

ESRC Genomics Network Workstream: Genomics and Identity Politics

Genetic Suspects: Emerging Forensic Uses of Genomic Technologies

**ESRC Genomics Policy and Research Forum, The University of
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Summary of workshop proceedings

Introduction

In his introductory remarks, Dr Steve Sturdy, Deputy Director of the ESRC Genomics Policy and Research Forum, explained that the role of the workshop was to encourage dialogue between forensic scientists, policy makers, criminal justice practitioners and social scientists. Rapid developments and changing practices in the field of forensics have important implications for legislators and the criminal justice system, as well as generating interest and concern among the wider public. This workshop brought together individuals working in these fields with the aim of exchanging ideas and developing understanding of the issues arising from the forensic uses of genomic technologies. Additionally, Dr Sturdy wondered whether it might be possible to formulate a collective contribution to the Human Genetics Commission's consultation on the forensic use of genetic information and the National DNA Database. The introduction concluded with Dr Christine Hauskeller (Egenis, University of Exeter) and Dr Richard Tutton (Cesagen, University of Lancaster) providing a brief reminder of the issues raised in the previous two workshops in the Genomics and Identity Politics Workstream.

Session 1: New Genetics, New Suspects

The first paper, "DNA, biolegality, and changing conceptions of suspects", was delivered by Professor Michael Lynch (Cornell University) and Dr Ruth McNally (Cesagen, University of Lancaster). It focused on the way that legislation has both kept pace with and facilitated changes in techniques of sample gathering and data analysis in the UK National DNA Database (NDNAD). In a development of Michel Foucault's biopolitics, Paul Rabinow's biosociality and Nikolas Rose's biocitizenship, Prof Lynch and Dr McNally proposed the concept of biolegality to emphasise the symbiotic relationship between law and technology, whereby developments in one are coordinated with developments in the other in a series of anticipatory adjustments. An example of this symbiotic co-facilitation is the development of PCR-based techniques that allow for the extraction and analysis of DNA from cells found in human saliva. Legislative amendments in 1994 reclassified mouth swabs as 'non-intimate', so permitting sampling without consent from anyone in police detention or custody who had been or was about to be charged with a 'recordable' offense. The increase in the quantity of DNA samples has led in turn to the feasibility of the NDNAD, and further changes to the law have been introduced to allow for permanent storage and the application of analytical techniques to these data. Prof Lynch and Dr McNally conclude by arguing that, as well as capturing the relationship between legislative and technical innovation, the concept of biolegality identifies an epistemic relationship in which the biological 'truthiness' of DNA evidence legitimises exceptional legal procedures.

Commentary on this paper was provided by Tony Lake (former Chief Constable of Lincolnshire and ex-chair of the NDNAD). Mr Lake emphasised the global nature of the issues surrounding the appropriate use of DNA data in criminal justice, and noted that there are international differences in approach. The NDNAD is a valuable asset in the successful detection of crime, and should be celebrated as such. However there are issues regarding the appropriate use of this asset. The collection, storage, use and sharing of DNA data must all be the subject of deliberation. At the international level, a protocol for the formal exchange of DNA bio-data between G8 countries has been developed. In these deliberations the rights of suspects must be weighed against the rights of victims, and Mr Lake identifies 'hawks' and 'doves' in this debate. For example in the U.S. the right to privacy is enshrined in the constitution and the F.B.I. are very circumspect in their use of DNA data. Similarly the Association of Chief Police Officers in the U.K. opposes the development of a universal database. On the other wing are included the U.S. state authorities of California and Colorado who support the more widespread collection and use of DNA data. The real issue, for Mr Lake is the retention and use of data from suspects. It is important to independently analyse the data held on suspects and the extent to which it is useful in the identification of offending patterns, effective policing etc.

The discussion started with the observation that many new techniques for the collection and analysis of DNA data are led by developments in practice rather than through theoretical developments. Many techniques that have become routine were developed to meet the demands of individual cases. While such innovations are then subject to legal testing, ethical consideration may be overlooked as practice becomes routinized. Scientists often attempt to fulfil the requirements of the current political agenda while reflection lags behind. Wealth-creating aspects of DNA database technology, although not as overt as in the case of stem cells, are also part of the biolegality relationship. For example the rhetoric of the U.K. attempting to keep up with the U.S. in terms of technological advances may influence the drive to push forward practices. The discussion concluded with reflections on the efficacy of DNA data on improving conviction rates, with its impact on guilty pleas and a comparison with the utility of fingerprinting both raised as questions worthy of further research.

The second paper in this session was delivered by Professor Jim Fraser (University of Strathclyde) and was titled "The acquisition, retention and use of forensic DNA data in Scotland". Prof Fraser outlined his recommendations for a review of the legislation governing police powers in Scotland for the acquisition, retention and use of data from those suspected of serious offences. Among the questions to be addressed was: "Is it legitimate to keep the data in cases of suspects involved in criminal proceeding, but not convicted of a crime?" Another key area of concern was the use of DNA data from juvenile offenders. Some of the recommendations were:

- A review of DNA governance structures. There are currently problems of accountability and transparency, with data being used by various agencies but no information in the public realm about how these data are being used.
- Legislation concerning the use of DNA data should be brought into line with that concerning the use of fingerprint data.
- Maintenance of the 3 year limit on the retention of DNA samples and data from those charged with, but not convicted of, serious violent or sexual offences.
- Retention of DNA samples and data from juveniles who were accepted that they had committed or were found to have committed a sexual or violent offence including a serious assault.

