police and Criminal Evidence Act 1984 (PACE) Code G,²⁶ which says that the nature of the offence leading to the arrest and the reasons for the arrest being necessary must, *inter alia*, be recorded by the arresting officer. While these safeguards are welcome, the fact remains that it is the decision of a police officer that leads to a person’s DNA being obtained and, whatever consequences may follow the arrest (no further action, charge, caution, conviction, acquittal, etc.), retention of the DNA record continues regardless, without any routine review. It is true that when a person has been arrested a discretion exists as to whether to take a sample, and then whether to submit that sample for profiling and loading to the database; however, we have heard from those working within the police service that this discretion is not exercised, inasmuch as to do so would require a justification to be given that

could potentially be seen as discriminating between different people who have been arrested. So the decision to arrest – one which may be taken, albeit reasonably, in the light of limited information and, almost by definition, in the context of a stressful situation – remains, in effect, the sole and determining moment for the inclusion of a person's profile on the NDNAD. In the light of these considerations **we recommend that new guidance is given on when it is appropriate to take a DNA sample following arrest and to record a resulting DNA profile on the National DNA Database; the guidance should have regard to the circumstances of the arrest (including the nature of the offence of which the arrestee is suspected). Furthermore, we recommend that an independent panel reviews, at regular intervals, evidence relating to arrests and the taking of DNA samples, in order to ensure that (1) the guidance is sufficiently robust and (2) the guidance is being appropriately followed.**

- 3.28 While it may not have been the intention, the consequence of retaining DNA profiles from all those arrested for a recordable offence by the police since 2003 has been a disproportionate representation of certain sub-groups (such as young black males) compared to other groups or the general population. A recent report for the Equalities and Human Rights Commission (EHRC) notes:

“Surprisingly there does not appear to be an official figure for the breakdown of ethnic minorities on the database. By our own calculations, using a range of official statistics, in excess of 30% of all black males are on the NDNAD, compared with about 10% of white males, and 10% of Asian males. Estimates suggest that black men are about four times more likely than white men to have their DNA profiles stored on the police NDNAD.”²⁷

- 3.29 Most commentators agree that, although the precise figures are somewhat unreliable owing to the categorisation of the individual arrested relying on the perception of the arresting officer, the extreme preponderance of young black males on the database is undeniable. This has been taken up by many commentators as an objection to the way in which the database is populated:

“NO2ID would argue that the disproportionate representation of young black men and other ethnic groups on the NDNAD is at least partly an artefact of police procedures (especially DNA retention on arrest) and the urban situation (who is most likely to come in contact with the police?) rather than institutionalised discrimination by the police. Though this does not excuse the disparity.”²⁸

- 3.30 This overrepresentation of particular groups, along with its further consequences, was one of the major negative social impacts of the database identified by respondents to our consultation: some (Liberty, for example) suggested that the “wide impact,

soft touch” implications of a “creeping database” had not received sufficient attention as a result of the focus of media debate on individual cases.²⁹

Stigmatisation

3.31 Of the harms arising from disproportionate inclusion of groups on the database, the one that generates most concern is stigmatisation: if the taint of suspicion lingers in relation to individuals in virtue of the retention of their profiles on the database, it spreads like a stain across overrepresented groups. This is expressed forcefully in the EHRC report referred to above:

“...we are concerned that the high proportion of black men recorded on the database (estimated to be at least one in three black men) is creating an impression that a single race group represents an ‘alien wedge’ of criminality.”³⁰

3.32 One solution that has been suggested to address stigmatisation is deliberately to obscure it – in other words, to take a positive decision not to categorise people arrested. By that means, no one would know the relative proportions of different groups on the NDNAD, and therefore no one would be able to argue that one group was inherently ‘more criminal’ than another. Our Citizens’ Inquiry considered this proposal seriously, and the majority recommendation was that “a person’s ethnicity should not be recorded” as this could lead to further discrimination. Many felt that defining the ethnicity of a person arrested on the basis of the perception of the arresting officer was unreliable and itself potentially discriminatory. A minority disagreed with this conclusion, however, and argued that ethnicity should be recorded in order to permit the patterns of arrest to be monitored.³¹ Such an approach would be consistent with the duty to take positive steps to reduce inequalities that would be placed on public authorities as a consequence of the Equality Bill that is likely soon to become law. We note, however, that ethnicity is in any case recorded on the Police National Computer, which would continue to be linked to the NDNAD record.

3.33 For its part, the EHRC report recommends that the National Policing Improvement Agency (NPIA) acts urgently to carry out a race equality impact assessment (EIA), as recommended in the Home Affairs Select Committee report *Young Black People and the Criminal Justice System*,³² so that it can provide information about ethnic minority representation on the database, although the EHRC has “a number of concerns” about EIAs carried out to date. (Since this response was received, the NPIA has published a Stage Two EIA of the NDNAD.³³) Although recognising that the NDNAD is “an important crime solving tool which the Commission does not seek in principle to abolish”, the EHRC speculates about three “potential threats” posed by the overrepresentation of black men on the database: (1) race patterns on the database could strengthen the tendency for ethnic profiling, stereotyping black men as suspects for particular types of offence;

(2) the stigma of extreme overrepresentation has “unknown but possibly serious” social consequences, requiring a sufficiently serious justification for recording DNA profiles to balance these consequences; and (3) samples/profiles could be sold to commercial companies carrying out research to link “criminogenic genes” with race.³²

- 3.34 We are also concerned about the possible disproportionate impact of the NDNAD on some groups within society and **we recommend that the legislation that establishes the National DNA Database should be accompanied by a full equality impact assessment so that these impacts can be considered when the legislation is debated openly in Parliament.**

Disproportionate outcomes

- 3.35 A consequence of the disproportionate representation of certain groups on the NDNAD may be the disproportionate level of arrests, charges and convictions of members of these groups. This was succinctly put by one of our individual respondents:

“I am very concerned about the numbers of young people whose DNA is recorded on the database. In particular the numbers of black and ethnic minority young people. Because of this bias, I believe that there will be a likelihood that a certain group of people will be more likely than others to be taken through the criminal justice system, whereas others who may commit similarly serious crimes will not be convicted.”³⁵

- 3.36 This issue produced an interesting insight when it was raised in the House of Commons Home Affairs Committee ‘Surveillance Society’ Inquiry: during oral evidence the point was put to the Chief Executive of the NPIA and the Chair of the National DNA Operations Group. The response from the witnesses was that, as all those who were convicted were guilty of a crime, to have fewer of their records on the database would have meant fewer guilty people being convicted and that this would be a retrograde step. The point made by the Committee member who raised the issue was, however, that black men were more likely to be convicted because they were black, and therefore more likely to be on the database – not because more black men than, say, white men were guilty of serious crimes. Entanglement with the criminal justice system, and especially conviction, has a number of social consequences for families and communities, as well as compounding stigmatisation. The police approach, which was understandably focused on identifying and convicting offenders, simply did not appear to take this into account. To meet equally the two objectives of maximising convictions of offenders and of doing so in a way that is indifferent to the communities from which they come may, however, be far from simple.

Trust and co-operation

- 3.37 A further practical consequence of the disproportionate representation of some groups, to which a number of consultation respondents referred, is a loss of trust and confidence in the police, leading to a decrease in the willingness of people in communities perceived as victimised to co-operate with police enquiries. This may arise from the perception, discussed above, that being recorded on the NDNAD places an individual somehow under a generalised level of suspicion that is different from the position of other citizens, and that the police's motive in detaining people is to obtain their DNA in order to build up this database of pre-suspects.
- 3.38 Although this suggestion is consistently rejected by the Government and the police ('those who have nothing to hide have nothing to fear'), the scepticism shown by many of the organisations and individual citizens from whom the Human Genetics Commission (HGC) has heard is compounded by the apparent reluctance of police officers to have their profiles included on the Police Elimination Database. This database is used to avoid resources being unnecessarily deployed on enquiries into the origin of contaminant samples from crime scenes, where the presence of this contamination arises from the presence of a police or scene-of-crime operative carrying out their duties. We understand that it has been proposed that inclusion on this database should be made compulsory for progression to senior grades within the police service and that all new recruits should be recorded, although this proposal has apparently not been fully implemented. For reasons of solidarity, and to foster greater trust and co-operation between the police and the communities they serve, **we recommend that all serving police officers, and those whose professional duties require or permit them to come into contact with crime scenes or crime-scene samples, should have their DNA profiles recorded on the Police Elimination Database and retained; this requirement should be a condition of employment.**

'Volunteers'

- 3.39 The taking of 'irrevocable consent' from volunteers has drawn critical comments from a great many commentators, including the Nuffield Council on Bioethics³⁶ and the Home Office DNA Database Ethics Group.³⁷ It is common ground among these commentators that the current approach is unsatisfactory, and there is sufficient argument to justify a change that we need not add to it. The justifications given³⁸ for the present arrangement contain elements that appear perverse and irrelevant. One argument given is that that consent should not be revocable because its withdrawal would put the criminal justice system in a difficult position. However, rather than supporting irrevocable consent, this argues for better processes for removing DNA records so that the Crown Prosecution Service cannot adduce DNA evidence which should not be available to it (the problem that impelled the 2001 revision). The argument that withdrawal of consent should not be allowed because it might be a precursor to criminal activity does

not, however, invalidate the principle that the person consenting should retain control over whether the sample is held. The Nuffield Council on Bioethics³⁹ suggests that failure to allow the withdrawal of consent is morally unacceptable because it removes from the voluntary control of the person consenting the justification for what would otherwise be an intolerable invasion of privacy. In our view these considerations contribute to the argument for the establishment of the NDNAD on a statutory basis and **we recommend that the statutory framework for the National DNA Database should include provisions relating to consent which, as a minimum, should make it unlawful for records derived from volunteer samples to be retained in the absence of a validly obtained and subsisting consent.** In our view, the analogy often drawn with medical research, while tempting because it appeals to the public-spirited motivation of many who volunteer for forensic elimination purposes, is inappropriate because retention of DNA records has consequences that may amount to further or ongoing intrusion in the private life of the individual concerned.

A database without discrimination?

- 3.40 Many of the objections to the database on the grounds that it can hide discrimination in policing practice and result in disproportionate consequences for certain groups (especially children, those with mental health problems and black and minority ethnic communities) would be met by expanding the NDNAD so that it contained the profiles of the whole population, as well as visitors to the country. This suggestion, notably proposed by the eminent appeal court judge Sir Stephen Sedley,⁴⁰ has received considerable attention in the last few years. The issue has also been raised by the Nuffield Council on Bioethics, by the participants in the Citizens' Inquiry and in a mock trial involving young people aged 15–19 from South Wales in November 2008.⁴¹
- 3.41 The deliberations of the Citizens' Inquiry panel showed how complex and tangled the issues involved were, and although the panel's majority conclusion was that there should not be a whole-population database for a variety of practical and principled reasons, a minority still supported the idea as long as appropriate safeguards could be put in place.⁴² Although the 'jury' in the South Wales 'trial' found (by a majority of 9 to 3) against the idea of a whole-population database, the wider group of 80 observers who were polled at both the beginning and the end of the proceedings remained more evenly split, the proportion who considered a whole-population database to be an unreasonable threat to civil liberties (the substance of the charge) rising from 48% to 61%.⁴³ In a response to our consultation, the Information Commissioner did not rule out completely a whole-population database but did say that, among other things, "the creation of such a database would require the highest level of public debate to ensure that all the relevant issues and circumstances ... were fully considered."⁴⁴ What is interesting is that such a seemingly

extreme solution consistently manages to divide people and continues to generate evenly balanced debates. This was also true for the HGC when it discussed the matter at its public plenary in December 2007.⁴⁵

- 3.42 While it is hard to find unequivocal support for the proposal to create a whole-population database, it is often easy to imagine that by changing a number of contingent factors or parameters (for example guaranteeing data security, imposing severe penalties for improper use or reaping collateral benefits) the balance of argument might be shifted. Furthermore, although the obvious means that might be employed to populate a whole-population database may appear undesirable, it cannot be concluded from this that having such a database would itself be undesirable: it might, but the questions are distinct. We will therefore return to this issue when we consider future developments of the NDNAD in chapter five. For the present, however, we acknowledge the significant number of problems with the proposal. In the first place there is apparently no appetite on the part of the Government or the police to take deliberate steps to create a whole-population forensic DNA database. Not least among the problems of creating a such a database is the judgment in *S and Marper*, which appears to rule it out on grounds of international law. However, even setting this point aside for the sake of argument, there are many additional considerations.
- 3.43 One such consideration is the difficulty of sampling such a large number of people and the cost involved: this would be hard to justify for forensic purposes alone, given the enormous redundancy implied. Added to the difficulty created by the vast magnitude of the task would be the difficulty of finding an appropriate means of sampling: biological sampling is routinely carried out in healthcare contexts, but to require or expect healthcare professionals to provide sampling services to create a forensic database might constitute a violation of professional ethics. When to take samples would also be an issue – biological samples of all UK-born children have, since the late 1960s, been obtained at birth to check for certain serious but remediable medical conditions. As people grow up and become capable of understanding the implications of sampling (even though they may not have a choice) the opportunities for sampling may become rarer and their resistance more entrenched.
- 3.44 Compliance is another problem: those whom the police might most wish to have on the database (so-called ‘career criminals’) are undoubtedly those who are most likely to take steps to avoid sampling. Even if samples from people born in the UK could be taken unobtrusively, as part of routine screening, this would be unlikely to be the case for visitors to the country. Data management and data security at the level of the whole population, as already discussed, present serious challenges and risks, and public confidence is easily shaken. (The HGC’s discussion in December 2007 and, to an extent, the Citizens’ Inquiry, took place in the aftermath of a highly publicised loss, just two months earlier, of HMRC child benefit data containing details of 25 million individuals.) This was echoed by a

number of our consultation respondents: Liberty, for example, said that “it is impossible to imagine the development of a universal database that would not be hugely vulnerable to infiltration, abuse and human error”,⁴⁶ and JUSTICE agreed: “The government’s track record for the handling of sensitive personal data gives excellent reason to believe that a significant loss or misuse of such data would be inevitable.”⁴⁷ All of these arguments and uncertainties, and more, were articulated by the citizens and organisations from whom we have heard, and are perhaps best summed up by one individual who said: “This is a difficult topic and the need for ongoing debate is essential. Advantages and disadvantages need to be comprehensively identified and each point debated to achieve consensus agreement. Perhaps then, the circumstances will be right.”⁴⁸ Perhaps.

