THE FUTURE OF FORENSIC BIOINFORMATION

International Symposium, 29th – 30th July, Oxford University, UK.

Headlines

Note: this document should be read in conjunction with the summary of issues, provisional conclusions and questions identified during the preceding UK seminars circulated prior to the symposium.

Session One

A presentation was given providing a background to the UK seminars and the possible implications of the judgment by the European Court of Human Rights in *S. and Marper v. The United Kingdom* for law and practice relating to the use of forensic bioinformation.

1.1. The three themes of the UK Seminars ('Governance, Integrity and Integration', 'Internationalism & Exchange' and 'Evidence & Assessment') were outlined and discussed

1.2. Participants were reminded of recent developments in European jurisprudence especially relevant to the current meeting.

1.3. All organisers and participants introduced themselves and the agenda and format of the symposium was explained and agreed.

Session Two

Session two outlined key current issues, concerns, research findings and achievements from the viewpoint of those countries and international organisations represented at the symposium.

2.1. ***Sweden:***

2.1.1. There is not a lot of ongoing discussion. Sweden amended their DNA database law in January 2006. Since establishment, the DNA database has increased in size but still remains quite small with 65,000 profiles, (40,000 from convicted people) and 20,000 crime scene stains. It is not growing significantly. The database gets positive matches ('hits') on most stains. The new legislative amendment made it clear there shall be no retention of biological samples (max. 6 months retention for processing though most samples should be destroyed earlier). There has not been a lot of publicity around DNA since the Tsunami / killing of Swedish Foreign Minister Anna Lindh.

2.1.2. The Swedish DNA Database at June 2009 consisted of approx 40,000 convict profiles and approximately 25,000 suspect profiles (this number fluctuates but is fairly stable at this level) and approximately 20,000 crime scene stains (this number is not growing significantly due to the very high number of hits).

2.1.3. Suspects can be sampled when under suspicion of a crime that can render a jail sentence. They remain in the suspect DNA database as long as there is a suspicion. If the investigation against them is stopped or the case results in an acquittal then the profile is to be removed. Convicted persons who receive more than a fine as penalty, have their profiles transferred from the suspect to the convict database. They will remain in the convict DNA database as long as they are in the police convict records (their sentence + 10 years if no new crimes are committed) or can be moved to the police suspicion database for any new offences. One is not transferred from the convict to the suspect database upon new suspicions, then the individual just remains in the convict database.

2.1.4. DNA samples can be required from people other than suspects in crimes serious enough to attract a custodial sentence, where DNA can help solve the crime. This opens up the possibility for intelligence screens. These samples are destroyed upon profiling and the profiles cannot be used beyond the specific case they were taken for.

2.2. ***Netherlands:***

2.2.1. DNA-issues: Suspects can be included in the Dutch DNA database but only if DNA testing is expected to help in solving the case. This means that crime related DNA material must be present for comparison. If a suspect is not convicted, their DNA profile must be removed from the DNA database and their cellular material must be destroyed (unless the DNA-profile has matched another crime related DNA profile in the DNA database). Thus the DNA-legislation in the Netherlands should be 'Marper-proof.' The inclusion of DNA profiles of volunteers is not permitted, (e.g. living victims, witnesses, mass screen participants), with the exception of persons who have been convicted in the past and have indicated by a written consent that they want to be included in the database.

2.2.2. The law which provides for the inclusion of convicted persons in the Dutch DNA database is planned to be fully in force in 2010. Presently, retention of DNA only applies to convicted persons of certain designated serious crimes. When fully enforced, the law will allow retention for convicted persons of all crimes for which preventative custody is allowed. This will result in a threefold increase of convicted persons included in the Dutch DNA database (an increase from 15,000 to 45,000 per year). There is also draft legislation to allow familial searching presently being prepared for discussion in the Dutch parliament.

2.2.3. There have been several instances of lower courts being hesitant to permit the inclusion of juveniles on the DNA database, even when convicted. The law is fairly strict however and allows for only 2 exceptions to inclusion (if DNA has no relevance to the crime or if such very special circumstances that no risk at all of recidivism.) However, the courts were considering the particular rights of children until the Supreme Court said there was to be no exception for juveniles. The European Court of Human Rights (*W. vs the Netherlands*, 20 Jan 2009) has ruled that it is not a breach of the European Convention on Human Rights to put all convicted children in the Netherlands DNA database.

2.2.4. With regard to the Treaty of Prüm/EU-Prüm-Council-Decisions, the Dutch Minister of Justice has informed the Dutch Senate that until further notice, the Netherlands will not provide or ask for information associated with DNA-profiles based on 6 and 7 locus matches because some of these may be false positive matches. These matches must first be confirmed by additional DNA-testing to increase the number of loci involved in the match. The Netherlands had difficulties initially with lots of matches under Prüm exchanges with Germany, so initializing the further testing (to 8 loci as minimum) to check for false matches before information will be shared.

2.2.5. Since 2003, the Netherlands has had a law allowing the determination of personal characteristics from crime-scene DNA ('forensic DNA phenotyping'). Currently, only ethnic origin and gender may be determined; new externally visible characteristics like eye or hair colour can be designated by an Order in Council.