Further issues raised by Prof Fraser included the tendency for assaults to be classified in the "serious" category regardless of the seriousness of the assault. He also observed that the response to requests for input into his inquiry from stakeholder organisations was much lower than the level of response to the recommendations themselves.

The commentator was Dr Doug Pearston, Manager of the Scottish DNA database (Scottish Police Services Authority Forensic Services). Dr Pearston welcomed the recommendations and thanked Prof Fraser for his valuable contribution to the review. After a brief review of profile numbers and procedures for

data handling in the database, he made a number of observations concerning current practices and how these might be improved. His first observation was that while the Scottish DNA database is subject to the same rigorous auditing system as the UK database, there is nonetheless a lack of transparency in how this data is used by independent agencies. Dr Pearston agreed that it would be helpful to have more information in this area. Secondly, since Prof Fraser's report appeared, the conviction rate from samples obtained in cases without a conviction has increased, and Dr Pearston argued that sampling of this nature was beginning to show value. Dr Pearston questioned the recommendation that collection of DNA from juveniles found to have committed an assault should be restricted to "serious" cases, and argued that, because of the danger of escalation of offending among this group, the police might wish to keep samples from less serious violent juvenile offenders.

The discussion began with a consideration of the relationship between fingerprint and DNA evidence. While the criminal justice functions of these two forms of data are very similar, there may be differences that require special treatment of DNA samples. The mystique (truthiness) of DNA data and the fear (amongst suspects and those convicted of crimes) that DNA evidence is easier to plant were both suggested as reasons for treating these two forms of data differently. However it was observed that worries about planting evidence and the idea that that evidence was of a special kind had arisen in the early years of fingerprinting as well. Another line of discussion revolved around the assumptions upon which the collection and retention of DNA data - and especially data from children and those not convicted of an offence - was based. Currently, it was argued, judgements about what samples should be kept, and for how long, are largely based on prejudice or common sense. Recommendations should instead be made on the basis of information about the ability of such data to predict risk and manage crime. Such information would in turn depend upon systematic data gathering research, but this is not currently being undertaken on any significant scale.

Session 2: Data, trust and suspicion

Prof Ann Rudinow Sætnan (Norwegian University of Science and Technology) presented a talk based on a paper she co-authored with Johanne Yttri Dahl titled "DNA databases, datasharing and forensic function creep". The term function creep is often applied to surveillance technologies and refers to the gradual changes in the use of a technology (usually increases in scope). The case of the forensic uses of DNA databases provides a good example of function creep. Functions that were controversial or even illegal when first introduced become incorporated into normal practice over time. While the gradual expansion of applications of a technology is not necessarily a bad thing, it is often carried out in the absence of moral and legal oversight. Prof Sætnan emphasised the importance of moral panic as a driver of function creep in surveillance technologies. A high-profile murder or perceived threat can lead to regulations governing the use of a particular technology being ignored,

which sets up a situation in which the moral ground has shifted. A Calvinist morality appears to be at work such that once a technology has been developed it is seen as wasteful not to put it to work in circumstances which, prior to the development of the technology, it would have been considered problematic. Function creep need not be the result of a conspiracy to subvert democratic freedoms such as the right to privacy, but can be driven by the best of intentions.

Prof Sætnan suggested a number of steps to address problems that may arise from function creep in DNA database technologies. One possible principle might be to attempt to judge each application of a technology as if it were the first – i.e. as if assessing the desirability of developing a new technology to fulfil that specific function, rather than applying an existing technology to a new area. Another approach might be to develop technologies in such a way as to make them resistant to application outside the area for which they were originally designed – for example destroying DNA samples so as to prevent their future use in unforeseen areas. There are, of course, significant practical and technical challenges to such measures. However awareness of the tendency of surveillance technologies to exhibit function creep, and an accompanying reflexivity and transparency in the structures that govern their uses (e.g. ethics committees, control committees), might go some way towards addressing potential problems.

Commentary on this paper was provided by Dr Simon Bramble (Head of Police Science and Forensics at the National Policing Improvement Agency). Dr Bramble began by asking whether ethics is a luxury when considering the use of technologies that can protect the public and detect criminals. Dr Bramble acknowledged that this question was meant to be provocative, but stressed the problems of balancing ethics and public safety. It might be better to describe the development of forensic uses of DNA technology in terms of capability growth rather than function creep. Dr Bramble outlined an example in which the use of a new technique (familial searching) led to the identification of a person later convicted of a rape. A cost-benefit analysis plotting detection rates against the number of innocent people sampled is possible, but deciding at what point the rights of the innocent to their privacy is outweighed by the rights of the victim is a difficult question.

With regard to the oversight of new functions arising out of the NDNAD, Dr Bramble emphasised the existence of an independent regulator, three separate select committees and an Ethics Group that amount to elements of Prof Sætnan's recommendations. What is important in this oversight is to ensure that there is an evidence-based scientific perspective on quality standards as well as ethical and legislative safeguards.

Discussion began with questions about the difficulty of identifying new functions, since such identification is a precondition if novel applications of DNA technology are to be assessed according to Prof Sætnan's recommendations. For example, should expansion of the NDAND be regarded as function creep? In the case of illegal applications of a technology, this might be better regarded as function violation rather than function creep. The lack of sanctions against violators and the

subsequent incorporation of these previously illegal applications suggest that problems of transparency and lack of legal and ethical oversight over new functions are problems even where new applications are unproblematically illegitimate. Possible mechanisms for mitigating the problems associated with function creep include greater transparency of organisations charged with applying DNA forensic technologies and more evidence-based evaluation of the utility of new functions. The latter mechanism is dependent on having better quality data on the forensic use of DNA data, and it was suggested that this sort of data gathering should be part of the normal functioning of organisations applying these technologies, as well as part of an external regulatory structure. It was suggested that common/case law systems might be particularly prone to legitimise function creep as they work on the basis of precedent. In addition, pressures on law enforcement agents to secure results can encourage them to continually push back the boundaries of what is acceptable.