- 3.45 Whatever the conclusions of such a debate (should one ever be accomplished), and however the law may evolve following *S and Marper*, we are nevertheless convinced that the need to avoid discriminatory consequences is not in itself a sufficient reason to institute a whole-population database.

Notes to chapter three

1. HGC (2002), chapter 1.
2. For example, Article 1 of the Universal Declaration on the Human Genome and Human Rights: “The human genome underlies the fundamental unity of all members of the human family, as well as the recognition of their inherent dignity and diversity. In a symbolic sense, it is the heritage of humanity.” In *Inside Information* we drew attention to this dual implication by setting out the principle of genetic solidarity and altruism, and that of privacy, as two corollaries of the principle of respect for persons. See HGC (2002), chapter 2.
3. Consultation response 56 (individual).
4. Consultation response 14 (JUSTICE).
5. Human Tissue Act 2004; Human Tissue (Scotland) Act 2006. These provisions came about following very strong recommendations by the HGC in *Inside Information* that there should be an offence of non-consensual or deceitful obtaining and/or analysis of personal genetic information for non-medical purposes. See HGC (2002), para.3.60.
6. Reversing this principle, it is possible to draw inferences from certain genetic sequences to phenotypic traits, which is potentially of use in crime investigation. We will consider this in Part 2.
7. Consultation response 8 (ESRC Genomics Network).
8. Prainsack and Kitzburger (2009), p.70.
9. We have already remarked, in chapter one, on the shadow cast by the eugenics movement over modern genetics and the particular interest of Francis Galton, the originator of eugenics, in linking characteristics of intelligence and race to phenotypic features such as fingerprints. The 19th century interest in pseudo-sciences such as physiognomy (which claimed that an individual’s ‘character’ or personality could be inferred from the features of the human face), phrenology (which linked cranial features to mental capacities and behavioural propensities), and palmistry (which claimed to recognise the so-called ‘murderer’s thumb’) likewise cast their shadow over contemporary study of how genetic traits condition behavioural and psychiatric dispositions.
10. Council of Europe Convention for the Protection of Human Rights and Fundamental Freedoms, transposed into UK law by the Human Rights Act 1998.
11. Council of Europe Convention for the Protection of Human Rights and Fundamental Freedoms, Art.8(2).
12. Judgment, para.60.
13. Consultation response 21 (Dr Ruth McNally).
14. Consultation response 22 (Nuffield Council on Bioethics).
15. Consultation response 21 (Dr Ruth McNally).
16. Consultation response 19 (Royal College of General Practitioners).
17. Consultation response 14 (ESRC Genomics Network).

18. GeneWatch cites the reference: www2.ohchr.org/english/bodies/crc/AdvanceVersions/CRC.C.GBR.CO.4.pdf, para.37 (we have not been able to verify this reference).
19. "Protecting Rights, Protecting Society", speech to the Intellect Trade Association, 16 December 2008.
20. Home Office (2009), p.6.
21. Meg Hillier MP, HC *Hansard*, 1 September 2008, col.1565W, cited in Anderson et al. (2009), p.23.
22. Consultation response 11 (NO2ID).
23. Home Office (2009). See HGC's response on the HGC website (www.hgc.gov.uk).
24. Consultation response 17 (Information Commissioner).
25. PACE 1984, s.24.
26. Home Office (2005).
27. Bennetto (2009), pp.28–29.
28. Consultation response 11 (NO2ID).
29. Consultation response 23 (Liberty).
30. Bennetto (2009), pp.39–40.
31. Citizens' Inquiry participants (2008), p.34.
32. House of Commons Home Affairs Select Committee (2007).
33. See www.npia.police.uk/en/14292.htm
34. Bennetto (2009), pp.39–40.
35. Consultation response 6 (individual).
36. Nuffield Council on Bioethics (2007), para.4.57ff.
37. National DNA Database Ethics Group (2008).
38. HM Government (2005).
39. Nuffield Council on Bioethics (2007), para.4.60.
40. Sedley L.J. suggested this approach, in a lecture delivered in November 2004 at the Faculty of Law of the University of Leicester, as an academically satisfying solution to the risk of discrimination arising from the current population of the NDNAD. He made it clear, when addressing the HGC in May 2008, that he was not advocating it personally as a practical solution.
41. The charge in the 'trial' was: "That the Government would be guilty of causing an unreasonable threat to the civil liberties of the citizens of the United Kingdom by the creation of a Universal DNA Database" – see www.techniquet.org/DNA/ProjectReport.pdf
42. Citizens' Inquiry participants (2008), p.22.
43. Iredale et al. (2009).
44. Consultation Response 17 (The Information Commissioner).
45. For audio recording and minutes, see www.hgc.gov.uk/Client/Content.asp?ContentId=795
46. Consultation response 23 (Liberty).
47. Consultation response 14 (JUSTICE).
48. Consultation response 15 (individual).

Chapter four

Forensic utility

“To keep retaining DNA profiles and samples of innocents, evidence must be shown that retaining DNA profiles and samples of innocents makes a significant difference in detecting and prosecuting criminals.”

— Individual response 10 to HGC consultation

Introduction

- 4.1 We noted in chapter two that the policy orientation of the National DNA Database (NDNAD) appears to have drifted from confirming suspicions to identifying suspects. The implicit expectation was that these would be found among the group of people arrested for an increasing range of offences, or (less plausibly) among those who would volunteer to have their details recorded and retained (for example, after taking part in an intelligence-led mass screen). Furthermore, there may be an expectation, buried within the purpose of ‘preventing crime’, that the existence of the database and either the threat of being recorded or the fact of having been recorded on it would act as a discouragement or deterrent to those of criminal intent.¹
- 4.2 If the primary purpose of the NDNAD is, as the National Policing Improvement Agency (NPIA) suggests,² to be a police intelligence database leading to the identification of offenders, it has certain limitations and redundancies, as we observed in chapter two. There are also a number of practical and technological limitations: not all crimes can be located at a crime scene where the offender was present and that can be searched for DNA traces, although most serious crimes against people and property can be. However, not even in all these cases can DNA evidence be found. When evidence is found it may be degraded (leading to only a partial profile) or mixed (so that it is difficult to disentangle the markers relating to each individual). Furthermore, the scene-of-crime and laboratory work, though significant advances have been made since ‘DNA fingerprinting’ was first developed, remain technically demanding, time-consuming and relatively expensive. Given that we cannot create the kind of database that would be most useful, is it nevertheless useful to have the kind of database that we can create? This leads to the related question: are there ways of making the database we can have more effective? The first question is the subject of the present chapter. We will turn to the second in chapter five.
- 4.3 Finally, it is important to remember that obtaining a match via the database is not sufficient to identify an individual as an offender – it is still necessary to track down the person and build a case against them that takes into account that the presence of their DNA at a place where an offence has been committed might have an innocent explanation. This point is extremely important, particularly given the possibility that DNA evidence may be planted at the scene of a crime in a deliberate attempt to cast suspicion on a particular individual and/or to divert suspicion from the real offender. (An example would be leaving a cigarette butt with saliva traces from an innocent person at the scene of a crime.) Furthermore, a DNA match alone cannot establish the criminal intent (*‘mens rea’*) of a person in committing an act and it will not shed light on circumstances which may turn an act into a crime (such as whether or not a woman consented to sexual intercourse in a case of suspected rape).

The rhetoric of conviction

- 4.4 One of the features that has obscured the need for reasoned debate, informed by evidence, about the value of the NDNAD has been the widespread use of exaggerated rhetoric in public discussions, media reports and even official documents. This is perhaps not surprising: crime, particularly against persons and property, is a highly emotive subject, especially for those personally affected. Furthermore, fundamental decisions about implementing the NDNAD and investing in its use could have the potential to affect political, professional and scientific careers, and even the fortunes of governments. However, it is important to recall that despite the attention paid to the value of the NDNAD in investigating serious violent and sexual crime, and terrorism,³ the vast majority of uses of the NDNAD have been for so-called ‘volume crime’. This comprises the majority of all offences committed and includes street robbery, burglary and theft, vehicle crime, criminal damage and drugs offences.⁴
- 4.5 In support of the NDNAD considerable use is made of high-profile cases, such as the conviction of Steve Wright for the murder of six Ipswich women in November and December 2006, and that of Mark Dixie, who killed Sally Ann Bowman in 2005. On the other hand, the power of DNA to resolve miscarriages of justice (for example, in the case of Sean Hodgson, jailed for 27 years for murder of Teresa De Simone in 1979) is also highlighted. These cases have become totemic – their repetition, constantly recalling them to memory, reinforces attitudes towards them, as if they were new cases. In her direction-setting policy speech in December 2008,⁵ the then Home Secretary, Jacqui Smith, directly invoked the grief of the victim’s parents: “I have real sympathy for all those with concerns that any move could undermine a system that helped trap Sally Ann’s killer. And I want to reassure Sally Ann’s father that I will not let that happen.” Having cited just two cases (those of Dixie and Kensley Larrier) she reached the following conclusion: “These cases and others tell me that the DNA database is crucial to public protection.”
- 4.6 In the subsequent consultation document⁶ that set out specific proposals to comply with the *S and Marper* judgment, there is a quotation from Sally Ann Bowman’s mother:

“It [the NDNAD] is the only deterrent that will stop serious crimes being committed. I am a mother of four and I have five grandchildren, I would not worry about any of their details being held on a computer and everyone in our family feels the same way. I am sick to death of the people who complain about this idea. They have no idea what families like mine have been through.”

This is conspicuous because it is the only quotation in the entire document, and it is used powerfully to assert a view – that the existence of the NDNAD is a deterrent – for which no other evidence is provided.

- 4.7 The anecdotal evidence is not all one way, however. This is shown by the Easton case,⁷ in which investigators went to extraordinary lengths to imagine the facts of a case that could fit with the findings of a DNA search. (The case concerned a man disabled with Parkinson's disease who was charged with burglary as a result of a false DNA match. In order to explain how he could have committed the crime the prosecution had to invent highly implausible hypotheses to discount the circumstantial anomalies.) The Omagh bombing trial, which led ultimately to acquittal, has also been cited as a case of over-reliance on DNA techniques. Moreover, the danger of unquestioning reliance on the results of DNA analysis was illustrated by the very first forensic use of DNA – the Pitchfork case – in which the offender was initially eliminated from the police enquiry because he provided someone else's biological sample in place of his own.
- 4.8 The fallacy of drawing general conclusions from individual cases, and the use of rhetorical devices (repetition, appeals to sentiment or to presumed majority views, etc.) to assert or reinforce beliefs, should not replace sound evidence and reasoned argument. They also indicate a need for caution, since a well-confirmed belief can lead to over-confidence in the technology, which, when it is contradicted, can in turn lead to an equally inappropriate loss of confidence. A more temperate debate than the one we have had so far is essential.

Defining forensic utility

- 4.9 We have coined the term 'forensic utility' (by analogy with the familiar concept of 'clinical utility'⁸) to describe the best way of estimating the value of the NDNAD in relation to its primary purpose of correctly identifying offenders. It is our contention that this purpose is not well defined, and we should also recall that there may be subsidiary purposes (for example, deterrence) or collateral effects (for example, on the type of offences committed or the way in which they are prosecuted) that ought to be taken into account in evaluating the more general desirability of the database.
- 4.10 By 'forensic utility' we mean something like the following: the extent to which a database produces measurable improvements in the police's performance in correctly identifying and distinguishing offenders in relation to particular reported crimes. A comparative evaluation of forensic utility would therefore need to take into account the alternative investigation strategies available and their respective costs and benefits. Although it is hard to define, we think that it is important to find the best possible measure to allow evaluation of the database in order to guide subsequent decisions to expand or reduce its size, or to make use of it in different ways. Without this, as we have said, it is impossible responsibly to evaluate or account for the expenditure of public resources on the database and on policing in relation to it.
- 4.11 This notion of forensic utility is therefore not merely a measure of the database's quantitative effectiveness (the frequency with which

that it produces matches and the reliability of these matches), nor of its efficiency (taking into account resource costs) in identifying offenders. We recognise that forensic utility will be hard to measure and that it is possible to entertain significant differences of opinion about what factors should be taken into account and what standards used. It can be argued, for example, that the database should be evaluated in terms of the rate of convictions of offenders identified through DNA evidence. This appears convenient in that the convictions are certainly measurable, but it does not take into account whether the offender was or might have been identified using conventional methods. On the other hand, a conviction count may underestimate the utility of the database since it does not include cases that for one reason or another do not progress to trial.

4.12 In our public consultation, without wanting to entangle our respondents in the difficulties of defining ‘forensic utility’ (and partly to permit a definition to be inferred by putting the question the other way around) we asked what evidence they thought would be required to demonstrate the forensic utility of the NDNAD.⁹ We suggested some possible measures as examples of the sort of things we thought they might consider:

- (i) identifying suspects more quickly or economically than other investigative techniques would have made possible;
- (ii) identifying suspects where other investigative techniques would not have been able to do so;
- (iii) cost-effectiveness in detecting all crimes against persons and property, or being especially effective in relation to serious or violent crime; and
- (iv) demonstrating effectiveness in securing convictions of suspects identified using the NDNAD.

4.13 In doing so, we were criticised by at least one of our respondents for linking utility too closely with considerations of financial cost. It was pointed out to us that cost will undoubtedly decrease over time and indeed, for certain sorts of operations, may decrease because of efficiency savings and technological innovations brought about as a result of a high level of use. Some took the view that cost was irrelevant in any case:

“Are we saying that we should use DNA to catch more criminals if it is cheaper to do so? This should not be the case – if it is a good tool, it should be used even if it is relatively expensive. Conversely, if the tool is a threat to liberty and the privacy of the innocent individual, it should not be used regardless of how cheap it becomes.”¹⁰

- 4.14 However, others felt that cost-effectiveness was one consideration that ought to be taken into account:

“In JUSTICE’s view, the basic utility of any forensic measure is whether it increases the ultimate likelihood of correctly identifying an individual who has committed a criminal offence. However, in addition to accuracy, we also recognise the value of making criminal investigations faster and more cost effective.”¹¹

- 4.15 As a “crude starting point”, JUSTICE proposed that it should be possible to “identify the number of cases in which evidence from the database was admitted into evidence, then calculate the proportion of cases which resulted ultimately in a conviction”.¹² However, there are two questions in play here: one is about the value of DNA as evidence, while another is about the value of a DNA database in the context of an investigation. We must be careful to distinguish these ‘evidential’ and ‘heuristic’ senses. It is the second – the heuristic sense – in which we are principally interested, since our deliberations arise from concerns about holding a database of DNA profiles and using this to identify suspects for particular investigations, rather than the use of DNA as evidence confirming those suspicions at trial. The issue of the use of DNA as evidence is certainly important (it was a key issue identified in the Citizens’ Inquiry), but it does not depend on the existence of the NDNAD. Nor does it contribute directly to an assessment of the utility of the NDNAD, since, whenever a DNA sample is available from a crime scene, a confirmatory sample may be taken from anyone arrested on suspicion of having committed the offence, regardless of how they were identified as a suspect.