2.2.6. With regard to 'dragnets' or mass screens, the Netherlands has policy guidelines, but no formal law for now relating to their use.

2.2.7. There has been lots of debate in The Netherlands over the use of experts in criminal cases, with high-profile miscarriages of justice recently leading many to think that the entire system must be flawed. There have been some recent changes in laws relating to scientific experts, so that experts can now be entered onto a register.

2.2.8. Fingerprint issues: In July 2009, The Dutch Parliament amended the Passport Act to mandate the inclusion of biometric data (two fingerprints and a facial scan) in travel documents. These fingerprints will be stored in a central database which will also be available for forensic purposes. A public debate has ensued, which at times has been critical of the amendments, arguing that centralised storage was risky and not mandated by European Regulation 2252/2004. Two Dutch civil rights organisations have announced that they will lodge a complaint against the Netherlands with the European Court of Human Rights using the *S. and Marper* decision as an argument to support their case.

2.3. ***Poland***:

2.3.1. There has not been much discussion surrounding bioinformation databases, perhaps because they remain relatively small. The DNA database contains approximately 22,000 subject profiles and 1200 crime stain profiles. The fingerprint database holds more than 3 million individuals and 73,000 crime scene marks. They are operated under the Police Act 1990, with a Central Forensic Laboratory of the Polish Police responsible for running the databases.

2.3.2. The police are obliged to adhere to data protection requirements contained in other acts. The databases use CODIS software and the SGM+ profiling kit. DNA examination is used widely in Poland in minor cases (like simple robberies for example) but in these minor offences, the Police do not include the DNA profiles in databases. DNA is only retained on the database for serious offenders. The policing budget is insufficient for retention of a large number of DNA profiles for every offence.

2.3.3. DNA profiles are removed from the database after 20 or 35 years depending on the original crime severity. Profiles are removed if the person is acquitted or charges dropped. The prosecution gives the order to remove the profile and destroy any

sample. The Police Act was amended in 2007, and waiting another amendment. There are some changes expected, but no firm idea what yet.

2.4. ***Hong Kong***:

2.4.1. Fingerprints: Hong Kong citizens have had an ID card with biometric data on since 2003. This new generation of ID cards contains fingerprints and they are compulsory. These ID cards are used by immigration officials and the police. Public controversies led to an evaluation of this ID card and the use of the biometric data.

2.4.2. DNA: With regard to DNA, the law governing the collection and use of DNA is very similar to the UK pre-2000. Since 2000, the law has allowed for retention of the profiles of convicted offenders, volunteers, and suspects. These are processed and stored by the Honk Kong Government Laboratory on behalf of the police. There are presently 30,000 samples (26,000 subject samples and 4,000 crime scene stains). Suspects may be sampled for any offence, with the authorization of a Superintendent, or approval of a magistrate. Non-intimate samples can be collected in any offence with no need for consent. If an individual is convicted of any serious arrestable offence, then their DNA will be permanently retained and can be used for forensic comparison in any subsequent offence.

2.4.3. Volunteers over the age of 18 may voluntarily give DNA and this can be compared with crime scene stains. Volunteers can at any time withdraw consent and have their profile removed. There is disposal of samples and record destruction as soon as practicable if the individual has not been charged – there is an expiry time of 12 months from sampling. This can be extended for 6 months if requested by a Chief Superintendent (rarely extend more than twice). If an individual has been charged within this period but not convicted, then their DNA should be removed as soon as possible. All samples are ordinarily destroyed after 6 months. There is no public debate or concern over the use of DNA. Indeed, the public are very positive about the use of bioinformation.

2.5. ***USA:***

2.5.1. DNA legislation is separate from fingerprint legislation.

2.5.2. Racial profiling remains a dominant issue in the US. There are also issues surrounding the access to DNA testing to find alternate suspects for those convicted individuals who are trying to achieve an exoneration. In 2000 the federal law was amended, allowing for expungement of DNA records for persons whose convictions have been overturned.

2.5.3. The CODIS (national) database (NDIS) currently holds 7.5 million subject profiles, and a further 200,000 arrestee profiles. Federal law governs the National DNA database and that database can only operate within the confines of this federal law. States each have their own laws allowing for DNA samples collection from specific offenders and/or arrestees and then sent onto the NDIS.

2.5.4. Arrestees: Any state or laboratory contributing to the national index must expunge arrestee profiles if charges are dismissed or result in acquittal or if statute of limitations runs out. State legislation varies widely however, regarding the sampling of arrestees, with most requiring the arrestee to request expungement.[1] The inclusion of arrestees is

[1] States that follow the Federal expungement requirements do not generally then maintain the arrestee profiles at the State level.

a recent development and DNA Samples are mostly collected from serious felony arrestees. Federal law authorizes the collection of DNA samples from all felony arrestees and for those detained under authority of US (though this may be a very permissive criterion though technically it means when you are arrested and have your fingerprints taken.) Twenty-two states have passed arrestee laws allowing sampling of arrestees, seven of these were passed in 2009.