The second paper in Session 2 was delivered by Dr Paul McCarthy (Cesagen, University of Lancaster) and was titled, "Privacy-enhancing technologies, 'protecting my DNA/identity'? Building trusted citizens and citizen's trust". Dr McCarthy reported on some of the issues that arose at a focus group meeting organised by Cesagen as part of the Homeland Identification and Technology Ethics project. The focus group explored ethical issues arising from the use of privacy-enhancing technologies (PETs), in order to develop a balanced appraisal of PETs for policy makers as well as the general public. Issues of privacy have been raised as a serious concern arising from the increasing use of DNA and other biometric data in the security and crime detection fields. Building public trust in the data gathering framework, in the face of worries of state surveillance and intrusiveness, might be facilitated by the development of technologies that restrict access to this data. Issues of privacy, autonomy and social justice were addressed in the evaluation of two broad types of PETs: front-end and back-end technologies. Front-end technologies, visible and accessible to consumers/citizens, may increase autonomy, but may be problematic from a social justice perspective as people without access to technology or are less "savvy" will not benefit from these kinds of PETs. Back-end technologies might address the social justice problems by building safeguards into the structure of the technology, but it is questionable whether this approach enhances autonomy. Dr McCarthy noted that issues of trust have tended to arise when data from citizens (defined in contrast to some "other", e.g. criminals or "non-citizens") was included on the NDNAD, and when biometric data was becoming more widely used in the surveillance of citizens.

Commentary on this paper was provided by Prof Helena Machado (University of Minho, Portugal). Prof Machado focused on three main arguments. The first concerned the promised utility of PETs, which was framed within a political design based on social management through technology. This framework was the same as drove the development of the surveillance technologies that PETs are designed to operate in, and has been undermined in the minds of the public by a number of

“technological failures” including recent incidents of data “losses”. Prof Machado’s second argument is that we are witnessing a move towards a new emphasis on individual responsibility through prevention and self-management of threats. This is reflected in the emphasis on front-end PETs and the idea that citizens will be able to protect their privacy through the use of these technologies. Such measures presume that citizens are motivated to assume individual responsibility in ensuring the security of their own data. This leads to a third point regarding the hierarchisation of access to technology and to deliberations around its use. It would appear that the distinction between trusted citizens and “others” is being replaced by a new distinction between those who are the technologically equipped and learned citizens and those who are not.

A lively discussion began by exploring the differences between back-end and front-end PETs. The different ethical and social implications of these approaches to privacy technology were discussed. As well as the trade-off between promotion of autonomy and tendencies towards hierarchisation of access associated with front-end PETs, further problems common to both approaches to PETs were identified. If technological solutions are to be devised for legal requirements, the “fuzzy” demands of legislators will need to be translated into precise rules that characterise digital technologies. This may not always be easy as exceptions are tricky to programme. A connected issue is that the people who devise PETs are rarely the same as those who devise the legal norms to which the technology is to comply, so may not capture all the legal subtleties. With regard to back-end PETs, it is not clear that a technology that is not readily comprehensible (for example the encrypting of data) can restore public trust. Given such problems, it is therefore likely that an over-emphasis on technological solutions will be ineffective in addressing issues of trust.

Session 3: Suspect Subjectivities

Dr Mairi Levitt’s (University of Lancaster) paper “Catching them young? Children and DNA data” drew on her interviews with parents, children and people working with young offenders, to explore what being on the National DNA Database might mean for young people. The placing of children’s data on the NDNAD is controversial, but is commonly justified on the grounds that the likelihood of adult offending is affected by behaviour in childhood. This approach draws on early intervention models that aim to prevent young offenders developing into adult criminals. This rhetoric appears to be modelled on that surrounding medical uses of DNA data, according to which patient choice is enhanced by provision of genetic information. However, the predictive value of DNA data from young offenders is questioned by Dr Levitt. It is “normal” to offend as a youngster, and it is by no means clear that justifications for the retention of this data are evidence-based. Many interviewees were surprised that data gathered as a result of youthful offending was kept permanently and almost all professionals working with young people thought that society is less tolerant than in the past. Attitude surveys

demonstrated that many parents believed that it was “other people’s children”, primarily from lower income groups, that were likely to end up in the database. Dr Levitt expressed worries that there appeared to be moves towards a view that certain genetic profiles were more likely to offend and that the predictive use of the NDNAD was helping to consolidate the view that behaviour was predetermined. The multi-factorial understanding of determinants of health outcomes does not always seem to be reflected in the rhetoric of the predictive value of DNA data in the criminal justice field. There are also issues of discrimination regarding particular social groups that are likely to be disproportionately represented on the database.