- 4.16 The Economic and Social Research Council (ESRC) Genomics Network, to whose appraisal of the acceptability of the database the concept of forensic utility is central, suggests a number of candidate factors:

“Measures of utility might include improvements in detection and conviction rates, success in preventing offending behaviour, reduction of the cost of investigations, reduction in overall crime statistics, reduction of intrusion by police investigators into the lives of innocent people, avoidance of false convictions and miscarriages of justice, or any combination of these.”¹³

- 4.17 We certainly agree that a purely statistical approach, based on match and/or conviction rates divided by cost, is reductionist¹⁴ and something more sensitive is clearly required. It would not do, for example, to include false convictions as positive recommendations for the database, as a number of our respondents pointed out. However, we also recognise that a balance needs to be struck between what is desirable and what is achievable. There are clearly operational reasons why independent (especially contemporaneous) qualitative analysis could not be used as a general approach. Therefore, **we recommend that the National DNA Database Strategy Board should define and consult widely on an appropriate definition and acceptable**

measures of forensic utility. These should support the evaluation of the role played by the National DNA Database in the identification of offenders, while making it feasible to collect prospectively the evidence necessary for the evaluation in an operational context.

Evaluating forensic utility

4.18 Even if we can settle on a useful definition of forensic utility, evaluating the forensic utility of a particular investigative tool such as the NDNAD presents challenges. Respondents to our consultation pointed to the difficulty of disentangling the role played by DNA evidence from that played by other evidence in the investigation of crime. The campaigning group NO2ID drew attention to the variety of different ways in which information is reported and the difficulty of drawing conclusions from it. It was cynical about what it saw as the ‘marketing’ of the database by drawing attention to high-profile serious crimes (rapes and murders) which are claimed to have been solved as a result of it:

“That DNA is involved in the detection of less than 0.5% of all recorded crime suggests that it is far from cost-effective. In order to make a judgement about cost-effectiveness, the public must be told exactly how much is being spent on DNA collection, processing, matching and retention. Until these figures are regularly published and properly audited, there is no way to determine cost effectiveness.”¹⁵

4.19 GeneWatch UK concluded likewise:

“...although there are limitations to current evidence, it is already sufficient to demonstrate that current policy and legislation is disproportionate to the need to tackle crime, because the recent massive expansion in the size of the DNA Database has failed to increase the proportion of crimes detected using DNA.”¹⁶

4.20 It is important to distinguish two senses in which DNA evidence can be said to be necessary to the efficient operation of the criminal justice system: one sense is where it is a necessary – although not sufficient – condition of demonstrating guilt (i.e. there would be no conviction without it); the other is where it is a necessary link in the investigation, as a condition of the discovery of further evidence that is then sufficient (without the DNA evidence) to demonstrate guilt. It is in this second sense that the ‘necessary’ role of DNA evidence is being questioned here. There is also a further sense in which the role of DNA evidence can be seen as necessary to the effective operation of the criminal justice system, namely when it makes an investigation significantly more efficient (for example, preventing further offences that might have taken place if there was additional delay, for example in the case of a prodigious serial killer).

- 4.21 The Nuffield Council on Bioethics, referring us to its own report, also pointed to a lack of evidence to justify retaining records relating to unconvicted people: “Statistics about ‘matches’ to unconvicted people on the Database do not tell us whether these cases actually resulted in a conviction, or whether DNA evidence was essential to the case.”¹⁷ This view was echoed by Liberty, which drew attention to what it described as misreporting of the role of DNA in solving high-profile, serious crimes when it was claimed that retention of DNA ‘led’ to the identification of the suspect. They point out that both Steve Wright and Mark Dixie were arrested following their most serious crimes for unconnected reasons that were, however, sufficient on their own to require a new DNA sample to be taken (Mark Dixie was arrested for taking part in a pub brawl, while Steve Wright was identified as a suspect through CCTV footage). Therefore it should not be claimed that the retention of a previous sample led to their convictions. Although the case now most consistently cited by the Home Office as an example of the utility of the NDNAD, that of Kensley Larrier,¹⁸ was one in which the only available link was from DNA, many individual cases reported as ‘DNA detections’ do not themselves support the creation of an extensive database containing records of people who have not been convicted of an offence.
- 4.22 There is one body of evidence that offers to show that the reason for retaining a DNA profile is more than arbitrary in relation to the risk of committing a future offence. In effect, it says that an individual’s involvement with the criminal justice system on two separate occasions is linked; and furthermore that an individual who is arrested in relation to an initial, trivial offence for which no proceedings or conviction ensue is significantly more likely than a randomly selected member of the general population to be arrested on a subsequent occasion and convicted of a more serious offence. This is controversial because, depending on the explanation offered, it may appear to challenge the presumption of innocence in relation to the initial charge.
- 4.23 The notion of a ‘criminal career’ is well established by criminological research, and from this perspective, and that of psychological and sociological theory on which it draws, it makes little sense to assume that such a career arises only at the moment of an individual’s first conviction. The claim that there is a progression in the typical criminal career (from relatively low-impact to serious crime) is also supported by evidence.¹⁹ However, this progression in verified criminal activity implies that the individual was convicted in the first instance (not merely suspected) and so it still does not amount to an argument for retaining profiles from unconvicted people. Even if it were possible to show that those arrested but not convicted, cautioned, or conditionally discharged were more likely than a randomly selected member of the general population to be convicted subsequently, this would still not amount to an argument supporting the utility of the NDNAD. For this, a number of additional steps are required.

4.24 On 2 and 3 October 2008, the ESRC Genomics Policy and Research Forum held an expert workshop, entitled ‘Genetic Suspects: Emerging Forensic Uses of Genomic Technologies’. This brought together social scientists, forensic scientists, criminal justice practitioners, members of regulatory bodies and others. In the final session, participants agreed that a full understanding of the operation and use of forensic DNA technologies in the UK is severely hampered by a lack of available information about the NDNAD, its use in police investigations and its impact on crime prevention. A statement was subsequently agreed and endorsed by the majority of those who participated in the workshop. The statement was as follows:

“It is vital that systematic research be undertaken into the operation and employment of forensic DNA technologies in the UK, and their impact on policing, crime prevention and control. Such research is essential for meaningful evaluation of the forensic utility of these technologies, their effective management and governance, and to inform policy decisions on how such technologies should be developed, deployed and regulated. The availability of such research, and its incorporation into governance and policy, is crucial to ensure transparency, accountability and public confidence in the forensic use of DNA technologies.”²⁰

4.25 Given the standing and experience of many of those who put their names to this statement²¹ and the urgency and importance attached to their recommendation (“vital”, “essential”, “crucial”), we feel this merits very careful attention. Moreover, we believe it should encourage the Home Office and other potential funders to instigate such research urgently. The statement’s authors go on to identify four categories of evidence collection and research:

- (i) systematic data collection on the effectiveness of forensic DNA technologies in the investigation of crime and the prosecution of criminals, to permit evaluation of the absolute and comparative utility of forensic DNA technologies in a number of dimensions;
- (ii) analysis of data on detection rates in relation to dates of sample acquisition and categorisation of individuals in variety of ways (age, sex, ethnic background, employment status, etc.);
- (iii) attentive collection of data showing the utility of developing, novel or expanded uses of forensic DNA technologies; and
- (iv) criminological and sociological research on the impact on individuals, society and the criminal justice system of the use of forensic DNA technologies.

4.26 They also call for the publication of this evidence and the results of this research, and their evaluation by independent oversight bodies, in order to maintain public confidence.

- 4.27 We agree with GeneWatch UK, with the Home Affairs Select Committee and with the ESRC Genomics Network expert workshop, among others, that there is currently insufficient evidence collected to estimate the forensic utility of the NDNAD. We are aware through HGC membership of the NDNAD Strategy Board that this issue has been recognised and the Board is looking for ways in which it can be addressed. Therefore **we support the efforts that are currently being made by the National DNA Database Strategy Board to identify and provide meaningful information that can be placed into the public domain, and we recommend that data supporting evaluation of the forensic utility of the National DNA Database should be collected and published by the National DNA Database Strategy Board or the National Policing Improvement Agency National DNA Database Delivery Unit. An evaluation of such data should be conducted by an independent body and placed in the public domain.**

Retention of samples

- 4.28 One aspect of the database that we do not consider to contribute significantly to its utility is the retention of biological samples. There are three principal arguments for the long-term retention of samples: (1) quality assurance; (2) the need to preserve an original sample for checking; and (3) the need to upgrade profiles. We accept that there is a need to keep crime scene samples even after conviction, where there may conceivably be a need to examine whether there has been a miscarriage of justice (as in the case of Sean Hodgson, mentioned above). However, we cannot see any need for long-term retention of subject samples, for the following reasons: if the identity and whereabouts of the subject are known, it will be possible, and not disproportionately expensive or difficult, to obtain a new sample for analysis; conversely, if the subject's whereabouts are not known, having a DNA sample is unlikely to assist in locating them; and finally, the argument that there may be a future need to upgrade the profiles by analysing more loci is unconvincing.
- 4.29 If the argument for the need to upgrade profiles were allowed, it could in theory be employed indefinitely. In practice, however, there is likely to be some limit that is related to the absolute size of population from which a possible suspect for any crime being investigated may come, beyond which circumstantial factors begin to play a relatively greater role than DNA evidence. For example, even if the probability of an adventitious match across all databases in Europe is high, other factors may suggest that for a crime committed in Lewisham, investigation of a matching resident of London is likely to be a more promising line of enquiry than one for a resident of Lisbon or Lugano. As long as DNA evidence is not sufficient (on its own) to secure a conviction (and we strongly believe that it should never be treated as such), such additional enquiries will always be necessary.

- 4.30 The persuasiveness of the argument to retain samples comes from the lack of standardisation of short tandem repeat loci among jurisdictions that might share criminal justice information. There is currently considerable variation in the number and nature of the markers used, even within Europe, giving rise to large variations in match probabilities for a given profile in relation to different national databases. However, there are many other issues which make sample exchange between European (and other) jurisdictions problematic. For example, ownership of databases varies from country to country as do the laws governing their use. We feel that while these areas are being addressed there will be a natural trajectory towards standardisation of marker sets.
- 4.31 We note that the Council of Europe recommendation on the analysis of DNA within the framework of the criminal justice system states that “Samples or other body tissues taken from individuals for DNA analysis should not be kept after the rendering of the final decision in the case for which they were used, unless it is necessary for purposes directly linked to those for which they were collected.”²² We think that this recommendation strikes an appropriate balance between the foreseeable need to return to the sample and the continued interference with individual privacy entailed by continuing to hold such samples. In our view, the arguments for retention of biological samples are slight, although we recognise that destroying them is not straightforward. Therefore, **we recommend that there should be a move towards the destruction of subject samples when profiles have been loaded to the National DNA Database; and that the UK should continue to support efforts to standardise sets of markers with other countries in Europe and elsewhere with whom the sharing of data for criminal intelligence purposes may be desirable.**

Notes to chapter four

1. We will return below to the question of the extent to which the database functions as a deterrent, and the possibly counter-productive extent to which it changes offending behaviour and stigmatises offenders.
2. See references in chapter two.
3. This latter aspect was given prominence by the Strasbourg judges in *S and Marper*.
4. Based on the Association of Chief Police Officers definition of volume crime: www.nga.org/Files/pdf/0903DNAAPCOMANUAL.PDF
5. “Protecting Rights, Protecting Society”, speech to the Intellectual Trade Association, 16 December 2008.
6. Home Office (2009).
7. Cited in consultation response 21 (Dr Ruth McNally).
8. Genetic testing in a clinical setting is commonly evaluated according to the ‘ACCE’ framework, the components of which are *analytical validity* (the laboratory performance of a genetic test: its ability to measure accurately and reliably the genotype of interest), *clinical validity* (the accuracy with which a test can predict the presence or absence of the phenotype), *clinical utility* (the likelihood that applying the test will lead to an improved outcome), and the *ethical, legal and social implications*.
9. Question 5; we gave, in parentheses, a cursory definition of this concept as ‘its value as a tool in the identification and prosecution of criminals’.
10. Consultation response 18 (individual).
11. Consultation response 14 (JUSTICE).
12. *Ibid*.

13. Consultation response 8 (ESRC Genomics Network).
14. In her response to our consultation, Dr Ruth McNally asserts that “the very term ‘forensic utility’ suggests the use of a utilitarian framework for evaluating the database, according to which the ends could be used to justify the means ... the danger with such an evaluation is that it might be uninformed as to how the bottom line [efficiency in generating suspects and convictions] is arrived at.” As a counterbalance to the tendency to focus on statistics about the NDNAD alone, “a review of existing qualitative research is proposed and the commissioning of new research which would follow the ‘chain of custody’, building up a richer and historically-informed picture of the database as a facility situated within, and dependent upon, a broader network of practice, artefacts and institutions, which collectively co-produce this quality which might, for want of a better phrase, be called ‘forensic utility’.” (Consultation response 21).
15. Consultation response 11 (NO2ID).
16. Consultation response 12 (GeneWatch UK).
17. Consultation response 22 (Nuffield Council on Bioethics).
18. Kensley Larrier’s case is cited in both the Jacqui Smith speech and the Home Office consultation paper referred to above. Briefly, Larrier was arrested in May 2002 for the possession of an offensive weapon, which led to his DNA profile being loaded onto the DNA database, although proceedings against him were subsequently discontinued. In 2004 a DNA sample was obtained from a rape committed in the North of England. This sample was speculatively searched against the NDNAD and matched against the acquittal sample. Larrier was arrested, and charged with the offence in November 2004. He was convicted in June 2005, jailed for five years and entered on the sex offenders register for life.
19. See for example Townsley et al. (2006).
20. See www.genomicsnetwork.ac.uk/media/HGC%20NDNAD%20expert%20workshop%20response.pdf
21. A full list of participants is available at www.genomicsnetwork.ac.uk/media/HGC%20NDNAD%20expert%20workshop%20response.pdf
22. Council of Europe (1992) Recommendation 8.