2.5.5. Forty-seven state DNA databases contain profiles from all felony offenders (not dependent on offence). Over half the states include juveniles in their database although most states define a (minimum) age limit. There are no volunteer profiles retained on DNA databases, except relatives of missing persons (who are placed on a restricted database).

2.5.6. A recent U.S. Supreme Court decision has held that there is no constitutional right to access DNA evidence for exoneration purposes. However, this matter is left to state legislation and almost all of the states now have laws providing for some type of p[ost-conviction DNA testing.

2.5.7. There have been over 180 cases heard in the courts on the legality of DNA databases. In the 2009 case of *USA v Pool (California)*[2], it was affirmed that samples can be taken from arrestees and that DNA databases can be used solely for law enforcement purposes:

> The court holds that after a judicial or grand jury determination of probable cause has been made for felony criminal charges against a defendant, no Fourth Amendment or other Constitutional violation is caused by a universal requirement that a charged defendant undergo a "swab test," or blood test when necessary, for the purposes of DNA analysis to be used solely for criminal law enforcement, identification purposes.

2.5.8. There is ongoing debate over familial searching. It is not undertaken at the national level using CODIS as this is not authorized under federal law, but the decision whether to use the technique is left to states.

2.5.9. There is presently just one state that requires destruction of the offender's DNA sample (although there is suggestion that such destruction has not taken place even in this state). There is clear argument for retention of samples, for quality assurance confirmation processes, and also for any required re-testing of the sample and checking of thumbprints. These processes are not possible if no samples are retained. Offender samples are also kept in the event of the development of future technologies. However, sample retention remains a real issue with no clear consensus.

2.5.10. There is a multiplicity of policing databases, at all levels in all localities which makes generalisations near impossible. There are laws and regulations on what research can be undertaken using the DNA records stored in the national database. NDIS only contains 4 pieces of data: the DNA profile; laboratory identifier; the specimen ID number; and the identifier for the person responsible for that profile. States determine if a DNA profile uploaded to NDIS. Approximately 15% of the 'hits' occur at the national level, most DNA 'hits' occur at the state level.

2.5.11. All labs uploading DNA records to NDIS must be accredited to the Quality Assurance Standards issued by the FBI Director. ASCLD/LAB and FQS are approved accrediting

[2] *U.S. v. Jerry Albert Pool*, (CR S-09-0015 EJG GGH, Eastern District of California, May 27, 2009).

agencies. The Federal DNA Advisory Board recommended the original Standards to the FBI Director. The task has been delegated to the Scientific Working Group on DNA Analysis Methods (SWGDAM). Recent revisions to the Quality Assurance Standards were approved by the FBI Director and these revisions took effect on July 1, 2009. Each laboratory must undergo an external audit every 2 years (every other year, the audit can be internal). The FBI reviews each external audit of a laboratory participating in NDIS to ensure that the appropriate corrective actions, if necessary, have been implemented.

2.5.12. Before the expiration of its statutory term, the Federal DNA Advisory Board considered privacy in relation to the databases and discussed the permitted uses of DNA databases. The Board approved a resolution endorsing the FBI's and Department of Justice's interpretation of the Federal DNA Identification Act that generally limited access to the national DNA index to criminal justice agencies.

2.6. ***ICMP:***

2.6.1. The International Commission on Missing Persons was set up by Bill Clinton at the G7 summit in Lyon. It is an international high-level organization, taking guidance from various laws of governance and being subject to international law. The ICMP mandate was expanded by Colin Powell

2.6.2. DNA is used to sample missing persons and human remains, wherever found. It is then used to identify people, very often found in mass graves. Use of DNA in this field is becoming standard for ensuring accurate identifications. Usually there are only skeletal remains by the time the government become interested in identifying the dead after a conflict. The ICMP are supposed to be helping the government establish the rule of law.

2.6.3. The Marper ruling was very important for prompting serious thought about retention periods. All DNA samples used by ICMP are voluntary but nevertheless there need to be clear policies, and those DNA samples retrieved are clearly not taken with consent. Retention periods may not be meaningful because the DNA can always play a part in war crimes tribunals and if it is to be used the retention period is frozen.

2.6.4. The ICMP have been considering where should their standards come from? Where to locate appropriate standards? A further issue is that DNA experts give a probability of a match while the odontologists say 'it's a match' which is problematic when relying upon both professions in the identification of a deceased.

2.7. ***Belgium:***

2.7.1. DNA: Belgium has one of the smallest DNA databases, owned and run by the Forensic Science Institute. The crime stain database holds 18,000 profiles and 16,000 convicted offenders are registered. Eleven percent of hits are 'between cases'. The law on DNA is being updated in September 2009 so that all profiles of crime stains will be automatically uploaded and compared. (It used to be the case that a magistrate would have to request this to happen and lots would not so lots of information was being lost). The list of those convicted who can be sampled has been expanded so that all those now receiving at least 5 years will be sampled (used to be just some sentences of at least 5 years). Convicted offenders now will have to be removed from the database after 20 years – instead of 10 years after death. This came about while trying to find a 'balance' so that the government can keep more people on the database, but more limited time restrictions are put in place.