Prof Jim Stevenson (University of Southampton) responded to the issue of the predictive value of DNA data in criminal investigations. The nature/nurture dichotomy is misleading. The important question is how genetic and environmental factors interact in generating variation in behaviours between individuals. While we are not dealing with a “natural” phenomenon (as we might be with, for example, a genetic disease), this does not mean that we cannot understand the role of genetic factors in criminality. Studies of the role of genes in behavioural variation have shown that genetic factors do appear to be important in the development of aggressive behaviour. This correlation is not shown in non-violent anti-social behaviour. Studies have demonstrated an interplay of genetic and environmental factors, implying that genes influence a person’s sensitivity to environmental stress, rather than “coding” for a behaviour directly. Also complexes of genes tend to be involved in phenotypic features (including behavioural characteristics), rather than single genes. Consequently, there is no possibility of identifying a gene for aggressive behaviour, and no professional working in this area would suggest otherwise. Prof Stevenson emphasised that predicting adult behaviour purely on the basis of early behaviour was extremely unreliable, but this reliability could be improved with the inclusion of studies incorporating gene-gene and gene-environment interactions. The reliability of these techniques will continue to improve as more is known about these interactions and, while care should be taken not to over-emphasise the importance of this information, we should not discount the utility of these studies.

Discussion focused on the parallels between predictive testing in the medical and criminal fields. It was suggested that pressures to undergo monitoring or even “treatments” might develop. The way people respond to the identification of risk factors is the subject of study in the medical realm and a range of reactions have been demonstrated. It is not clear what this would mean for those identified as “at risk” of criminality; would the response not sometimes be negative? Eugenic implications of medical testing could be echoed in the identification of behavioural genes, with very problematic results. However it was emphasised that the current science identified multiple small effects with variation being common. One cannot isolate small groups as being particularly susceptible to developing criminal behaviour in this way. One point that was raised was that this seems to reflect a

change in our view of risk as it relates to crime. Mitigating risks used to mean locking the door – but might it be coming to mean the control of risky individuals?

The second paper of Session 3 was delivered by Dr Barbara Prainsack (CBAS, King's College, London) and was titled "Criminals in the making: forensic DNA technologies and prisoners' identities". Dr Prainsack's research explored the attitudes of prisoners to the use of DNA forensic technologies. An important finding was that many prisoners were very concerned about their families' safety and welcomed the development of technologies that they believed would help to promote it. There was a strong desire for order among many prisoners, with a surprisingly tendency to see the state as a parent – punishing and protecting in equal measure. In addition there was an understanding that DNA evidence can acquit as well as condemn, so it was welcomed as a means to avoid wrongful conviction. However, there were also recurring worries about the improper use of DNA technologies. A perceived threat of evidence being planted, particularly by their peers rather than by the authorities, was evident. Amongst groups that could be called "professional" criminals there was a view that DNA technology shifts the risk/benefit analysis. The body can always betray you but, while some risks can be controlled (e.g. you can wear gloves to prevent leaving fingerprints), there are particular problems with leaving DNA evidence. DNA evidence was treated as decisive, even to the extent of prompting confessions in cases where the person considered themselves to be innocent. Overall, DNA technology was thought to have shifted the power dynamic between offenders and the state; however this was thought to be a temporary situation lasting only until offenders had mastered the technology.

Dr Pamela Sankar (University of Pennsylvania) welcomed Dr Prainsack's study and argued that it demonstrated the contradictory attitudes held by offenders to DNA technology. Dr Prainsack's quotes had shown that even within one individual the attitudes to the forensic use of DNA could be varied and even contradictory. On the one hand it was thought that DNA technology forced the police to carry out thorough investigations and was an important tool in ensuring that wrongful convictions were prevented. On the other hand the worries around evidence planting were a source of anxiety. Dr Sankar emphasised that the technology is still being created and it can develop in different directions. The history of the development and use of fingerprinting in the early years of the twentieth century might be informative in helping to understand the reception of DNA technology among various groups. One question that was raised concerned the different types of prisoners interviewed and the influence that age, or their attitudes to crime, might have had on their responses. It might be interesting to break down Dr Prainsack's data into finer categories to uncover patterns.

The issue of different groups of offenders and their attitudes to DNA technology was picked up in the wider discussion. For example, if the criminal has no expectation of reoffending does this change their view of being on a DNA database as compared with a "career criminal"? It was suggested that responses to

surveillance technologies (e.g. electronic tagging) might serve as an interesting parallel. It was also observed that prisoners displayed a sense of fairness in their interviews, with the main concern being that DNA evidence might be unfairly planted. The question of methodology was raised and it was suggested that the prisoners were perhaps responding in ways that they thought were “acceptable” to the researcher. Dr Sankar responded that the prisoners seemed, on the contrary, to be rather candid, or even to be projecting an image of non-conformism. Follow-up studies aimed at identifying and correcting possible biases were suggested. The discussion concluded with consideration of the relationship between DNA evidence and patterns of offending. Do criminals alter the kinds of crime they commit on the basis of an assessment of the risks of leaving DNA evidence? It was suggested that patterns of offending are indeed changing as a result of technological developments in forensics, but that political initiatives (for example a campaign against knife-crime) are also influential.

Session 4: Suspicious associations: familial searching and forensic phenotyping

Prof Erica Haimes (Newcastle University) and Prof Robin Williams (University of Durham) presented their paper on “Social and ethical issues in the use of familial searching in forensic investigations”. Familial searching occurs when a DNA profile obtained at a crime scene fails to yield a unique match with a personal profile on the NDNAD. In such cases, a search may instead be conducted to find one or more close partial matches, who may then be brought under investigation on the assumption that they are genetically related to the unknown suspect. This can lead to an exponential increase in the numbers of individuals potentially under investigation. This technique has only been used in a small number of cases so far, but raises a number of socio-ethical issues. Most emphasis has been placed on issues around privacy and the possible reinforcement of views that criminality runs in families. The problems of revealing previously unknown genetic links (or lack of them) between individuals have also been raised. Additionally, Profs Haimes and Williams drew on work in family and kinship studies to raise a number of issues about how relatedness is understood, the relationship between social and biological ideas of relatedness, and the role of genetic information in shaping this understanding. Such issues included the impact of familial searches on families, the idea that persons could act unwittingly as ‘genetic informants’ on their kin, and problems of the conflict between obligations to kin versus obligations to society. These issues suggest that, as well as addressing common concerns about privacy and stigmatisation, the impact of familial searching on family self-identities must also be taken into account. Such issues have important implications for policy development, Profs Haimes and Williams suggested that lessons could be learned from the health field with regard to revealing relatedness/non-relatedness. They noted, however, that this is not a settled issue even among health practitioners.