Chapter five

The future of the National DNA Database

Introduction

5.1 In this chapter we will look at ways in which the ‘forensic utility’ of the National DNA Database (NDNAD) may, in the future, be increased and the potential concerns associated with these developments. These might be the result of technological advances that could arise from current research, innovations from other areas, or new ways of managing or using the data. We will also discuss potential effects of changes in the social context in which the database is modified and used, and the role that concerns about new developments may play in the implementation of technological advances, the development of legal provisions and the shaping of public attitudes.

Increasing utility

The size and composition of the database

5.2 **Increased size** – It might be thought that the most obvious way in which the utility of the NDNAD could be improved is to increase its size: the more people whose profiles are recorded on the database, the greater the chance of obtaining a match from a crime-scene sample. At an operational level, there is anecdotal evidence that obtaining a DNA sample for its long-term rather than immediate value is at the forefront of some police officers’ minds when arrests are made. For instance, an anonymous police officer was quoted in the *Daily Mail* on 4 June 2009 as saying: “We are often told that we have just one chance to get that DNA sample and if we miss it then that might mean a rape or a murder goes unsolved in the future.”¹ This confirms the view of the retired senior police officer who we quoted earlier in our report² and the suspicions of some of our consultation respondents. As one respondent, who wrote that her daughter had been arrested and held in a police cell for 15 hours, told us: “Of course, the aim of this arrest of an innocent person was to document her fingerprints, photograph and obviously her DNA. Her DNA is of paramount importance to the police as it serves as a link to her entire family’s DNA.”³ Despite these concerns it must be remembered that, in order to arrest somebody, an officer must have ‘reasonable grounds’ to suspect the person of having committed an offence.⁴ An argument could, in theory, be built around a claim that police possess reliable expertise in recognising those who present a higher risk of offending, but we have not found anyone willing to make such an argument. Such an argument would, in any case, be highly controversial and difficult to defend, and is not one that we would support.

5.3 **A whole-population database** – Some people have proposed that, for a variety of not necessarily compatible reasons, the optimum approach would be to create a whole-population database, containing the DNA profiles of every person resident in or visiting the UK. This follows the logic that a larger database is more useful than a smaller one, while at the same time avoiding the sort of criticisms of

discrimination that selective sampling of the population (whether as a result of suspicion by the police or on other grounds) would attract. Liberty identified the potential for this consequence to follow from the existing approach when, in response to our consultation, it warns “that if collection of DNA samples continues at its present rate, a tipping point will be reached whereby arguments for further retention roll-outs will gain greater attraction, particularly in response to concerns about discrimination and stigmatisation.”⁵

- 5.4 In any case, while the indiscriminate expansion of the database provides one response to the potential discriminatory effects of a partial population database, such an approach would be efficient only if each member of the population were as likely to commit an offence as the next person. The likelihood of an immediate match when a new crime scene profile is uploaded to the NDNAD has increased steadily between 2003/04 and 2008/09 (from about 44% to about 58%).⁶ During that period the number of subject profiles added has been roughly ten times the number of crime scene profiles added in any year for which figures are available, implying that nine out of ten subject samples are redundant for future crimes. A more efficient way of increasing the utility of the database may therefore be to improve the composition of the database by adding predominantly those at significantly increased risk of future offending.
- 5.5 **Improved composition** – Efforts have been made to calculate an optimum size for the NDNAD. In its strategic plan *Confident Communities in a Secure Britain: The Home Office Strategic Plan 2004-08*, the Home Office estimated that half of all crime in England and Wales was committed by a stable pool of 100,000 offenders, with just 5,000 offenders being responsible for 9% of all crimes.⁷ It went on to say, however, that “most of these [100,000] offenders are known to the police and other agencies” and are therefore, by implication, already recorded on the database, although there is a 20% turnover each year, with 20,000 new offenders estimated to join the pool of prolific offenders to replace a similar number who leave it. (We note that this is a substantial number in relation to the number of new profiles added to the database each year – around 70,000 in the two most recent years for which data is available.⁸) It is not clear where the data on which the claim about the 100,000 core offenders was sourced (the source is described as ‘Home Office’) nor whether those who commit the remaining half of crimes are ‘occasional’ or ‘one-off’ offenders. However, we can infer from these figures that half of all crimes are committed by approximately 2.2% of the people who are currently recorded on the database (assuming that those who are ‘known to the police’ have previously been arrested and their profiles stored on the NDNAD). In this connection we note that others, for example GeneWatch UK and the Nuffield Council on Bioethics, have concluded that putting more effort and resources into the recovery of DNA samples from crime scenes could yield significantly better detection rates than the indiscriminate expansion of criminal justice samples taken from arrestees; we share this view.

- 5.6 There is an obvious attraction in the targeted collection of offenders' profiles, as it may mean reducing the number of innocent people on the database and, indeed, a contraction of its overall size. If all crimes were committed by 'career criminals' and the police were effective at identifying, arresting and obtaining profiles from these, a smaller database restricted to such people would be relatively efficient. However, as we observed in chapter three, the fewer people recorded on the database, the greater the likelihood of discrimination against those who are included (without having been convicted of an offence) and thus any stigmatisation is proportionately greater.

Advances in technology

- 5.7 Advances in technology can be expected to improve the functioning of the NDNAD over time, as they have of technologies and databases, such as scientific and medical research databases, in similar or related fields. We can assume, without too much risk of error, that the technologies involved will become progressively faster, cheaper, more automated and easier to use (perhaps eventually requiring no special expertise). We can imagine a point in the future when an officer arresting a suspect will be able to take a DNA sample, obtain a profile and search it against records on the database, all without the need to return to the police station. We certainly anticipate that such a time will come.
- 5.8 **Improved sample analysis** – Perfectly adequate subject samples are already easy to obtain via simple swabbing of the inside of the cheek. The collection of useable samples from crime scenes is being improved by a mixture of crime scene, laboratory and bioinformatic techniques, including 'low copy number' (LCN) and 'DNAboost', allowing useable profiles to be extracted from ever-smaller biological traces and the DNA of individuals to be reliably separated from mixed or contaminated samples. LCN DNA analysis is a technique developed by the Forensic Science Service (FSS) that allows the amplification of very small amounts of DNA, from just a few cells, for analysis. The technique caused controversy when its use was criticised by the judge who cleared Sean Hoey, suspected of involvement in the Omagh bombing of 1998.⁹ This resulted in suspension of the use of the technique until the final report¹⁰ of a review instigated by the Forensic Science Regulator led to the technique being vindicated. However, the controversy highlighted the dangers of reliance on DNA techniques and their ability to raise public suspicions. DNAboost is proprietary software brought into use by the FSS from 2006; it involves applying an algorithm which allows the profiles of distinct individuals to be separated from mixed or contaminated samples.
- 5.9 **Privacy-enhancing technologies** – While it is difficult to predict the exact timing or nature of further developments, it is inevitable that such developments will permit the use of DNA in more powerful and efficient ways while, at the same time, presenting new challenges and risks, in particular in relation to personal privacy. One area of

development is so-called ‘privacy-enhancing technologies’: these are built-in computer tools, applications and mechanisms that allow users to protect the privacy of personally identifying information provided to, and handled by, online or linked services or applications. For example, the Information Commissioner suggests a ‘privacy-friendly solution’, where persuasive arguments are made for the retention of DNA profiles but no such justification exists for retention of the Police National Computer (PNC) record:

“... after a set time rather than continuing to have access to both the DNA profile and nominal information on PNC the latter could be rendered unavailable for searching using identifiers such as name etc. Making nominal records unavailable for searching in this way reduces the privacy risk that they may be accessed wrongly or misused in any way. However although the record would not be searchable by conventional means that record could still remain and when a match of the associated DNA profile against a scene of crime sample took place then the record would be ‘unlocked’ so the nominal details were available once more for use by the police in investigating that crime.”¹¹

- 5.10 **Advances in non-DNA technologies** – DNA-related technologies are not the only area in which advances will be made and it may well be the case that, owing to unforeseen conditions, non DNA-based approaches may come to demonstrate greater operational utility. For the purposes of confirming identity, fingerprinting remains operationally superior to DNA profiling and continues to advance: the IDENT1 system, which links all UK police forces with a central database of fingerprint records, currently has more subject records (over 7.5 million in 2008) than the NDNAD (even though, unlike the NDNAD, the records of those acquitted of charges against them are deleted), and ‘Livescan’ technology allows digital scanning of an arrestee’s fingers and palm to be transferred to IDENT1 and searched against existing records to confirm identity in less than ten minutes. Hand-held digital fingerprint scanners are now being introduced that allow the virtually instantaneous exchange of information between an officer on the street and the central database. Other biometric measurements that are more effective and discriminating for identification purposes, such as iris scans, are also being developed further.

Improved searching

- 5.11 **Enhanced marker sets** – There are several ways in which the manner that information is recorded and searched on the NDNAD could improve the database’s overall effectiveness. While the current discriminating power of the database is extremely high (with a match probability of approximately one in a trillion¹²), the number of markers recorded could be increased from the current ten, or more powerful markers (those with more variability within the population) could be added. This may assist in two ways: firstly, where only a partial crime-scene profile is available, thereby making some of the

markers in the profile ineffective, or where the crime scene DNA sample is contaminated, it would increase the chances of obtaining a reliably discriminating match; secondly, where different criminal jurisdictions use different sets of markers, only some of which are common, analysing additional markers used elsewhere similarly offers an increased power of discrimination.

- 5.12 **Familial searching** – Further uses can be made of existing profiles through the technique of familial searching. A partial match between a crime scene sample and a record on the NDNAD can indicate the likelihood of a family relationship between the person to whom the NDNAD record relates and the person whose DNA was recovered from the crime scene. This can be used as the basis of further inquiries. Such an investigative approach has been used successfully in a number of cases and is potentially powerful. However, this exceptional and intrinsic characteristic of DNA, that it is inherited and shared in measure with the degree of biological relatedness between individuals, allows information about those who have not been convicted to be inferred from the profiles of relatives who have. Thus it makes problematic the claim that the scope of the database could be restricted clearly to a single category of person (i.e. those who have been convicted of an offence), since in order to maintain this claim it would be necessary to restrict the use of familial searching. This is perhaps why the technique has been used to date only with circumspection. As well as effectively widening the scope of the database, familial searching presents a number of additional concerns in the context of investigations, e.g. biological relationships that were previously unknown to the people concerned could be revealed in the course of an investigation. Also, investigations could flounder for the same reason, e.g. questioning an individual about a biological relative who is unknown to them.
- 5.13 **DNA phenotyping** – More controversial still is the variety of uses that may be made of coding the sections of DNA found at crime scenes, which determine the production of proteins in the body that may result in observable variations between people. Inferring observable (phenotypic) characteristics from DNA sequences should be approached with caution: although observable traits such as hair and eye colour show a high degree of genetic determinism, many traits are highly complex, either involving many genes or resulting from interactions between genes and the environment. A particularly controversial area is the attempt to infer racial characteristics, such as skin pigmentation, from genetic sequence data. This has been criticised not only because phenotypes are highly variable, but also because it appears to reduce racial identity to an essential genetic sequence, whereas there may be a great variation in genotype among those who identify with a particular racial or ethnic group. It may also encourage the recording of ever more intrusive information from arrestees, or cross-referencing with other databases – such as a passport or national identity database – where such information is recorded.

- 5.14 As well as problems with its acceptability and its reliability, another difficulty limits the value of DNA phenotyping, namely that, for most genetically conditioned observable traits (eye colour etc.), they and their combinations are sufficiently common within the general population not to be helpful as a way of identifying a suspect without any additional information. On the other hand, if there is sufficient non-DNA information to suspect a particular individual, that person's DNA could, in principle, almost always be obtained for elimination or inclusion in the inquiry. Furthermore, an incorrect inference from genotype to phenotype can mislead an investigation, for example if all resources are concentrated on looking for a suspect with blonde hair when the offender in fact has brown (or grey or dyed) hair.
- 5.15 We can envisage other inferences from coding DNA sequences that would assist police inquiries. The most powerful is to identify genetic traits that may be recorded on other databases: as databases containing genetic information for healthcare, biomedical research, consumer genetic health risk prediction, even genealogy, grow, these provide an ever-increasing pool of information to which a DNA sample from a crime scene may be matched. For sufficiently serious cases where a crime scene sample led to the putative offender being identified as having a medical condition or a predisposition to a certain medical condition, one strategy could be to identify records of people attending clinics for that condition (although for this to be successful the suspect would have to be aware of the condition and be receiving treatment already).
- 5.16 We believe that genetic testing in general is likely to prove increasingly useful and become increasingly common for a wide variety of purposes. These purposes already include: diagnostics, pharmacogenetics, genetic risk prediction, lifestyle guidance and nutrigenomics, biomedical research, relatedness testing, ancestry testing and genetic genealogy. No matter how rapid and inexpensive genetic testing becomes, there are likely to be good reasons for the results of each test to be retained rather than destroyed after a single use. It is not hard to foresee a time when most people will have some – and some people, all – of their genome sequenced.¹³ This information will undoubtedly be held electronically, often in a format capable of being linked to personally identifying information. When this is the case, the question of police access to this information becomes highly pertinent. Although the targets of gene sequencing will initially be coding sequences that are not as hypervariable as microsatellites currently used for forensic profiling, combinations of increasing numbers of single nucleotide polymorphisms (SNPs) will be increasingly rare in proportion to the number of independently assorting variables and the range of variation of each. If a crime scene sample can be sequenced in this way (i.e. in the same way as a sample collected for analysis for medical purposes), this is likely to provide a good reason for the police to want to have access to information from medical records, or other records, such as those held by companies providing direct-to-consumer genetic tests.

(The police are currently able to access medical records as a result of an order from a court, although it is understood that these powers are rarely sought, and only in the most serious cases.)