2.7.2. There had been calls for a suspect database (sampling upon arrest) but a decision on this has been postponed. When there is a positive match with a crime stain on the database – then the suspect profile is kept with the stain – so there is a partial suspect database after all. The suspect stain is kept then only if they match with a crime stain

2.7.3. 'No hits' are no longer reported, so reducing use of paper and time. The DNA profiles need to match at 8 loci before a match is declared. A new article is being written into the law about international exchange of data which will then permit exchange under the Prüm Treaty. At this time, DNA exchange can be undertaken on an individual basis upon the request of a magistrate but this is not automatic, automated exchange is not yet possible.

2.7.4. Fingerprints: The national fingerprint database holds fingerprints of 40,000 persons (suspects and convicted offenders). The governance of fingerprint powers relies completely on regulations (not statute). All fingerprints and scene marks can be retained permanently. The police remove fingerprints of victims routinely although there is no official rule that dictates that they do this, but a lot still remain on the database.

2.8. ***Germany:***

2.8.1. On the German DNA database there are 650,000 subject profiles and 150,000 crime scene stains. The database is now ten years old but it had a 'rough' start. Legislation had to be written retrospectively as laws were not put in place when the database was established. The database can now store DNA data from suspects and convicts. They do not retain the samples for data protection purposes. DNA profiles are not considered sufficiently critical to require special treatment under data protection laws. A suspect may agree to have their DNA sampled without a court decision. DNA profiles from convicted offenders are kept for at least 10 years. Thereafter, there is a review every 10 years and a decision taken whether to continue retention. For juveniles the reviewing period is every 5 years and then 10 years once an adult. So profiles can be removed after 10 years if no new offences occur or the risk of recidivism is considered negligible. The entry level for inclusion on the database is being charged with crime which could attract a sentence of at least 1 year imprisonment – or all sexual offenders. For minor offences, convicted offenders are only retained if they are a repeat offender.

2.8.2. Mass screens were not regulated in Germany until 3 years ago. However, there was a concern that volunteered DNA would find its way onto the database. Mass screens are now regulated by a judge, who has must be provided with evidence that the DNA screen is a good means to detect an offence, which has to have been a violent or sexual crime. This decision cannot be appealed (which is unusual).

2.8.3. Germany presently only has 7 common loci with other European countries so will need to be changes made to testing before can engage in automated DNA international exchange.

2.9. ***Interpol:***

2.9.1. There is a 'I-24/7' connection between 187 national law enforcement bureaux (with 81 having expanded INTERPOL services).[3] In 2006, a third international survey on the use of

[3] INTERPOL continued to work in 2008 on I-link, a state-of the- art criminal information management system, due to be launched in successive phases during 2009. I-link's powerful search functionality will enable investigators across the world

DNA was undertaken, due to be published in late 2009. This survey includes data on 172 countries and 149 countries sent Interpol further data. They survey results are broken down into regions. Fifty-four countries have a national DNA database and a further 26 are in the planning stages. The Interpol DNA Charter has been signed by 29 countries, with Turkey being the latest signatory. The Interpol DNA database includes over 90,000 samples from 51 different countries and they are reporting more inter-continental hits. There is to a second edition of the Interpol DNA handbook in published in late 2009.

2.9.2. Interpol's AFIS is to be expanded to 1m fingerprints in the next year. There has been a resolution drafted for October 2009, calling for member countries to submit fingerprints and DNA profiles from selected crime scenes – and arrested foreigners. There continues to be an increase in international co-operation, particularly when large events, i.e. Typhoon Frank in the Philippines.

Session Three

Three presentations were given, covering the Canadian Parliamentary review (David Bird), the NAS report (Robin Williams) and the Swedish Initiative (Peter Gill).

3.1. ***David Bird***:

3.1.1. Canada faces the same issues around fingerprints that the Marper case brought to the forefront.

3.1.2. Canada began using forensic DNA profiling in 1989. In 1995 there was a serious sexual assault against child in Montreal. Until this time, a DNA database had only been under consideration but this brought it to the top of the political agenda. A DNA warrant scheme was then placed in a special Bill. Similar to the Dutch system, this required a judge granting permission to sample a suspect to link DNA with a crime scene. Provincial governments however requested greater powers to take samples.

3.1.3. There was an attempt to pass a Bill in 1997, but it was not well drafted so it did not pass initially and had to be re-drafted. There has been a series of Acts between 2000 to present, expanding the system but really changing very slightly the eligible offences for inclusion on the database. In the 2000 Act there was a requirement for a 5 year review of the laws surrounding DNA use, this review commenced in 2009 and there have been two reviews of DNA legislation in 2009. Recent Parliamentary debates have been 'contentious', with lots of privacy rights groups wanting a very restricted DNA database. This has resulted in Canada having one of the most privacy-driven DNA databases internationally. The Canadian Senate have been thoroughly examining all aspects of the current Canadian police use of DNA. Political realities mean that a lot of what happens to the law depends on who is sitting on the oversight committee(s).