Comment was provided by Dr Kevin Sullivan, head of Standards and Validation at the Forensic Science Service. Dr Sullivan suggested that familial searching is perhaps an inappropriate term, and that a more accurate alternative might be "genetic relatedness test" or "proximity test". However he suspected that we are stuck with the term "familial searching". He stressed that familial searching was developed in response to an urgent particular need. Legal consideration was given to this development, but ethical consideration has lagged behind. Dr Sullivan stressed the concept of proportionality, which in this case means that familial searching is only considered in serious cases. Other safeguards are in place and the UK has a comprehensive regulatory framework. This is not the case everywhere; for example in the US local regulations range from complete prohibition to a lack of regulation. Dr Sullivan suggested a number of techniques for minimising intrusion, including the filtering of data by sex, age and geographical proximity. The use of paternal lineage (YSTR) testing coupled with appropriate filtering of the data has proved to be a valuable resource in the investigation of crimes. There is scope for improvement in making guidelines more transparent, but the regulatory framework in the UK is largely adequate.

Dr Sullivan kicked off the discussion with the question: "If familial testing was invented today, would we approve its use?" Responses to this challenge varied with both yes and no votes registered. One view put forwards was that there was little difference between being bothered by the police on the basis of witness testimony and being bothered as a result of familial searching. It was noted that familial searching goes against the trend of trying to reduce the chances of people being included in the list of suspects and that efforts to filter the data may introduce biases, based in social factors, which a more general search is not subject to. It was also observed that restricting the technique to cases of serious crime betrayed nervousness about the technology and its uses (as well as begging the question of what constitutes "serious" in criminal terms). It was argued, however, that criminal law has always placed conditions on intrusion based on the severity of the crime being investigated. A theme that arose in discussion was that there very little evidence concerning the impact on families of police investigations, whether driven by familial DNA searches or not. Good governance is dependent on good information, so research is needed into the impact of this technique if legislation is to keep pace with the technology. There is a danger that, in the absence of sufficient understanding of familial searching, the technology will tend to be "spectacularised" by agencies, interest groups and the media.

The final paper of the workshop was delivered by Prof Bert-Jaap Koops (University of Tilburg) and was called "Forensic DNA phenotyping: regulatory issues". Forensic DNA phenotyping is where crime-scene DNA is analyzed to produce a description of the unknown suspect, potentially including external and behavioural features, geographic origin and sometimes even surname. Prof Koops discussed regulatory issues around the use of forensic DNA phenotyping, concentrating mainly

on the Dutch criminal justice system. Issues that have arisen include: the right of people not to know what their DNA tells about propensities to disease or other propensities; data protection and privacy; stigmatization and discrimination; and the "slippery slope" argument. It was argued that many disease and behavioural propensities, especially in cases where these propensities have not (yet) been expressed, should not be revealed as this would infringe the rights outlined above. However for many externally perceptible traits such as hair colour, and for non-sensitive behavioural traits like left-handedness or a propensity to smoke, there did not appear to be such rights-infringement issues. Inferring ethnic origin and surname is also compatible with fundamental rights, provided measures are taken to limit the risk of discrimination. There is a middle group of somewhat but not too sensitive traits, for example indicators of early-apparent medical disorders like albinism or teenage-onset alcoholism, which present particular problems. An important qualification with regard to the use of forensic DNA phenotyping is that it tells one where not to look, rather than providing a description of the suspect.

The response was by Julia Selman-Ayetey who, after mentioning the variation that exists in regulation of forensic DNA phenotyping, stressed the limitations of the approach. While genotypes provide a fixed and determinate marker of identity, phenotypes can only be probabilistically inferred from genotypes. Epigenetic factors must be taken into account and these can have a dramatic effect on how genes are expressed. Identification of suspects by forensic phenotyping depends on probabilistic analysis, which may often be subject to the same kinds of biases that arise in other areas of suspect profiling. Where the technique is most useful is in cases where an amalgam of features is identified, but this tends to reduce the chances of success. Research is needed to compare the utility of forensic DNA profiling with eye-witness reports and other forensic methods with regard to detection and resolution of cases; a cost/benefit analysis is required. It is difficult to draft legislation on the basis of so rudimentary a science. The Dutch regulatory model could serve as a reasonable basis upon which to proceed in the UK but there are still issues to be dealt with and these issues are changing as the science develops.

The discussion picked up on Ms Selman-Ayetey's last point and began by focussing on possible structures for the continual review of the regulation of forensic DNA phenotyping, for example oversight committees. It was suggested that, given the primitive level of the science, the results at present were not likely to be significant; indeed phenotypic profiling is virtually non-existent at present, though this may change in the future. The key issue is how we might combine phenotypic information with other types of data. It was emphasised that geographical origin data was only meaningful in "outlier" cases and in these circumstances there is a real danger of stigmatisation as it will tend to be in populations that are relatively isolated. There is a worry that this technology may tend to mislead rather than inform police investigations if too many assumptions are built into the profiling.