- 5.17 We have concerns about enabling unrestricted police access to medical or other databases, as this could deter people from accessing medical treatment, or from participating in important research projects. However, such access may not even be required. There are documented cases of donor-conceived people (whose parents used donated sperm in order to overcome male infertility) tracing the anonymous sperm donor by using genealogical websites giving information about families whose male members inherited a characteristic short tandem repeat on the Y chromosome, to then identify a common surname and combine this with information from high school yearbooks in order to identify a person of the right age with that surname in the catchment area of a sperm donation clinic at the appropriate time. A similar approach could conceivably yield a suspect for a determined police investigator, and as resources of this kind become increasingly available online, such research may prove easier to undertake. While unlikely to become an efficient investigative strategy, this nevertheless highlights both the opportunities presented by the growing availability of information in the public domain and the corresponding challenges this presents to individual privacy.

‘Function creep’ and ‘function leap’

‘Function creep’

- 5.18 So far in this chapter we have suggested a number of ways in which the value and/or effectiveness of the NDNAD in contributing to investigating and solving crimes may, in future, be increased, and we have indicated some concerns that relate to these developments. However, in addition to the purpose of investigating and solving crimes, the database represents an extremely rich resource that could be of value for a wide variety of additional purposes. The phenomenon of ‘function creep’ (sometimes called ‘mission creep’) is now in relatively common usage. It generally refers to the progressive expansion of the purposes for which a given technology or process is used beyond those which were originally envisaged or established for it. Function creep is characterised by incremental enlargements of scope, or the addition of new functions, and usually occurs where there is a benefit to be gained by those using the technology or process in those new ways. In cases of function creep, the expansion of use is often possible because of a lack of clarity in defining or regulating the primary function.
- 5.19 Function creep is often beneficial and has been a means to real progress in many areas of human endeavour. However, where the potential exists for function creep to lead to unwelcome consequences, there is a need for appropriate safeguards. Two safeguards can be applied: the clear and precise definition of the

proper function; and effective regulation of use (the second being ineffective without the first). For most databases containing personal data, data protection principles require, among other things, that the use made of such data is constrained by the purpose for which it was originally collected and that it should not be retained for longer than is necessary for that purpose.¹⁴ However, if the purpose is too vaguely defined, these principles are difficult to apply in practice: as we have already observed, the precise number of functions that may fall within the scope of “purposes related to the prevention or detection of crime, the investigation of an offence, the conduct of a prosecution or the identification of a deceased person or of the person from whom a body part came”¹⁵ is potentially very large. In response to our consultation, the Information Commissioner warned:

“Should there be any moves to try and improve the effectiveness of the NDNAD by widening the purposes for which it could be used beyond the investigation and detection of crime then the Information Commissioner would expect there to be highly persuasive evidence to support such moves.”¹⁶

- 5.20 **Research and development** – The NDNAD is currently used for research and development that is generally connected with improving its integrity and utility as a criminal investigation resource. Research using samples or data recorded on the NDNAD may currently only be carried out subject to approval by the NDNAD Ethics Group (or the NDNAD Strategy Board, prior to the Ethics Group’s establishment), although this is not a statutory requirement and neither body is established in legislation.
- 5.21 There are other research uses that can be envisaged that may also, arguably, fall within the scope of section 64 of the Police and Criminal Evidence Act (PACE) 1984. One is criminological research. A greater understanding of patterns of criminal behaviour is likely to improve the utility of the database (perhaps contributing to an evidence base that would support future inclusion, retention and deletion policies), although it is hard to see why access to DNA profiles per se would be necessary for this purpose, as the information may be held elsewhere in criminal justice records.
- 5.22 Another, highly controversial, form of research about which people have expressed concern is behavioural genetics (and the subdiscipline of ‘criminogenics’). Behavioural genetics seeks to correlate genetic variation with disposition to certain behaviours. From its early days, genetics research has been bedevilled by popular speculation about the discovery of ‘the gene for’ anything from intelligence to sexual orientation, from musical ability to criminality. Almost all but a relatively small number of rare genetic conditions are not determined by a single genetic variation. Most phenotypes are conditioned in highly complex ways, by interactions between a large number of genes and between the genotype and environmental conditions. Hence the degree of ‘heritability’ of behavioural traits, the key

concept of behavioural genetics, is extremely low for most behavioural dispositions. Furthermore, where correlations are claimed, they are usually of a general nature rather than a particular and social nature (e.g. a disposition to risk-taking behaviour rather than to lawlessness specifically). In any case, the influence of such genetic variations is almost always very small in relation to external environmental pressures and their effect is therefore easily diluted. The HGC heard, at an information gathering session on the NDNAD in December 2008, that concerns about genuine scientific interest in carrying out behavioural genetics research in relation to criminality are presently misplaced,¹⁷ and that most researchers in this area – both geneticists and psychiatrists – agree with this assessment. The destruction of biological samples that we have recommended above (chapter four) would provide additional reassurance to those worried about research that might be carried out on the NDNAD, although the possible linking of distinct databases does, as we have observed, potentially reintroduce these concerns.

- 5.23 **Confirming identity** – Aside from research, other collateral uses can be envisaged for the NDNAD that would constitute *prima facie* benefits. We have already described, in chapter two, how the law was relaxed to allow the NDNAD to be searched in order to identify victims in response both to terrorist attacks, such as the attacks on the World Trade Center in New York on 11 September 2001 and on London's transport network on 7 July 2005, and to natural disasters, such as the Asian tsunami on 26 December 2004. We have also described how those 'volunteering' to be recorded on the NDNAD include individuals who believe that they may be at risk of 'honour-based violence' in order that they might be identified as the victims of future offences, as well as those who wish to be excluded from police investigations without further intrusion. The addition of functions like these to the database, while apparently beneficial if carefully controlled, represents a significant step. With a database used solely to identify offenders it is, all other things being equal, in almost everyone's subjective interest *not* to be included. These collateral uses, however, introduce positive reasons to *be* included (for example, to allow relatively speedy confirmation of death for surviving family members if one is killed in a natural disaster). If individuals were persuaded of this benefit and the police were to accept them as 'volunteers', this would essentially turn the NDNAD from a criminal investigation database into a general biometric identity database.¹⁸

'Function leap'

- 5.24 It is possible to envisage collateral uses of the NDNAD that would move it significantly away from its original function by exerting a pull towards a wholly new set of functions. Rather than these functions being additional to the original function, they would supplant it, co-opting the resource to a more urgent or important objective. (The alteration from a police investigation database to a biometric database would be a hypothetical example.) We are conscious of the

way in which biometric information is currently being added to new passports for UK citizens and the Government's commitment to introduce identity cards. As one of our respondents wrote:

“In an ideal world there would be one comprehensive database, everyone would be on it and it would be used by various organisations for the benefit of individuals and society. However...”¹⁹

- 5.25 However, as this respondent was not alone in pointing out, there is currently a deficit of public trust, particularly given the enormous potential for misuse of the information.

Trans-functional integration

- 5.26 Perhaps the greatest likelihood of a universal database coming about would not be through the recruitment of the whole population to a single database or a change in the function of a single comprehensive database – such as NHS health records or passports – to include DNA profiles, but through the networking of many pre-existing databases into a ‘metabase’, not a single collection but a ‘collection of collections’. This prospect came nearer, for a time, when in 2009 the Coroners and Justice Bill²⁰ was introduced with provisions to allow the Secretary of State to make “data sharing orders” that would allow data to be shared between databases, including, as the Bill was drawn, the NDNAD. Owing to the “strength of feeling” against them, including on the part of the Information Commissioner, who described the information sharing provisions as “too wide, and its safeguards relatively weak” the Justice Secretary, Jack Straw, announced in March 2009 that he would seek to have the clauses related to information sharing orders withdrawn from the Bill.²¹ However, in withdrawing the clauses, he made it clear that a new attempt will be made to reach a consensus on introducing a scaled-back version of the orders at an unspecified stage in the future.
- 5.27 It is our belief that, other things being equal, there is an understandable pressure for DNA records, like other electronic records, increasingly to be subject to linking. We have observed this in the case of other human biobanks and genetic research databases and of databases more generally. Our domestic safeguards against this ever-greater integration of data repositories are the Data Protection Act 1998 and specific legislation that constrains the use of particular data sets (such as, in the case of the NDNAD, section 64 of PACE 1984), together with the responsible development of principles, guidance and protocols for data storage, access, sharing and linking. While it is common ground that pursuing the benefits of data sharing must be constrained by individual rights to privacy, it is clear, however, that the positions of the police and the data protection authorities are currently at odds. This was highlighted in a report of the House of Commons Home Affairs Select Committee, *A Surveillance Society?*, published in 2008, which reasserted the principle of minimal data retention for minimal time.²² More forthright

criticisms were expressed in an independent report in 2009, *Database State*, which took a highly critical stance towards the Government's policy on the use of information technology and databases to secure efficiency gains in the delivery of public services. The review that led to this report considered 46 public sector databases and rated the "privacy impact" of the NDNAD, along with nine others, as "red" ("almost certainly illegal under human rights or data protection law and should be scrapped or substantially redesigned."²³) This is perhaps unsurprising as this evaluation was reached in the wake of the *S and Marper* judgment.

Trans-jurisdictional integration

- 5.28 In addition to the pressures for vertical integration, there are also substantial pressures to create the conditions for the horizontal integration of criminal justice databases, and the sharing of information between national jurisdictions. Whereas the exercise of law enforcement powers of European Union (EU) member states are confined within national borders, for the transfer of information relevant to law enforcement these borders are increasingly dissolving. We identify three developments in the 'third pillar' of EU policy (police and judicial co-operation in criminal matters) that have contributed to the cross-border linking of forensic bioinformation: the establishment of a system of co-operation based on a central information system making use of electronic databases; the creation of a presumption and then an obligation in favour of data sharing; and the commitment of the UK and other member states to align with such a system.
- 5.29 The Schengen Information System (SIS)²⁴ is a police database established primarily for the purpose of exchanging information relevant to border security and law enforcement (including lists of suspected offenders, those who should be denied entry to the EU and surveillance targets). Although the UK has not signed up to the Schengen Agreement Application Convention, the Schengen *acquis* allows the UK to participate in the system and to exchange data. A second-generation information system, SIS-II, includes a number of enhancements, notably the storage of additional personal – including biometric – data.²⁵
- 5.30 The 2005 Prüm Treaty, which focused on increasing cross-border co-operation, particularly in combating terrorism, cross-border crime and illegal immigration,²⁶ created for the first time a requirement, rather than merely expressing an intention or expectation, that information for the purposes of law enforcement would be made available by member states to other member states in the EU – the so-called 'availability principle'. It also created an obligation to establish, for certain categories of personal data, an infrastructure that enables other law enforcement authorities to have access to available data. The Prüm Treaty was an initiative of seven EU member states and was subsequently adopted into European law, but the UK is not, at present, a signatory. However, the Council

Framework Decision on the protection of personal data in the field of police and judicial co-operation in criminal matters²⁷ has established the ‘availability principle’ as a governing principle for exchanging data among all EU member states in relation to police and judicial matters. This creates the conditions for a virtual EU-wide database for law enforcement that makes an entry loaded on to any forensic database in any EU country potentially accessible to every police force in the EU. We have significant concerns about this, in particular about the information exchanged regarding UK citizens who have not been convicted of any offence. We are concerned that this decision has been taken without adequate consultation in the UK, and without the requirement for enabling legislation to be debated and enacted by the UK Parliament. These misgivings are shared by the House of Lords European Union Committee:

“The threshold for holding DNA profiles on the United Kingdom DNA database is far lower than in any other Member State, and the proportion of the population on the database correspondingly far higher. The Government should as a matter of urgency examine the implications of DNA exchanges for those on the United Kingdom database.”²⁸

5.31 The Information Commissioner points out that:

“... different countries across Europe have very different standards and thresholds applying to the obtaining and retaining of DNA information for law enforcement purposes, e.g. the NDNAD may well hold information on innocent people or crimes that are not regarded as crimes in other parts of Europe. The Information Commissioner would therefore expect any sharing of information by law enforcement bodies to be carried out in line with the provisions of [the] Prüm Convention, i.e. on a ‘hit-no-hit’ basis using the absolute minimum of personal data in order to ensure that a correct and accurate match is made before any more detailed personal data is shared.”²⁹

5.32 Further cause for concern is given by indications that actually “linking databases is a key item in future thinking in the European Union”.³⁰ In view of the concerns that already exist, **we recommend that robust processes should be developed to control international data sharing and that these should be subject to appropriate monitoring.** For example it is important, before pursuing a potentially intrusive investigation, to know not only that an individual is recorded on a forensic database in another jurisdiction (a ‘hit’) but also the reason for the existence of the record. In conformity with accepted data protection principles, we believe that proper consideration should be given to the level of information required to meet the purpose of exchanging data (which we have already recommended should be clearly set out in framework legislation), so that it is possible to ensure that (and to determine whether) the necessary data, and no more, is being shared or exchanged.

The conditions of ‘function leap’: the social context

- 5.33 When projecting into the future of a given technology, we believe that it is often less important to extrapolate the development of that technology in a linear fashion – faster, cheaper, more portable, etc. as all these things can be taken as givens – than it is to consider in what kind of world the technology will be implemented. It is this context – in other words, the sum total of all other developments and innovations, and our cultural, legislative and other responses to them, interacting with one another – that contains the possibility of dramatically altering (including hijacking) the development of a technology. This possibility requires us to ask whether its greater speed, efficiency, effectiveness or reduced cost make the use of the technology more or less acceptable in these conditions.
- 5.34 We have already, at several points in this report, alluded to our belief that genetic testing will become an increasingly common occurrence in the future. Advances in genomic medicine – such as pharmacogenomics or the development of services offered directly to the consumer, from genetic health risk prediction to ‘genetic genealogy’ – combined with greater capacity to understand and make use of test results through bioinformatics, all persuade us that the amount of genetic information produced, stored and used will continue to increase for the foreseeable future. At present, testing is usually restricted to a specific purpose: an individual may have a genetic test to diagnose a particular health condition, to predict their response to a particular drug or to establish a biological relationship. However, as the technologies become cheaper and as greater numbers of genes become implicated in conditioning definable phenotypes, testing is becoming more broad-based. Currently, the standard direct-to-consumer genetic health service on offer from one of the leading companies tests upwards of 180 SNPs, although a genetic ancestry company claims to test several hundred thousand genetic variations. Furthermore, the companies providing these services generally aim to retain the results for use in research and development, or to provide updated interpretations as research produces more information about the role of individual genetic variations.
- 5.35 We have already considered, in chapter three, the ways in which genetic information may be regarded as different from other kinds of information, requiring it to be treated in some contexts as exceptional. However, as our familiarity with genetics increases there is a possibility that our attitudes towards genetic information may alter. In our own 2005 report, *Profiling the Newborn: a prospective gene technology?*,³¹ we concluded that genetic profiling – that is, the analysis of a person’s entire genome in order to reveal their personal genetic information – would become commercially feasible in less than 20 years, and we estimate now that it is likely to be much sooner. Aside from commercial sequencing, the number of people whose genome information will be widely available is also likely to increase with research projects such as the ‘1000 Genomes’ project (target: 1,200 volunteers)³² and the Personal Genome Project (target: 100,000

volunteers) in the US. Additionally, medical research initiatives such as UK Biobank (target: 500,000 volunteers) and Generation Scotland (currently over 18,500 volunteers in family groups) will undoubtedly encourage the collection of genetic information in order to relate this to lifestyle information and medical records, although personally identifying information will not be accessible to the public.