3.1.4. The Royal Mounted Canadian Police run provincial laboratories and there are also two independent laboratories run by provincial governments. These provinces have databases that feed into a national DNA databank crime scene index.

to establish connections between individual crimes that might otherwise go unnoticed. (INTERPOL Annual Report 2008, available at: http://www.interpol.int/Public/ICPO/InterpolAtWork/iaw2008.pdf)

3.2. ***Robin Williams:***

3.2.1. The recent US National Research Council (NRC) report 'Strengthening Forensic Science in the United States' provides an important critical perspective on the current standing and future prospects of forensic science, including the uses of forensic bio-information. It has global relevance despite its domestic origins

3.2.2. The US National Academies of Science (of which the NRC is the 'operating arm') provide authoritative advice to the US Government on scientific issues and its deliberations can be expected to be influential even if their recommendations are not always supported by legislation or financial provision.

3.2.3. There are three recurrent issues on which the Report focuses attention. The first of these is the necessity to improve the scientific foundations of forensic practice. The Report argues for the development of a body of knowledge derived from core scientific disciplines offering 'data-based probabilistic assessments of the significance of claims' for the validity and reliability of all forensic techniques.

3.2.4. The second issue is the encouragement of efforts to standardise routine forensic science practice. Such standardisation of protocols needs to be supported by the accreditation of 'laboratories' and the certification of competent individuals.

3.2.5. The third issue relates to the governance of forensic science. The Report recommends the establishment of a new 'Governing Entity' for forensic science which is independent of, and superior to, existing agencies that seek to govern practice and innovation in this field. A 'National Institute of Forensic Science' is recommended, and this agency will 'oversee and direct' the forensic science community

3.2.6. The Report's treatment of the two forms of forensic bioinformation relevant to the Symposium stresses the considerable epistemic differences that separate the practice of DNA profiling to that of fingerprint comparison. These differences exemplify an underlying tension within forensic science between those disciplines which are 'analytically based' and those which are based on expert interpretation of visual patterns.

3.2.7. Some outstanding issues were highlighted for possible discussion. These included: the absence of consideration of 'downstream uses' in addition to 'scientific basis'; the relationship between the proposed US regulatory framework and the frameworks emerging in other jurisdictions; the relationship between the ways in which the scientific community approaches issues of validity and reliability and the preferences of judicial actors.

3.3. ***Peter Gill***:

3.3.1. There is a proposal to add 5 new loci to the Interpol DNA profiling system. This was first proposed to the EU in 2007 by the German Presidency. All ideas were initiated by ENFSI's DNA group. There is a long lead time between identifying the need for new loci and actually getting them. ENFSI considered various options, (i.e. why not use the CODIS loci? This was considered not powerful enough by today's standards). The new loci (Next Generation Multiplex - NGM) are discriminating but also have low molecular weight so it can be used on degraded samples. This new kit is due to be ready in few months time, with AB and Promega producing kits by the end of 2009.

3.3.2. During the Swedish presidency of the EU, there is a commitment to taking this new DNA marker system forward. There will need to be new marker systems added to the existing marker systems in use, ideally these would be mandatory. Presently there are more than 20 different multiplexes being used around EU. This prevents international exchange from being efficient and effective. Lowering the number of loci on which a match can be declared risks the whole system of exchange collapsing under the weight of false matches.

Session Four: Governance.

Governing DNA profiles, samples and fingerprints: a review of issues and questions identified from the UK seminars informed by the presentations during Sessions Two and Three

4.1. Current developments in forensic science policy and practice, recent critiques of the historical arrangements for the collection, retention and use of forensic bioinformation, together with the growing number of collections of bioinformation in medicine, all make for urgent consideration of the adequacy of the current governance of forensic bioinformation.

4.2. Whilst some have argued that there is a need for a single piece of legislation in the UK which provides the framework for the governance of all collections of forensic bioinformation, others have argued that greater consideration has to be given to the intended uses of such information prior to consideration of the appropriate legislative framework. In the more complex legislative context of the US, many States have established frameworks which govern different aspects of the taking, retention and use of DNA samples and profiles

4.3. It is useful to think about what aspects of DNA and fingerprint practice – collection from whom, comparison with what records, retained for what period of time, etc. - need to be regulated first and only then decide on the appropriate framework within which regulation should be located. (For example, in the Netherlands the storage times of DNA-profiles and fingerprints will be harmonised.)

4.4. Relevant to this consideration is also the question of what kind of data protection laws exist in relation to DNA profiles that have been generated for criminal justice purposes. In some (all?) jurisdictions, data protection regimes differentiate between the collection and retention of personal data for criminal justice and other purposes, but however these regimes operate it will be necessary to understand their application to DNA profiles and to fingerprints before we can agree on a governance model for forensic bioinformation. (The EU-data-protection-directive applies unless specific DNA-legislation determines otherwise.)

4.5. The UK experience has shown that the expansion of DNA retention enabled by legislation in 2001 and 2003 also created the necessity for keeping 'criminal' records for those who had not been convicted of a criminal offence. If *S & Marper* leads to changes in the DNA and fingerprint retention regime then we might expect the necessity for the parallel removal of 'criminal' records of those whose DNA profiles and fingerprints are now to be destroyed. This emphasises the necessity for a widespread consideration of the retention of all kinds of criminal justice information. There are several ongoing cases concerning data retention in which the decision of *S & Marper* may be an influence.