Final Discussion

Dr Sturdy led the final discussion, and reiterated his hope that it would be possible to identify a consensus among some or all of the participants about a set of recommendations which could form the basis of a submission to the Human Genetics Commission consultation on the forensic use of genetic information and to the Scottish Government consultation on Prof Fraser's report on the use of such information in Scotland. The main issue that has recurred throughout the papers and discussions has been the need for more research into the operations of the NDNAD and its utility. This is required to aid transparency and ensure that strategic planning is evidence-based rather than proceeding on the basis of "common-sense" and prejudice. Those present at the final meeting agreed that Dr Sturdy should draft the proposed submissions and circulate them among the participants for comment and agreement where appropriate.

The issue of the changing identity of the suspect was also discussed. Inclusion on the NDNAD has changed what it means to be a suspect, from being suspected of a specific offence to that of being a suspect *simpliciter*. The question was asked: "What is the national database for?" Not all those on the database have been charged with or convicted of a crime, and not all criminals are on the database. In genomic medicine it has been argued that we are all, to some extent, patients. In terms of medical research, being on a database is often seen as a way of helping to improve medical capabilities and provisions; could forensic DNA databases be seen in a similar light? However, inclusion on a medical DNA database is usually voluntary and motivated by a philanthropic desire to help society, while inclusion on a forensic DNA database is in almost all cases compulsory and against the wishes of those included. Perhaps the issue might be better thought of in terms of changing notions of citizenship; we are all risk subjects rather than suspects, while the state is a risk manager in the business of predicting risk. People seem to be happy to endorse the risk-averse state and the technologies that go with it. But this also raised questions about the novelty of the issues thrown up by the NDNAD. The surveillance state has been around for a long time, so perhaps it is simply the mechanisms for surveillance that have changed. As with the development of other surveillance technologies, we should not overlook the role of institutional players. CCTV companies, forensics companies, the state, etc. all have their part to play in the dynamics that drive technological advances.

The session closed with thanks to Margaret Rennex and Clare Mowbray, both of whom were instrumental in the organisation of the workshop.

Participant biographies

Dr Simon Bramble is Head of Police Science and Forensics at the National Policing Improvement Agency.

Lucy Cahill is the Business Benefits Officer for the ACPO Criminal Records Office. The ACPO Criminal Records Office offers advice and guidance to all things relating to criminal records including the taking and retention of biometric data. Previous employment has included working as a Forensic Intelligence Researcher for Hampshire Constabulary.

Sarah Cunningham-Burley is Professor of Medical and Family Sociology based in the Division of Community Health Sciences, Medical School, University of Edinburgh, where she is also co-director of the Centre for Research on Families and Relationships. Her research interests span medical and family sociology and include the social aspects of genetics and stem cell research, as well as research on families, health and illness across the lifecourse. She is also on the Human Genetics Commission. She chairs the monitoring group on research databases and was a member of the working group for the recently completed citizens' inquiry into the forensic use of DNA and the NDNAD. She is also one of two HGC observers on the NDNAD strategy board.

Jonathan Davies is a PhD Student at Egenis, University of Exeter. My first degree is in Philosophy with Politics, followed by a Masters in Philosophy at Liverpool University. I am now completing an AHRC-funded PhD on localised and distributed causal explanations in classical and molecular genetics, genomics and systems biology.

Prof Jim Fraser is Director of the University of Strathclyde's Centre for Forensic Science. He is Chair of the European Academy of Forensic Science, Associate Director of the Scottish Institute for Policing Research and a past President of the Forensic Science Society. He has extensive experience as an expert witness in criminal courts in the UK and has been involved in many high profile cases e.g. Robert Black, Stephen Downing, Michael Stone, Damilola Taylor. Professor Fraser has significant experience in strategic and policy matters in relation to forensic science in the UK and internationally. He has advised a range of agencies on forensic, scientific and investigative matters, including the Association of Chief Police Officers, Her Majesty's Inspector of Constabulary, the Home Office and the Scottish and Westminster Parliaments.

Dr Gill Haddow is currently a research fellow and lecturer based at the ESRC INNOGEN centre at the University of Edinburgh. She has worked mainly in the area of medical sociology, especially research around new scientific and medical

technologies such as organ transplantation and DNA databases. She is currently working on a variety of projects including the regulation of xenotransplantation, the impact of patient interest groups on the democratisation of biomedicine and the governance of population genetic databases.

Erica Haimes is Professor of Sociology at Newcastle University and was the Founding Executive Director of PEALS (Policy, Ethics and Life Sciences) Research Centre, from 1998 to 2008, where she is now Professorial Fellow. She has researched and published on the social, legal and ethical aspects of recent developments in the life sciences, with a particular focus on reproductive and genetic technologies.

Dr Christine Hauskeller is Senior Research Fellow at Egenis, the ESR Centre for Genomics in Society, University of Exeter. She directs and supervises projects studying the life sciences in their epistemological, sociological, and ethical dimensions. Christine studied philosophy and sociology at the University of Frankfurt. Her PhD dissertation in philosophy analysed concepts of the subject in the work of Judith Butler and Michel Foucault. For the past 10 years she has been involved in interdisciplinary projects on stem cell science and genetic/genomic themes. The idea for the workstream on genomics and identity politics emerged from her screening of the themes emerging around genomics in present society. Her Young Scholar Award Paper on this theme can be accessed at:

<http://centres.exeter.ac.uk/egenis/research/documents/HumanGenomicsasIdentityPolitics.pdf>

Dr Christine Knight is Policy Research Fellow at the ESRC Genomics Forum. She is responsible for providing policy engagement support to the ESRC Genomics Network, and running events and activities to promote social research on the contemporary life sciences to policy audiences. Christine's first degree was in English and cultural studies, but she then undertook her PhD in a human nutrition research unit, examining genetic and evolutionary explanations for obesity and diabetes in the low-carbohydrate diet movement. Christine has worked previously in the South Australian public sector, in parliamentary research, and in communications and event management in the voluntary sector.