- 5.36 Trends in social attitudes to developments in human genetics are harder to identify and understand, and thus predict. While it is difficult to be precise about these, some general conclusions are possible. It is clear that the language of genetics is becoming more familiar through its use in everyday contexts, for example there is wider exposure to genetic information through the mainstream media, the public's general understanding of the role of genes is improving and people's expectations are becoming more realistic. Notwithstanding this, we are conscious of the findings of the Citizens' Inquiry that there is a need for more education for both the police and the general public (especially those members of the public who act as jury members in criminal proceedings) about the implications of genetic knowledge and the use of genetic technologies.³³ There is also a need for more education to overcome some of the myths about the use of DNA that are created by media representations of DNA technology.
- 5.37 Furthermore, the way that people think about their individual privacy is responding detectably to the social and historical context. The internet, and related innovations such as online social networking that facilitate the sharing of personal information, affect how individuals construct their identities and where they place their boundaries. We have tried to test the hypothesis that a younger generation, whose identities are to some extent externalised and distributed across a number of media, fears less – and perhaps has less to fear – than the current adult generations, who may have attitudes to 'identity theft' and confidentiality formed in more traditional physical environments. We have received helpful feedback from a set of questions we were invited to set in the 'Dialogue zone' of 'Inside DNA: a genomic revolution', an exhibition about genetics aimed at young people.³⁴ The comments received so far (many of which have been posted on our website³⁵) show a familiar balance of views informed by concerns about privacy on the one hand and personal security on the other:

"I am all in favour as it could act as a possible deterrent against violent crime. If technology is available we should use it. I don't believe for one minute it would be encroaching on my human rights if my DNA were kept on file."³⁶

"DNA should only be collected if you are convicted of a crime or to eliminate you from an investigation – in which case it should be destroyed once you are no longer a suspect. Collecting everybody's DNA is an affront on their civil liberties."³⁷

“I don’t believe the police should have a DNA database due to the recent loss of personal information by the Government.”³⁸

“What if they started selling off our profiles as another revenue stream like companies sell addresses? Potentially you could get targeted by companies due to your DNA – fat gene get contacted by McDonalds, bad breath gene get a call from strong-mint, abnormal sweat gland gene coupons for lynx. DNA will eventually become big business in one way or another and when money gets involved ethics go out of the window!”³⁹

5.38 Perhaps having a DNA profile will, in time, become as common as having a mobile phone number or email address: inconvenient sometimes, but tolerable because it is perceived as highly useful. What we are unable to tell at present is whether a generation who seem to manage a range of linked identities, constructed locally for specific contexts, are more or less anxious about the prospect of a DNA database that roots them in the physicality and invariability of a biological fact than those who view identity as a singular and precious insight. Nor can we tell whether, where such attitudes exist, if they are likely to alter with age and changing responsibilities or will be carried forward with each generation.

Notes to chapter five

1. “Police target ‘innocent’ youths for arrest in bid to increase DNA samples on database”, *Daily Mail*, 4 June 2009 downloaded on 11 August 2009 from www.dailymail.co.uk/news/article-1190785/Police-target-innocent-youths-arrest-bid-increase-DNA-samples-database.html
2. Consultation response 54 (individual), quoted in chapter one, above.
3. Consultation response 4 (individual).
4. PACE 1984, s.24 (as amended).
5. Consultation response 23 (Liberty).
6. Graph provided by the Home Office at a meeting between HGC Commissioners and Home Office officials, 21 July 2009.
7. Home Office (2004), p.33.
8. National DNA Database Strategy Board (2007).
9. *R. v. Sean Hoey* [2007] NICC 49 (judgment of 20 December 2007).
10. Caddy et al. (2008).
11. Consultation response 17 (Information Commissioner), pp.2–3.
12. See chapter one.
13. We have considered the issues raised by widespread genetic profiling in our 2005 report *Profiling the Newborn: a prospective gene technology?* The technology has already moved ahead of our predictions and the issues now require revisiting, as we recommended they should be.
14. Data Protection Act 1998, Schedule 1.
15. PACE 1984, s.64 (as amended).
16. Consultation response 17 (Information Commissioner).
17. Presentation to the HGC information gathering meeting by Dr Marianne Van den Bree, 9 December 2008.
18. One could also envisage, more distantly, NDNAD records providing a resource for future genealogists, as prison records do today. The National Archives website draws attention to the availability and usefulness of prison records for genealogists. See www.nationalarchives.gov.uk/familyhistory/guide/ancestorslaw/prisoners.htm
19. Consultation response 15 (individual).
20. See: <http://services.parliament.uk/bills/2008-09/coronersandjustice.html>. For a critique of the draft Bill as enabling “a DNA Database by stealth”, see: www.genewatch.org/sub-563487

21. Information Commissioner, 'Coroners and Justice Bill: Information Commissioner's commentary on the Data Protection Clauses (151 – 154 & Sch.18)', 13 February 2009: available from www.ico.gov.uk/about_us/news_and_views/current_topics/cj_bill.aspx (downloaded 17 August 2009). In the Information Commissioner's view: "The provisions should only apply in precisely defined circumstances where there is a legal barrier to information sharing that would be in the public interest. The Bill needs an additional safeguard, to prevent the use of information-sharing orders in the context of large-scale data sharing initiatives that would constitute significant changes to public policy." *Ibid.*
22. House of Commons Home Affairs Select Committee (2008).
23. Anderson et al. (2009), p.5.
24. This was created by the Schengen Agreement of 14 June 1985, [Convention of 19 June 1990] [2000] O.J. L239 at p.19 (22 September 2000).
25. House of Lords European Union Committee (2007a), para.57ff: "As between the SIS and SIS II, the main development as regards the categories of data to be stored in the system is the addition of biometric data, in particular fingerprint and photographic data, but probably also in due course DNA profiles and retina scans." The Committee was concerned about the risk of misidentification using 'one-to-many' speculative searches.
26. EU Council (Document 10900/05).
27. *Commission proposal: Framework Decision on the exchange of information under the principle of availability* [2005] O.J. C53 at p.1.
28. House of Lords European Union Committee (2007b).
29. Consultation response 17 (Information Commissioner), p.5.
30. 'Common position of the European Data Protection Authorities on the use of the concept of availability in law enforcement' (11 May 2007), Annex to consultation response 17 (Information Commissioner).
31. HGC (2005).
32. The '1000 Genomes' project is an international research consortium supported by the Wellcome Trust Sanger Institute in the UK, the Beijing Genomics Institute Shenzhen in China and the National Human Genome Research Institute in the US.
33. Citizens' Inquiry participants (2008), pp. 17–18 (recommendations 1 and 2), 25 (recommendation 11) and 29 (recommendations 16 and 17).
34. 'Inside DNA' is a five-year touring exhibition that was launched in December 2007. Its focus is to engage young people (14+) with issues in current and future UK-based human molecular genetics and genomics research and their implementation and innovation. At the outset the exhibition aimed to engage more than a million people on its five-year tour.
35. See: www.hgc.gov.uk/Client/news_item.asp?NewsId=100. Numerically, while 53% (of 525 visitors who commented on this issue) between December 2007 and June 2009 said that the police database should include only those who have been convicted, 44% (of 505) thought that everyone's DNA should be held, even though 52% (of 489) said that they did not trust the police to keep their profile information private and 90% (of 472) said that we need a law that covers the use of profile information.
36. Female, age unknown.
37. Male, 16–18.
38. Male, age unknown.
39. Male, 19–24.

Chapter six

Limiting harms: governance and accountability

Introduction

6.1 In this final chapter we examine how the database may be deployed to secure benefits while minimising the risk of harm. We recognise that we are not starting with a clean slate: the database has been established for 15 years and many valuable advances in technology, governance and understanding have occurred during that time. We are conscious of the importance of retaining these advances. However, we believe that we have now reached a crossroads, with the maturity of our national database and the challenge laid down by the European Court of Human Rights persuading us that a major review is due. This chapter contains the majority of our recommendations about how the database should be maintained, managed and used. We make these recommendations with a horizon of ten years in mind; beyond this, if not before, we believe that it will be important to take stock again of the concerns that attach to the database. Our deliberations in this chapter are grouped under four headings: ‘The need for a national debate’, ‘Information, education and public trust’, ‘Attitudes to the National DNA Database’ and, finally, the most substantial section reflecting fundamental concerns, ‘Governance’.

The need for a national debate

6.2 While there has been debate and consultation on National DNA Database (NDNAD) policy, such as the Home Office’s recent consultation on *Keeping the right people on the DNA Database: Science and public protection*,¹ and this has been (latterly) covered in the media, these initiatives have been restricted to addressing specific issues, such as alterations to retention periods. The fundamental questions of public interest, such as how interests in individual privacy and criminal justice should be balanced, have never been subjected to widespread critique. This is not surprising given that the legislation has developed in a piecemeal way, largely through successive sets of regulations that amend section 64 of the Police and Criminal Evidence Act (PACE) 1984. However, it is on these fundamental questions about the relationship between the citizen, society and the state – in other words, questions about the kind of society in which we wish to live – that it is most vital that the public voice is heard. Therefore, **we recommend that the Government supports continuing national debate, informed by the publication of relevant evidence, that addresses explicitly the extent of and justification for the interference with personal privacy inherent in retaining personal DNA profiles. The debate should address the basis on which a distinction may be made among unconvicted individuals so that the collection and retention of DNA profiles of some of them, but not all, would be acceptable.** Furthermore, notwithstanding any immediate measures introduced to secure compliance with the judgment of the European Court of Human Rights in the case of *S and Marper v. the United Kingdom*, **we recommend the establishment of a Royal Commission on the National DNA Database to give focus to, and to learn from, the public debate, and to ensure that its outcomes will be taken forward.**

- 6.3 There are pragmatic as well as principled reasons to encourage public debate. One is the opportunity it affords to obtain insights into alternative perspectives, to gather relevant information that may otherwise be overlooked and to increase understanding of the implications of a range of different measures for different groups of citizens. Another is to foster genuine public trust and confidence in the criminal justice system: claims are frequently made for the level of public support for the NDNAD, often backed up by the findings of opinion polls. However, when these take place without access to reliable evidence and exposure to the full range of arguments, they risk doing little more than providing an outlet for generalised and unexamined attitudes towards crime and civil liberties. The Information Commissioner articulates this succinctly when he says:

“The NDNAD has developed to its present size and level on a somewhat random basis without any specific statutory basis to underpin it. Many of the current data protection related issues, such as the indefinite retention of personal data and difficulties with the process of getting the police to agree to delete records, have developed piecemeal without meaningful public debate. If public perception is that the value of the NDNAD as a crime detection tool is being overstated to justify certain reductions in personal freedoms, e.g. retention of information on innocent people, then there has to be a significant risk that this will result in a loss of public support and co-operation. In the Information Commissioner’s view until such issues are publicly debated and resolved and the NDNAD is put on a proper statutory footing and controlled independently any further expansion of the database could undermine its real value in terms of continued public support.”²²

- 6.4 We are therefore grateful for the encouragement that the Government has given to the Human Genetics Commission and other bodies to move this debate forward. It appears to us, from responses to our consultation, participation in our Citizens’ Inquiry, feedback from the ‘Inside DNA dialogue zone’, meetings with our Consultative Panel and other public events, conferences and workshops, that there is an appetite for debate and a growing understanding of the issues that surround the NDNAD in the UK.

Information, education and public trust

- 6.5 A condition of public support and informed debate is that there should be sufficient, reliable information available. Openness (access to information) and transparency with regard to how the information is produced, as well as the amenability of information to non-specialist understanding and appropriate support for the public’s ability to understand and interpret the information, are all important. Despite their divisions on the majority of issues, one thing that all the participants in our Citizens’ Inquiry agreed upon was that there is a need for public education about DNA and the database. They went so far as to recommend a public awareness campaign on the subject,

as well as specific information for those from whom DNA is taken. It was clear from the Citizens' Inquiry that the participants quickly recognised their own knowledge needs and found the process of informing themselves about the NDNAD rewarding:

“We believe that public education is of primary importance. Lack of information can lead to a great deal of misinformation and a lack of trust. We recommend the general public should be provided with accessible educational information on the National DNA Database so that they are able to make informed decisions. Widespread and detailed information in the public arena will mean the public do not just rely on misconstrued information from other sources. It will also promote trust in the agencies associated with the DNA database.”³

- 6.6 There is some indication from other studies of the forensic use of DNA that this will require a change of approach, for instance:

“Work in the field of public understanding of science has shown that in the domain of the life sciences, proponents of scientific advance have long sought to overcome the ‘knowledge deficit’ and resistance on the side of ‘non-experts’ by ‘educating’ them ... Our study indicates that the opposite is the case in the realm of criminal investigation: people in law enforcement authorities often state that the less ‘the public’ knows about police work at the crime scene, the better ...”⁴

- 6.7 There may be operationally valid reasons for this state of affairs: one concern about providing information about the state of forensic science is that it may contribute to changes in criminal practice and the development of the ‘expert criminal’. Concerns that policing practice can obscure the motives for arrest were expressed during our Citizens' Inquiry. This led to a number of conclusions about what additional efforts the police should make, such as the majority conclusions that “all police officers, as part of initial training, should be extensively trained and educated on policies concerning the NDNAD and should relay the information to those it affects” and “that there should be an independent agency to regulate and monitor the procedures of collecting DNA [and] specially trained police officers should take the sample”.⁵ Although the participants did acknowledge that it was important that samples could be taken by force if necessary, they stressed that all reasonable efforts should be made to explain the process and implications to people from whom samples were obtained. We believe that consideration should be given to improving knowledge of DNA technologies in the training of all police officers and to ways of providing useful information about DNA and the NDNAD to those from whom samples are taken. More generally, **we recommend that more, and more reliable, information about the National DNA Database is made widely available, in particular evidence of its usefulness in investigating crime and leading to the conviction of offenders.**

Attitudes to the National DNA Database

- 6.8 We believe that attitudes towards the NDNAD are often finely balanced and subtly nuanced. In consequence, the presentation of a previously unconsidered perspective, or the discovery of a different sort of evidence, may alter the outcome of any debate. The Citizens' Inquiry is a good example of this – in relation to the issues they addressed, and after considerable debate and weighing of evidence, almost all the conclusions were divided between a majority and an opposing minority view. What we have learned from deliberative exercises of this sort is that when people are enabled to apply their values to questions about the NDNAD in the light of good-quality information, the outcome is often a confirmation, but almost always a qualification, of their initial position, and this qualification often comes about as a result of insights into the perspectives of others.⁶
- 6.9 We have been able tentatively to identify a set of consistent perspectives from which people approach the main issues raised by the NDNAD, or sets of values that inform their arguments. We have distinguished five of these 'ideal types', which we have called: forensic utilitarians, negative libertarians, securitarians, proportionalists and personalists. We outline the substantive approach of each 'type' below. Although most share common elements to a greater or lesser extent, many of the differences tend, in practice, to be more differences of emphasis rather than essential disagreements about what is at stake. Furthermore, not all individuals or organisations demonstrate an equal measure of consistency in holding to their perspective.