4.6. In determining whose information (including bioinformation) should be retained even if and when seemingly unlawful activity had not been subject to judicial deliberation, it may be necessary to improve the quality of information about the circumstances of any arrest and

charge as well as the reasons for failing to proceed with a case, or failing to obtain a successful prosecution of a suspect offender. Currently there are many jurisdictional differences in current practice both within common law jurisdictions and between common law and civil law jurisdictions.

4.7. In some jurisdictions (e.g. Canada) legislation operates at both State and Federal level. Whilst complexities arise from this, there are many jurisdictions in which such levels exist and it seems unlikely that relevant local agencies in such jurisdictions will easily surrender sovereignty to national bodies.

4.8. It is also necessary to distinguish between efforts to regulate the retention of DNA profiles and fingerprints taken from known individuals and those collected during the search of crime scenes. It generally seems to be the case that there is no restriction on the retention of the latter kind of information regardless of the apprehension or prosecution of criminal suspects.

4.9. One of the problems about the design of adequate governance systems is the lack of empirical evidence about what happens after DNA database matches (both scene-to-scene and scene-to-subject) are declared. This seems especially the case in the United States, but other jurisdictions also lack good data on this question. Without such evidence it is difficult to have an informed discussion of what retention and use regime is most desirable as well as how it should be regulated.

4.10. There is also a question of how one begins to approach questions of retention and use of forensic bioinformation. The British preference has been to begin by focussing on police powers and on questions of utility, a preference which has generated piecemeal legislation largely uninformed by more general considerations. An alternative is to begin by considering principled questions of human rights. The European judges have reminded us of the necessity of justifying the police retention of bioinformation which in many circumstances can be seen as a breach of privacy, but acknowledged there were differences between the three categories of personal data that would require careful scrutiny although their ruling did not consider in detail the differences between DNA profiles, samples and fingerprints.

4.11. Any system of governance has to be capable of distinguishing between these different objects of interest as well as the differing uses to which they can be put. Whilst one-to-one identification may seem the underlying ambition of profile comparison and fingerprint matching, the additional uses of DNA samples and profiles (e.g. for familial searching and for ethnic inferencing) may create special problems that need to be separately addressed in any regulatory framework or governance arrangements.

4.12. An approach to governance which began with an attentiveness to human rights principles (e.g. those embodied in the ECHR) would require identification of relevant rights and expectations – privacy, consent, transparency, accountability, proportionality, etc., etc. Difficulties in specifying the operational meaning of key terms was acknowledged to be a difficulty in this context. There was little agreement on whether this would be a way forward, or whether governance would be better shaped by reference to existing data protection legislation in each jurisdiction.

4.13. Questions of the effectiveness of data protection legislation also raise uncertainties about the powers of data protection commission staff. There is a need for better understanding of how these powers are actually exercised in the course of routine and exceptional uses of forensic bioinformation. The Dutch Data Protection Authority has the right to audit the DNA database and also uses this right.

4.14. When determining questions of retention periods, better knowledge of offending patterns as well as the potential for dangerousness all need to be subject to consideration if something other than 'blanket retention' is to be put in place. However in the absence of such data 'blanket retention' may continue to be seen as providing the best opportunities for the identification of offenders through fingerprints and DNA profiles.

4.15. The current UK Consultation Paper, 'Keeping the Right People on the DNA Database", envisages some supplementary arrangements to the current DNA database governance structure, but the scope and timing of these remains unclear. The Forensic Regulator will have no direct involvement in any oversight of the NDNAD, but will be involved in establishing and enforcing relevant scientific quality standards with respect to the NDNAD and DNA profiling.

4.16. The National Fingerprint Board no longer exists and because of this, NPIA (under the guise of Forensics21) has now taken an overview of fingerprint issues. However there is some confusion over the governance of fingerprint work. Whilst there continue to be regional meetings, practitioners would welcome better guidance on a number of quality and policy issues surrounding fingerprinting. International exchange of fingerprints is an issue of particular significance.

4.17. US National and State DNA Boards include a range of police, government, academic and civil society actors on their oversight bodies. There would be value in comparing the composition of these boards with those which exist in other jurisdictions. The relationship between these kinds of oversight bodies, regulators, and the various technical working groups that seek to establish quality standards in the US and elsewhere is also a subject of interest.

4.18. Underlying all of these concerns is the question of public confidence in the police uses of forensic bioinformation (including the commissioning of research on samples and profiles collected by the police in support of criminal investigations). In part these might be a matter of the existence of visible 'checks and balances' which have a part to play in the governance of forensic bioinformation. In part these are also a matter of who is seen as 'owning' and 'controlling' relevant databases.

4.19. There are significant linguistic issues at stake when questions of forensic bioinformation (and other kinds of police-relevant information) retention are raised. There are problems in translating key terms across jurisdictions, and there are also issues surrounding the uses of polyvalent terms like 'innocent' individuals when political arguments take place in this domain. Decisions about the proper balance between liberty and public protection need to take into account the differing meanings attributed to words like 'innocent' and 'serious crime' by a range of police and other actors.