Prof.dr. Bert-Jaap Koops is professor of regulation & technology of the Tilburg Institute for Law, Technology, and Society (TILT) of Tilburg University, the Netherlands. His main research interests are criminal-law issues in investigation powers, privacy, computer crime, identity-related crime, DNA forensics, and cryptography. He is also interested in identity, digital constitutional rights, 'code as law' and human enhancement. He co-ordinates a research program on law, technology, and shifting power relations. Koops studied mathematics and general and comparative literature and did a PhD in law.

Tony Lake was until recently Chief Constable of Lincolnshire and Chairman of the ACPO Forensic Portfolio. He had a career in policing spanning over 35 years and worked in five police forces, including the Metropolitan Police Service. He also held the position of Chairman of the UK's National DNA Database between 2004-2008 during which time the subject of DNA within a criminal justice context was hardly out of the media spotlight. He helped to set up the international arrangements for the exchange of DNA data between law enforcement agencies. He is a strong supporter of the Database in the fight against crime, but is not in favour of a universal DNA database. He now acts as consultant and advisor to police forces and is a Governor at Bishop Grosseteste University, Lincoln.

Dr Mairi Levitt is head of the philosophy department at Lancaster University and was previously Deputy Director of the ESRC Centre for Economic and Social Aspects of Genomics (Cesagen). She has degrees in religious studies and sociology and has been involved in research and public engagement activities on the 'new' genetics since 1993. Recent funded research projects have been on the topics of children on the National DNA database, 'criminal genes' and children's ideas on human enhancement. She is interested in empirical bioethics and the complementarity of the disciplines of philosophy and social science.

Michael Lynch is a Professor in the Department of Science & Technology Studies at Cornell University. His research is on discourse, visual representation, and practical action in research laboratories, clinical settings, and legal tribunals. His most recent book, *Truth Machine: The Contentious History of DNA Fingerprinting* (University of Chicago Press, co-authored with Simon Cole, Ruth McNally & Kathleen Jordan) examines the interplay between law and science in criminal cases involving DNA evidence. He is Editor of the journal *Social Studies of Science*, and current President of the Society for Social Studies of Science (4S).

Helena Machado is Associate Professor in the Department of Sociology and Deputy Director of the Research Centre for the Social Sciences at the University of Minho, and associate researcher at the Center for Social Studies, University of Coimbra (Portugal). Her research interests are primarily in the fields of forensic genetics, infertility, technology in the courts, and interfaces between the criminal justice system and the mass media. She is currently undertaking research on the social, ethical and political impacts of a DNA database for forensic purposes in Portugal and on the interactions between justice, media and citizens.

Dr Paul McCarthy is Research Council Academic Fellow in Health Care Resources in the Postgenome Era at Cesagen, is based in the University of Lancaster. His research mainly focuses on the impacts of genetics and other technologies/sciences on social policy, and particularly on regulatory and governance issues arising out of

genomics. His three main themes in this regard are enhancement/eugenics; genomics and the concept of bio-economies; and innovative regulatory frameworks dealing with genomics at national, EU and supranational level. More recently he has participated in research into the social impacts of biometric technologies in an EU/UK context.

Ruth McNally is a Senior Research Fellow at the ESRC Centre for Economic and Social Aspects of Genomics (Cesagen), Lancaster University. She has a BSc Hons Genetics, MA Socio-Legal Studies, PhD Science and Technology Studies. She is co-author of Lynch, Cole, McNally and Jordan, *Truth Machine: The Contentious History of DNA Fingerprinting*, forthcoming 2008, and is continuing to develop PROTEE, a science studies tool for the management of radical innovation projects.

Peter Mills currently heads the Secretariat of the Human Genetics Commission (HGC), which is based within the Department of Health. The HGC is the Government's advisory body on developments in human genetics and their ethical, legal, social and economic implications. The HGC has championed openness and the use of public dialogue to inform its advice to Government. One of its recent projects was a Citizens' Inquiry into the forensic use of genetic information (and the National DNA Database) and the Commission is currently engaged in wider public consultation before drawing together a report for ministers, to be completed in 2009. Before moving to the HGC, Peter worked for a number of years for the Human Fertilisation and Embryology Authority (HFEA), where he led a number of major policy reviews including preimplantation genetic diagnosis (PGD), sex selection, preimplantation tissue typing ('saviour siblings'), and sperm, egg and embryo donation. Before joining the HFEA, Peter had a brief career in publishing. In the more distant past, he read PPE at Trinity College, Oxford, and received a Ph.D. in philosophy from the University of Warwick for a thesis examining the problem of epistemic discipline since the Enlightenment, drawing on the work of the contemporary French thinker, Michel Serres.

Claire Nisbet is a DNA Analyst in the Specialist Crime Directorate of the Metropolitan Police Service (MPS). Having obtained a first degree in genetics and molecular biology, Claire went on to study Forensic Science at postgraduate level before working for a key forensic service provider as a DNA scientist. Claire's current role within the MPS largely focuses upon the establishment of a DNA Research and Development laboratory that provides support and advice to specialist operations.

Dr Doug Pearston is Manager of the Scottish DNA Database, part of the Forensic Services Business of the Scottish Police Services Authority (SPSA). After gaining a PhD at Aberdeen University in 1986 he joined Cellmark Diagnostics, the first commercial DNA testing company, as Laboratory Manager. He has been a forensic scientist for over 20 years.