'Forensic utilitarians' privilege the utility of the NDNAD in solving crime as the key determinant of whether or not the database is morally acceptable. For this, they need to have a clear sense of the purpose of the database (e.g. to solve crime and to protect the public) and affirm the absolute legitimacy of this purpose and its primacy over other, individual interests. For forensic utilitarians, at least thoroughgoing ones, the acceptable scope of the database changes according to its utility, so there are implicitly no limits in principle to the interests that may have to be set aside in favour of this. A difficulty that forensic utilitarians face is defining the concept of 'forensic utility' itself (whether it is technical, social etc.) and finding an adequate way to evaluate it in practice.

'Negative libertarians' privilege a personal domain of freedom from state intervention, so that the state would have to show a significant and clear-cut entitlement to interfere with their enjoyment of this freedom. Their position is complicated, however, because as members of a society, they require the state to protect them from others, who have an equal right to express their freedoms. Equality of entitlement is a key concept for negative libertarians. Their primary difficulty therefore contrasts with that of the forensic utilitarians in that, rather than having a changing scope of acceptability that is defined by appeal to

'facts', they have an unchanging criterion of acceptability that they need to find a reasonable way of implementing by an appeal to the rights of others. Negative libertarians tend to embrace the presumption of innocence as indicative of an essential freedom; they tend to assert that any interference with such freedoms must be justified as absolutely necessary in order to protect the interests of others, although (1) what counts as 'necessary' for this purpose is subject to interpretation and (2) they avoid moralising about the value of how another individual may choose to make use of their freedom – hence 'libertarians'.

'Securitarians', in contrast to negative libertarians, appear more willing to make sacrifices of individual liberty in order to secure protection against crime. They tend to show a high level of confidence in and sympathy for the agencies of law enforcement. They differ from the negative libertarians in that they are more willing to argue that entitlement to rights is dependent on good moral behaviour and abdicated by antisocial or offending behaviour. They often distinguish sharply between law-abiding citizens and those 'outside of the law', and may come to regard the NDNAD as circumscribing a delinquent underclass. The principal challenge to this approach is to demonstrate how far it can be maintained consistently with support for civil and moral rights in a tolerant, pluralist society.

'Proportionalists' espouse a managerial approach to crime, in contrast to the actuarial approach of the forensic utilitarians, with whom they are closely aligned. Proportionality and utility are distinct, however: proportionality concerns the justification for interference with the rights of the individual whereas utility is about the value of a certain measure in promoting more or less desirable consequences (e.g. in discouraging, identifying or convicting offenders). The touchstone for proportionalists is therefore not the utility of the database but the potential impacts on society and its members (they tend to be more 'social' in outlook than forensic utilitarians). This allows them, for example, to approve of the retention of profiles of some non-convicted persons (e.g. those arrested for sexual and violent offences) on the grounds that the harm of a future offence of this nature is significantly more grave than that of a different kind of offence.

'Personalists' seek to hold together insights from different perspectives (often the personal, as members of society and potential victims of crime, with the legislative, in promoting the optimum outcome for the whole of society as they perceive it). This group recognises, and may themselves demonstrate, how abstract arguments and scientific evidence can be influenced by people's beliefs and emotions. They can therefore appear to change their position depending on whether their principles or their anxieties, their dispassionate attachment to the wholesale defence of individual rights or their personal concern about the threats that the architecture of rights does nothing to mediate,

are to the fore. They might assert, for example, that inclusion on the NDNAD casts suspicion on those recorded and violates the presumption of innocence, but that an exception should be made for those suspected of serious crimes.

- 6.10 Despite these differences of perspective and emphasis, we can put forward a number of principles that each of these ‘types’ hold in common, although they may prioritise them and resolve conflicts between them in distinctive ways. Chief among these is some formulation of the principle that we set out in our first major report, *Inside Information: Balancing interests in the use of personal genetic data*, namely the principle of respect for persons. The principle of respect for persons is a way of saying that different individuals have their own interests or ‘ends’ that are important to them, and that they are entitled to have and to pursue these ends.
- 6.11 In the present context we take the principle of respect for persons to have four main dimensions. First, respect for the *liberty* of persons means that the protection of citizens from crime is a duty of the state and their rights to the peaceful enjoyment of the freedoms in a civil society should be protected. Second, respect for the *privacy* of persons means that the state may only interfere in the private affairs of individuals when it does so necessarily in order to secure the peaceful enjoyment of the freedoms of others, or subject to their adequately informed and freely given consent, where effective measures are provided for security of information. Third, respect for the *equality* of persons simply as persons (and not for any other quality they may possess or acquire) means that all persons deserve equal respect and they should be treated equitably and without unfair discrimination. Fourth, and finally, respect for the *dignity* of persons means that, in its institutions and practices, the state should recognise that those who have committed an offence are capable of rehabilitation and reform and, once they have discharged the requirements of retributive justice, should be entitled to the full enjoyment of the freedoms enjoyed by others.
- 6.12 Linked to the principle of respect for persons is what we described in *Inside Information* as the concept of ‘genetic solidarity and altruism’. In the context of the NDNAD this concept can appear in arguments that support a weak duty to tolerate or submit to the NDNAD, or even a strong duty (a sort of ‘social contract’) to participate in a population-wide database. What most people agree about, however, is that our moral obligations only exist where the end that the NDNAD pursues is a legitimate one (insofar as it is necessary to guarantee respect for persons) and where the interference with individual freedoms is in proper proportion to the need to achieve that end and the likelihood doing so by those means. This relates to two further concepts that we have found either implicitly or explicitly in the majority of the evidence that we have considered, namely those of proportionality and of forensic utility (which we discussed at some length in chapter four).

- 6.13 The concept of proportionality was fundamental to the approach taken by the Nuffield Council on Bioethics in its report *The forensic use of bioinformation: ethical issues*⁷ and is, indeed, one of the fundamental principles of legal reasoning, including that of the European Court of Human Rights. However, the construction of a principle based on the concept of proportionality needs to be approached carefully. In the first place, it will depend strongly on the value attached to the thing to be avoided. (Is it something that should be avoided ‘at all costs’ or only so long as it can be avoided without major inconvenience?) Different societies and different communities will have different tolerances for crime (and for different types of crime, and different definitions of what is a crime). In the second place, different content can be given to the concept of proportionality, for example (quasi-)objective meaning (‘no more than is *necessary* to ensure the avoidance of the harm’), consensual meaning (‘no more than is *reasonable* to ensure the avoidance of the harm’), judicial meaning (‘as much as X judges appropriate to ensure the avoidance of the harm’), etc.
- 6.14 Insofar as it is possible to identify a key difference between the various responses to the NDNAD that we have discovered, it appears to be between those who believe that the inclusion of the profiles of any unconvicted people on the NDNAD amounts to an intolerable abrogation of the fundamental presumption of innocence at the heart of our criminal law, placing them, without judicial process, on a kind of ‘genetic probation’, and those who believe that sufficient justification can be found, at least in principle, for making distinctions among unconvicted people and including some but not others on the database. The key focal points for the public debate that we have recommended should therefore be on the questions of whether such a distinction can be made at all and, if so, how it can be made, since these questions are fundamental to determining the acceptable scope of the database.

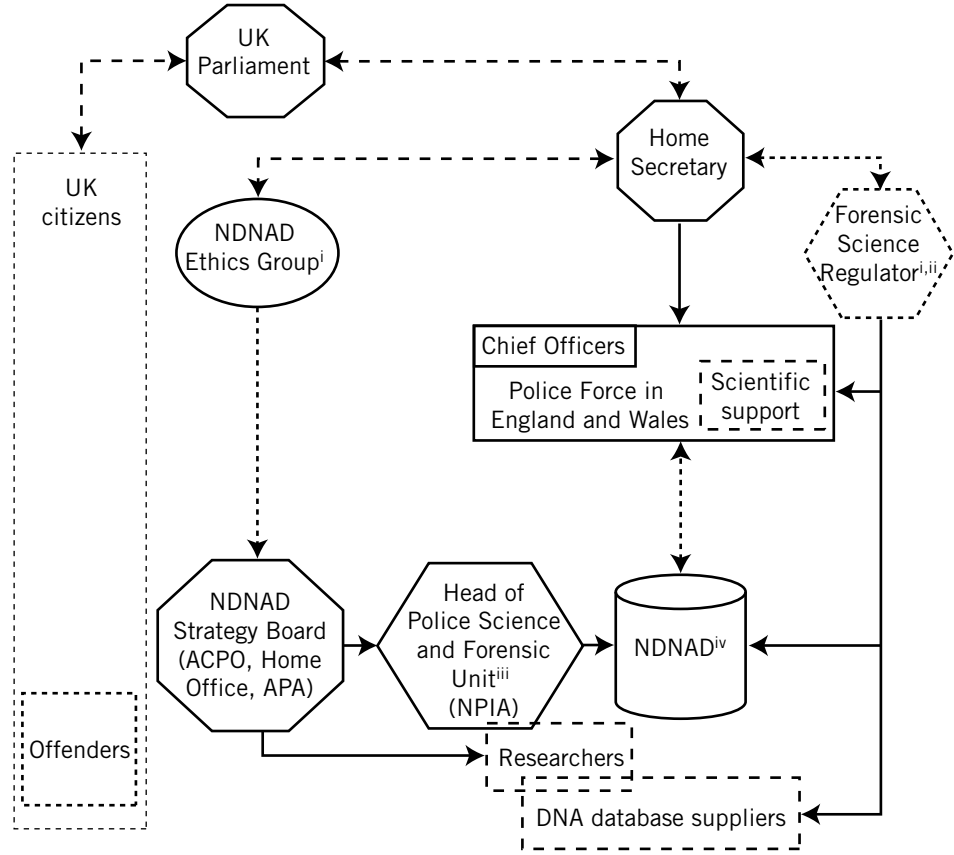
Governance

- 6.15 We do not want to pre-empt the outcome of the public and parliamentary debates that we have recommended should take place on the fundamental issues of principle and the basis and operation of the NDNAD. Pending this debate and anticipated legislation, we recognise that the database is currently operational, and we do not see that there is sufficient reason at present to suspend its use or to cease the practice of obtaining DNA samples from arrestees. Nevertheless, we believe that there are interim benefits to be obtained from improvements to the arrangements for the governance of the NDNAD, including making these more transparent and accountable. Such improvements would be applicable whatever policy emerges regarding the fundamental questions of principle. Informed by what we have heard during our engagements, we therefore make some recommendations below to improve the present situation and to guard against the possible harms that we have identified earlier in our report.

Legislation (Parliament)

- 6.16 It is our position that a database like the NDNAD should be established by new primary legislation and we have made a recommendation to this effect in chapter two. Although the NDNAD is currently controlled by legislation, primarily by section 64 of PACE 1984, the database was not part of the original Bill as debated in Parliament. The provisions relating to the NDNAD were therefore introduced subsequently, via successive pieces of amending legislation. In our view, this does not encourage sufficient focus on the issues raised by the database nor sufficient opportunity for debate, given the gravity of its implications. The most desirable approach would be for the Government to introduce a Bill dedicated to establishing the NDNAD and providing for its use and governance. A debate in Parliament on a new dedicated Bill that is informed by the kind of public debate we have described and a report from a Royal Commission would be most likely to foster public confidence in the process by which the terms of the NDNAD are established, and would provide an opportunity for the full range of concerns to be addressed.
- 6.17 We also believe that the purpose for which the NDNAD is established and the uses to which it may be put should be clearly stated in primary legislation; any provision made for amending those uses through delegated legislation should be limited in scope in the primary legislation. This legislation should be accompanied by full equality and privacy impact assessments as the Equalities and Human Rights Commission and the Information Commissioner have recommended. A fundamental question that should be addressed in the context of this legislation is the limitation of collateral uses of the database that are not connected to the prevention of specific crimes or the conduct of criminal investigations, including, for example, the identification of missing persons.⁸
- 6.18 Furthermore, we have found that descriptions of the existing governance arrangements for the NDNAD to be often obscure and inconsistent and the legislation should both clarify and rectify these.⁹ We offer below a depiction of the existing governance systems, roles and relationships as we understand them.

Current governance arrangements for the National DNA Database



Key

Shape: oval=advisory; octagon=policy/strategy; hexagon=regulatory; rectangle=executive/operational
 Outline: Government/police=unbroken; independent=dotted; commercial=dashed
 Arrows: dotted=advisory; dashed=information; unbroken=regulatory

Notes

- i. Appointed by the Home Secretary on recommendation from the Appointments Commission
- ii. The Regulator covers England and Wales only, although Scottish and Northern Ireland Executives have agreed to adopt his standards
- iii. Formerly the NDNAD Custodian
- iv. The NDNAD holds both crime scene and subject profiles submitted by police forces England, Wales, Scotland and Northern Ireland, and other law enforcement agencies.