4.20. New considerations need to be taken into account when the collection and retention of forensic bioinformation is viewed from the perspective of crime prevention rather than criminal prosecution. The traditional repertoire of checks and balances functioned largely in relation to prosecuting accused persons within the context of criminal trials. However, the modality of crime prevention requires a different approach, a different arrangement of checks and balances, and this is not always realised. Without such consideration there is a real danger of function creep, and it is easy to lose transparency in the propriety – and legality - of such uses.

Session Five: Internationalisation.

Internationalisation and exchange: a review of issues and questions identified from the UK seminars informed by the presentations during Sessions Two and Three

5.1. It is important to keep the internationalisation of crime in perspective: most criminals operate locally. However, a small number of successful and/or dangerous criminals regularly cross borders to deliberately evade detection or arrest. In addition some 'local' criminals will originate from other countries –if they have criminal records in another country, then the local police are likely to be ignorant of their background. For a minority of crimes there need to be systems in place for investigators to (easily) access information from the home country or countries of passage.

5.2. The FBI will only conduct international searches for Interpol for serious crimes. Under the Prüm Treaty, there is no limitation on the type of offence before a DNA exchange can take place: every crime can be searched. Information is provided about matches and then the judiciary and/or police can decide whether to pursue it. The cost of investigation and the severity of the crime (and perhaps whether the suspect is already in prison) will be factors to consider. Such prioritization, however, takes place after the match has been found. In the Netherlands it is up to the prosecution to decide whether to pursue the 'match' further, forensic science simply gives them the option to do so. In some countries they are compelled to take action (e.g. Germany).

5.3. Within the UK it was recognised that useful information or intelligence can be gained by swapping all crime information and not limiting cooperation to specified crime types. If an investigation is already underway, then it may be useful to try and get information on more serious crimes potentially linked to the same suspect, in order to consider whether to continue the investigation. Likewise when a crime has been committed 'locally' the investigation should include a check of the suspect's background in their country of origin if different to that of the locality of the crime. When working internationally in response to serious crime, variation in local investigation practice can be critical. The self-styled Pink Panther Gang had successfully undertaken a series of armed robberies in Belgium, the UK, France, Switzerland, Dubai and Tokyo, but was hard to detect as the members always withdrew to their safe havens in Serbia and Croatia. There, however, some members had committed minor offences and because the local police had shared information it had been possible to arrest 30 or so members.

5.4. From a continental perspective it made little sense to suggest that only serious crimes merited international consideration. Cost and context might result in different decisions irrespective of crime type. The Prüm treaty has allowed the exchange of car number plates. This costs very little and can be very effective, so can it be undertaken economically for even minor crimes, including serial traffic offences within the main EU communication corridors should this exceptionally merit international cooperation. A lot of decisions concerning international cooperation will depend on the cost. While this may be a highly relevant consideration, the cost-effectiveness and need for international cooperation may vary between types of case and even between cases. For example, there were a series of lorry load thefts being committed in Belgium and the south Netherlands, which are considered minor property crimes but over a long period the analysis of the overall impact of these crimes indicated their true, much greater significance. This demonstrates how it can be a false economy to limit cooperation and

exchange to serious crimes, in each case there can be an individual decision about the efficacy of exchange in that investigation. Indeed, it is often stated that the most effective way of solving serious crimes is for the police to allocate adequate time and resources to investigating property crimes as the people committing serious (and often sexual) offences will normally have a background of burglaries etc. They could also be committing minor crimes in one place to obtain money, and serious crimes, including serious sexual assaults, in another, so there is a case for routinely exchanging unsolved crime data for even the most minor crimes, which could then prevent further serious offences.

5.5. There is a new tool for police to detect the travel activities of criminals, using the stolen and lost travel document database operated by Interpol. Several countries are connected directly to the database which can then be integrated within their border controls. The Interpol Stolen and Lost Travel Documents (SLTD) database has 16.7 million records at the end of 2008 and has handled 76.5 million search requests, identifying 14,465 stolen or lost passports and travel documents.[4] It is used by 145 countries. This has proved very effective and fairly low cost and not particularly problematic in terms of data protection etc. as it is a simple exchange of numbers etc. Use of the database just requires the online connection to Interpol.

5.6. The police will always start cooperation efforts with serious crimes because of public and/or political pressure, so in the case of serious crimes, forensic bioinformation may be readily exchanged. However what a more integrated/ effective exchange mechanism is required so that cooperation can be easily and effectively expanded to incorporate minor crimes.

5.7. Interpol does not want a copy of all countries' databases. They should select data to upload to Interpol according to their national criteria, so each country requires a selection process to be in place. For instance, the Swiss police are sending increasing numbers of DNA profiles to Interpol based on a national selection policy. There are a lot of matches (approximately 20/25% of submissions resulted in a hit), and this may be due to the fact that they have someone making a selection of those profiles they think will have an international aspect.

5.8. In the US, on average 15% of hits on CODIS are between states, but this is often much higher - 20% to 30%- for smaller states in the North East. This may come to be replicated in smaller European countries, with easier border crossing for criminals within the common travel area.