Barbara Prainsack (Dr. phil.) is Senior Lecturer at the Centre for Biomedicine & Society (CBAS) at King's College London. Her research interest lies in the ways in which science, politics, and 'religion' mutually constitute each other, and what effect they have on how we understand ourselves as human beings, bodies, persons, and citizens. Barbara has published on different issues at the interface of genetics and society, such as genetic testing, human cloning, and DNA databases. Together with Richard Hindmarsh she is currently editing a book on *DNA Profiling and Databasing: Governing the Challenges of New Technologies* (Cambridge: Cambridge University Press, forthcoming).

Charles D. Raab is Emeritus Professor of Government and an Honorary Fellow in Politics at the University of Edinburgh. His main research and teaching interests are in public policy and governance, including British government, information policy (privacy protection and public access to information), surveillance, and information technology in democratic politics, government and commerce. He is the Specialist Adviser to the House of Lords Select Committee on the Constitution's Inquiry into 'The Impact of Surveillance and Data Collection upon the Privacy of Citizens and their Relationship with the State' (2007-08).

Ann Rudinow Sætnan is Professor of Sociology at the Norwegian University of Science and Technology. Her research interests include health services research, sociology of gender, and science and technology studies. She was a contributor to the Urbaneye project (<http://www.urbaneye.net/>), a European research project on video surveillance of public spaces. She also contributed a chapter on medical surveillance to the ICO Report on the Surveillance Society (http://www.ico.gov.uk/upload/documents/library/data_protection/practical_applications/surveillance_society_full_report_2006.pdf). She is currently heading the projects For Whom the Bell Curves (<http://www.svt.ntnu.no/iss/projects/bell/index.html>) and Health by Numbers (both financed by the Norwegian Research Council). These projects study the roles of statistics in current society – including statistics as a tool for surveillance and social control, and tensions between the need to be visible and "to count" versus the need to be invisible and not subjected to counting.

Dr. Pamela Sankar is an Associate Professor of Bioethics in the Department of Medical Ethics, a Fellow at the Center for Bioethics, and a Senior Fellow at the Leonard Davis Institute of Health Economics at the University of Pennsylvania. Her graduate training is in anthropology, communications, and health policy. Dr. Sankar's current research focuses on the social, historical, and scientific meanings of race, in particular how scientists working in medical and forensic genetics understand and use race as a research variable. Dr. Sankar has conducted several studies of genetics researchers based on in-depth interviews and content analysis of scientific articles. Several years ago she completed a history of the evolution of state-based

criminal record-keeping in the United States, from the late 1700s through the emergence of fingerprinting. Dr. Sankar is currently director of a three-year project concerning Emerging Ethical Issues in Criminal Forensic Genetics, funded by the National Human Genome Research Institute of the National Institutes of Health.

Julia Selman-Ayetey is a member of the National DNA Database Ethics Group and currently teaches criminal law at King's College London and University College, Oxford. She has contributed to a number of edited books on the forensic use of DNA. Her specific interest is in the legislative framework governing the use of DNA in criminal justice systems and its impact on civil liberties and human rights. Julia has a master's degree in Criminology and has been called to the Bar of England and Wales.

Jim Stevenson is an Emeritus Professor of Psychology at the University of Southampton. His research interests are in developmental psychopathology and paediatric psychology. He has particular expertise in epidemiology and quantitative genetic analysis. His research has concentrated on reading disability and behaviour problems including hyperactivity particularly in young children. For details of publications go to:
<http://www.psychology.soton.ac.uk/people/ShowProfile.php?username=jsteven&source=acres>.

Dr Steve Sturdy is Deputy Director of the ESRC Genomics Policy and Research Forum at the University of Edinburgh. His first degree was in biological sciences, but he has since pursued an academic career in the sociology and history of medical science, with particular interest in its relationship to medical practice and medical policy. Steve's work at the Forum is devoted to promoting interdisciplinary and public debate around the social dimensions of genomic science and technology.

Dr Kevin Sullivan is Head of Standards and Validation at the Forensic Science Service, based in Birmingham, with extensive experience of scientific techniques, establishing standards and other quality-related areas. During his 21 years with the FSS he has participated in the research, development and validation of a wide range of forensic processes especially DNA analysis, spanning from the first ever DNA case to the present day.

Dr Richard Tutton is Senior Lecturer at the ESRC Centre for the Economic and Social Aspects of Genomics (Cesagen) at Lancaster University. For the last ten years I have had an interest in the social and ethical issues of banking human tissue for biomedical research and the implications of developments in science, technology and medicine for cultural and social identity. In 2004, I edited (with Oonagh Corrigan) *Genetic Databases: Socio-ethical Issues in the Collection and Use of DNA* (Routledge).

Robin Williams is Professor Emeritus of Sociology at the University of Durham. He is currently funded by the Wellcome Trust (for a study of forensic DNA databasing across the EU) and by the Nuffield Foundation (for a study of the future of forensic bio-information). He has recently published a book on the history and uses of the NDNAD, and with Jim Fraser is currently editing a *Handbook of Forensic Science* to be published by Willan in 2009.

Prof Steve Yearley is Director of the ESRC Genomics Policy and Research Forum at the University of Edinburgh; he is also Professor of the Sociology of Scientific Knowledge. Starting out in the natural sciences (chemistry and geology), Steve migrated through the philosophy of science to the empirical study of "science in society". Steve is interested in technical and scientific controversies that spill out beyond scientific domains, and is concerned with the way such topics are regulated.