Policy and strategy

- 6.19 Responsibility for the development of policy with regard to the NDNAD lies with the Home Office. Strategy is developed by the NDNAD Strategy Board, which produces an annual report. The NDNAD Strategy Board governance is a tripartite structure comprising representatives from the Association of Chief Police Officers, the Home Office and the Association of Police Authorities. This provides accountability to the police service, Parliament and ministers. In addition there are representatives from the Association of Chief Police Officers Scotland, the National Policing Improvement Agency, including the NDNAD Delivery Unit, the NDNAD Ethics Group, the Human Genetics Commission and the Forensic Science Regulator. A representative from the Information Commissioner is also a member in an observer role and the NDNAD Strategy Board can call upon specialists or experts as required to attend meetings. Advice is provided by the independent NDNAD Ethics Group to the NDNAD Strategy Board on matters referred to it by the NDNAD Strategy Board.
- 6.20 Independently of its support of the NDNAD Ethics Group (for which it provides a modest secretariat) and its response to external exigencies (such as the *S and Marper* judgment) there does not appear to be any specific programme of policy development in relation to the NDNAD within the Home Office. This may be because it is treated as connected to PACE 1984. We recognise, in particular, the importance that an assessment of the impact on privacy and the potential for discrimination should be addressed in the context of policy development. In this connection we note that the Home Office has not produced a separate Equality Impact Assessment for its proposals in the consultation *Keeping the right people on the DNA Database*.¹⁰ Furthermore, in our view the assumptions made in the Regulatory Impact Assessment for that consultation are unnecessarily hard to understand.
- 6.21 Considerable efforts have been made by the NDNAD Strategy Board to increase openness (for example, through the publication of redacted minutes on the internet) although we still feel that the length of time taken to publish (currently over a year)¹¹ and level of redaction mean that they remain only of limited value. We are aware that the NDNAD Strategy Board has recently reviewed its own governance arrangements and we are optimistic about the outcome of this review in terms of procedural improvements, in particular in managing conflicts of interest. However, we do not believe that a review of this scope is adequate to address some of our more fundamental concerns about the governance of the NDNAD. Therefore, **we recommend that an independent body be established to oversee the management and use of the National DNA Database, and that this body should conduct its business in an open and transparent way to the fullest extent that the operational sensitivities of policing will allow.**

Data protection and management

- 6.22 The fact that merely holding a DNA profile constitutes an interference with the enjoyment of an individual's right to privacy, as the European Court of Human Rights emphasised in *S and Marper*,¹² serves to highlight the importance of strict data protection around the NDNAD. The fact that certain provisions in the Data Protection Act 1998 may be overridden for purposes of the investigation of crime indicates how seriously the investigation of crime is taken rather than how lightly personal data may be used. We have already described as, in our view, unsatisfactory the arrangements for consideration of applications from individuals to have their records removed from the database. To defend the database from population by arbitrary suspicion, the grounds for removal must at least relate to the grounds for suspicion, and whether these are removed or diminished by the conviction of another person for the offence, for example. Any approach based on simply following precedent encourages conservatism, since to contribute a precedent can be seen as an erosion of the principle of the 'exceptional nature' of the circumstances that justify removal. Therefore **we recommend that clear and explicit rules for the removal of samples/profiles from the database be drawn up so that consideration and, if necessary, argument can be addressed to whether a given case falls under that rule. Consistently with our other recommendations concerning the establishment of the database in law, we recommend that these rules should be stated in primary legislation.**
- 6.23 In the event of refusal of an application to destroy a DNA profile, the individual concerned may then seek judicial review of the decision. Judicial review is, however, more likely to address the entitlement of the Chief Officer to make a decision and the appropriateness of the procedure followed, rather than dealing with the substantive question of the justification for retention. In our view, good governance requires an independent review procedure between the decision of the Chief Officer and the High Court and therefore **we recommend that an independent body be empowered to consider appeals against rejection by a Chief Officer of an application to remove a DNA profile from the National DNA Database.** This would allow proper independent consideration of the merits of the case in relation to clear guidelines and, in many cases, avoid the considerable cost and delay of judicial review proceedings. The appeal body should be independent of the police service, although with necessary access to the information required to reach a decision. The independent oversight body recommended above could fulfil this role. Alternatively, in our view, it could also be fulfilled by the Information Commissioner's Office or another appropriately qualified and constituted body.

Reporting and review

6.24 As the NDNAD Strategy Board annual report confirms:

“The NDNAD was not designed with the requirement to provide the wide range of statistical data and management information now required and it has limited ‘in built’ reporting capabilities ... there have been several changes and additions made to the NDNAD in previous years to increase the ability to be able to provide more consistent data on the NDNAD and to overcome the problem of only being able to take a snapshot of the current position on the NDNAD.”¹³

6.25 As the Home Affairs Select Committee, among others, recommended in its report *A Surveillance Society?*, we agree that an annual report on the state of the surveillance society, including the NDNAD, should be prepared by the Information Commissioner and that the Information Commissioner should be provided with sufficient assistance and information to fulfil this function. Additionally, **we recommend that the National DNA Database should have in-built reporting systems properly designed with the assistance of those with appropriate academic expertise to provide information necessary to demonstrate forensic utility and for equality and privacy impact assessments.**

6.26 **We further recommend that an annual review be undertaken, informed by the reporting systems we have recommended, of the forensic utility of the National DNA Database and that the review should draw out strategic and policy proposals for the management and use of the database.**

Ethical oversight/approval of research

6.27 The NDNAD Ethics Group was established by the Home Office in 2007 as an advisory non-departmental public body, in response to calls for closer scrutiny of the NDNAD. Its remit includes advising the Home Office on the ethical issues of the management, operation and use of the NDNAD, including applications for research involving access to NDNAD samples or data. Members currently dedicate their time voluntarily to the work of the Ethics Group. We are concerned, given the importance of its role, that this group should be sufficiently well resourced. Therefore **we recommend that the National DNA Database Ethics Group be placed on a firmer footing: members should be remunerated (as for the majority of other public bodies), and the secretariat strengthened to support its work. Its independence from the Home Office should also be increased, as should its capacity to review and authorise research applications.**

6.28 We believe that giving effect to the recommendations that we have made in this report, in particular:

- the need to define the purpose of the NDNAD in legislation along with appropriate governance arrangements and safeguards;
- the need for policy makers to engage with the public about the impact of the NDNAD on the relationship between the citizen, society and the state in terms of how guilt, innocence and suspicion are perceived;
- the challenge to adduce evidence and construct argument to demonstrate the acceptability of retaining DNA profiles from unconvicted people and of distinguishing between them so that some are held and others are not; and
- the importance of addressing the implications of disproportionate impact on certain groups

will contribute to an increase in public confidence in policing and the forensic use of DNA information, and provide the practical conditions for its ethical acceptability and responsible development in the future.

Notes to chapter six

1. Home Office (2009).
2. Consultation response 17 (Information Commissioner), pp.4–5.
3. Participants in the HGC Citizens' Inquiry (2008), p.17.
4. Prainsack and Kitzburger (2009), p.73.
5. Participants in the HGC Citizens' Inquiry (2008), pp.25–26.
6. We were pleased that, in its report *Surveillance: Citizens and the State*, the House of Lords Constitution Committee recognised the value of deliberative approaches, expressing itself "impressed by the use of this [Citizens' Inquiry] technique for eliciting informed opinions by citizens and thus helping to shape policies" and recommending that "the Government ... should explore opportunities for applying versions of the Citizens' Inquiry technique to surveillance and data processing initiatives involving databases." The report is available at: www.publications.parliament.uk/pa/ld200809/ldselect/ldconst/18/1802.htm. See paragraphs 430–32.
7. Nuffield Council on Bioethics (2007).
8. We note that the need to consider these has been noted by the NDNAD Strategy Board (minutes of the meeting of 23 June 2008, paragraph 4.1) where it recommends that this issue be referred to the NDNAD Ethics Group.
9. For example, that abstracted by the Nuffield Council on Bioethics (2007, p.96) appears inconsistent with the description of relationships offered by the NDNAD Strategy Board (2007, p.18).
10. We recognise, however, the work that the NPIA, which has custodianship of the NDNAD, has carried out in developing an Equality Impact Assessment for its IMPACT programme to implement recommendations of the Bichard inquiry (NPIA (2009)) and now of the NDNAD.
11. The most recent minutes available on the NPIA website as at 21 August 2009 are from the meeting of 28 June 2008.
12. Judgment, para.67ff.
13. NDNAD Strategy Board (2007), p.19.

Appendices

Appendix 1: Membership and terms of reference of the National DNA Database working group

Terms of reference

The terms of reference for the National DNA Database Working Group were:

- to review the findings of the Citizens' Inquiry, and other evidence collected by the HGC, in the light of HGC's previous discussions of the collection, storage and use of genetic information for forensic purposes;
- to determine need for additional evidence (including public engagement), and to collect and analyse that evidence; and
- to produce recommendations on issues relating to the National DNA Database and Scottish forensic database, and to publish a report.

Membership

- Professor Steve Bain (Chair), Professor of Medicine (diabetes), Swansea University; HGC Observer to NDNAD Strategy Board (2004–08); Member of the NDNAD Ethics Group (from 2007).
- Professor Sarah Cunningham-Burley, Professor of Medical and Family Sociology, Division of Community Health Sciences, and Co-Director at the Centre for Research on Families and Relationships, University of Edinburgh; HGC Observer to NDNAD Strategy Board (from 2006).
- Mr Michael Harrison, Barrister, 2 Temple Gardens.
- Professor John Harris, Sir David Alliance Professor of Bioethics, School of Law, University of Manchester.
- Dr Alice Maynard, Managing Director, Future Inclusion Ltd.
- Dr Lola Oni, Professional Services Manager, Brent Sickle Cell and Thalassaemia Centre.

The NDNAD Working Group first met on 2 May 2008 in anticipation of the delivery of the Citizens' Inquiry report. (The Citizens' Inquiry was developed and overseen by a separate Working Group, the HGC Citizens' Inquiry Working Group, although with some cross-membership. The Citizens' Inquiry working group was disbanded on the completion of the Citizens' Inquiry reports.)

Following publication of the Citizens' Inquiry reports in July 2008 the NDNAD Working Group agreed the main issues for a public consultation lasting from July to November 2008. The group met a further four times (once by teleconference) to consider evidence, including the Citizens' findings and responses to the consultation, and to prepare the final report on behalf of the HGC.

The NDNAD Working Group was disbanded in November 2009 on completion of this report. The report was formally adopted by the HGC on 9 November 2009. Responsibility for continuing dialogue regarding the recommendations contained in this report is delegated to the HGC's Genetics and Identity Monitoring Group.

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Appendix 3:

Glossary of terms and abbreviations

Association of Chief Police Officers (ACPO): a professional body that co-ordinates the direction and development of the police service in England, Wales and Northern Ireland.

Association of Chief Police Officers Scotland (ACPOS): a professional body that co-ordinates the direction and development of the police service in Scotland.

The Association of Police Authorities (APA): an organisation that represents police authorities in England, Wales and Northern Ireland, both locally and nationally.

Criminal justice sample: a sample of DNA obtained compulsorily from people arrested by the police for a recordable offence under the provisions of the Police and Criminal Evidence Act 1984.

Crown Prosecution Service (CPS): the government department responsible for prosecuting criminal cases investigated by the police in England and Wales.

Crime scene stain: biological material recovered from the scene of a crime from which DNA may be able to be extracted.

Deoxyribonucleic acid (DNA): the chemical in the cells of an organism that carries that organism's genome.

DNA sample: a physical sample containing DNA.

DNA profile: a numerical representation of the characteristics of certain sections of non-coding DNA obtained following analysis of a DNA sample.

Low copy number (LCN): a modified form of SGM Plus profiling that is performed when the amount of DNA recovered from a biological sample is very limited. The number of PCR cycles is increased compared to standard SGM Plus, which enhances the sensitivity of the technique and improves the likelihood of detecting DNA.

Match probability: the probability of seeing a DNA profile in the population given that the same profile has already been seen before in the population.

Microsatellite: see Short tandem repeat.

Minisatellites: sections of DNA dispersed within non-coding regions of the human genome that contain thousands of repeats of a short sequence of DNA (7–30 nucleotides).

National DNA Database Strategy Board: board comprising representatives from ACPO, the Home Office and the APA, as well as representatives from other bodies that provides governance and oversight of the NDNAD.

NDNAD: the National DNA Database.

NDNAD Ethics Group: an advisory non-departmental public body set up to provide independent advice on ethical issues concerning the NDNAD to ministers and the NDNAD Strategy Board; one of its functions is to approve applications for research using the NDNAD.

National Policing Improvement Agency (NPIA): a non-departmental public body established to support the delivery of more effective policing and to promote a culture of self-improvement in policing; it provides a central resource to ACPO and police forces, including expertise in areas such as information technology, information sharing and recruitment.

The Police National Computer (PNC): holds extensive data on arrested individuals, vehicles and property. It is accessible from over 120,000 terminals across the country. It contains details of persons from whom DNA samples have been taken.

Polymerase chain reaction (PCR): a technique whereby a specific DNA sequence, within a single piece of DNA, or within just a few copies of DNA, is replicated to produce millions of copies of the same piece of DNA.

Phenotype: the physical manifestation of an individual's genotype combined with the effects of exposure to environmental factors.

Privacy-enhancing technologies (PETs): built-in computer tools, applications and mechanisms that allow users to protect the privacy of personally identifying information provided to, and handled by, online or linked services or applications.

Second-generation multiplex (SGM, SGM Plus): a system of DNA profiling in use in the UK, which examines ten STR markers plus a sex marker to produce a numerical DNA profile that can be loaded onto the National DNA Database. At each of the ten areas examined, an individual has two copies of DNA, one each inherited from each of their parents.

Single nucleotide polymorphisms (SNPs): also referred to as SNPs (articulated as 'snips') – a change in a single nucleotide base in a DNA sequence.

Short tandem repeat (STR): sections of DNA dispersed within coding and non-coding regions of the human genome that contain hundreds of repeats of a short sequence of DNA (2–6 nucleotides). Otherwise known as microsatellites.

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