5.9. On the other hand the increased swapping of data, especially based on just seven loci, may well result in a lot of false matches overloading investigators and exposing the innocent to the trauma of a police investigation in a foreign country. There may need to be a word of caution and countries need to consider their legal, scientific and operational processes to take into consideration what can be achieved manageably with minimum risk. The Netherlands does not exchange personal data based on 6- or 7-locus matches. Additional DNA-testing is required to determine if the match is a false positive or a real match.

5.10. No substantial ethical or societal problems arose through identifying someone (or a body) by using the criminal bioinformation database, although this might not lawful in some jurisdictions more as a matter of omission (as in the UK prior to changes made in response to the 2005 Tsunami). The majority of identifications of unknown persons (as 'cold hits' when no more immediate information was available), are made using the criminal bioinformation databases. National legislation often provides for the use of forensic databases so legally there is no problem with using such databases.

5.11. Ideally enquiries should be made to identify the nationality of individuals upon arrest and check whether they are wanted in connection with crimes elsewhere. In practice, the cost and

[4] In 2008 alone, law enforcement officers internationally carried out 25 million searches of the database, resulting in the identification of over 5000 individuals travelling on fraudulent documents.

effort of deporting very minor criminals is not considered efficient, so this rarely happens. When considering sending people around the world (deporting them, using international arrest warrants etc.), there is a cut-off point where serious cases will not prompt a European arrest warrant. If the individual can serve a sentence domestically (and there may be concerns about the process and the kind of sanctions in another country) then that would make a difference. It can be difficult to persuade country to implement a sanction for a crime committed in another country. Within the United States, however, as a federal country, offences committed in one state can often be dealt with in another.

5.12. Is it worth the EU investing a large sum of money on 5 new loci if this does not also result in improved cooperation outside the EU? For example, a significant proportion of crime (volume and serious) is linked to British Commonwealth countries. Moreover, Switzerland is not a member state of the EU but Swiss citizens are often a minority within the arrest statistics for certain offences. CODIS is the world's largest database has there been an attempt to co-ordinate future strategy between the EU and USA?

5.13. The 7 Interpol loci are shared with the CODIS core loci, but there are 20 to 30 different multiplexes currently being used. On a practical level, loci cannot be subtracted from a marker system, they can only be added. There is some optimism that the USA will adopt an additional 5 loci that have been endorsed by ENFSI. The FBI are considering changes but they may be considering adding a further 3 loci from SGM+ on top of the new 5. The FBI would ideally like to have a 20-multiplex system, however, that may not be possible given the current technology. In the meantime within the EU it was estimated the five new loci would ensure sufficient levels of discrimination for another five years.

5.14. It is a mistake to think that there is strategy at EU level. There is no political impetus at present, and all work to date has been instigated and carried out unfunded, by ENFSI. These are people who care about the issues but do the work for nothing. ENFSI do collaborate with SWGDAM and SMANZL but it is quite difficult to co-ordinate and collaborate effectively with no funding and no formal mandate to seek to promote coordination with North America. It is regrettable that there is no international co-ordination on these issues. It would be much better if there was some European political interest in the issue of forensic bioinformation exchange. Countries may send someone to ENFSI, but there is no requirement to, and ENFSI cannot coerce involvement, so each country is effectively working just on a national basis.

5.15. Canada has a small national DNA database. In order to make exchange with the US feasible, there is a requirement for a higher number of loci to avoid partial matches. There is a 'Tower of Babel' problem with international exchange. There is a need to avoid all smaller databases having their own marker and software systems and not enough in common to facilitate communication between databases. Any system of international exchange cannot work until there enough loci to enable matches to be discriminating enough. Ensuring this will be costly but the benefits should outweigh the costs.

5.16. An effective international exchange system has to be purely automated/electronic (Prum is). Faxes etc. are unsuitable as people will not be capable of inputting accurately a sufficient volume of data manually. Automation would help to ensure an efficient system as there are already significant backlogs at national levels.

5.17. It is clear that there are serious crimes that could be solved or possibly even prevented. This will be possible only if the technical difficulties in exchanging bioinformation data internationally can be overcome. This includes finding solutions to the technical/ logistical problems at present.

5.18. More could certainly be done in terms of standardization but in this respect a great deal has been achieved with DNA already in comparison with a many other evidence types.

5.19. It is normally understandable why it is difficult to share data internationally as there are national interests that come into play, but in this instance, there is lots of enthusiasm for exchange of data. It would therefore seem that there should an easy case to make to politicians as bioinformation exchange is a factor in two currently high priorities – transnational crime and the forensic use of DNA. Both of these are very important to politicians, so it is curious that there is lack of funding. What are the real inhibitors of getting it on the agenda?

5.20. The only international organization currently working on international bioinformation exchange beyond Europe is INTERPOL.[5] They use 24 loci in their matching system. Interpol would amend their systems if the EU countries were to add more loci. However the minimum standard currently is 7 loci which is the lowest standard as these are the only ones that all EU countries have in common. For practical purposes many of the 24 loci are virtually redundant or irrelevant. There was perhaps a need to have the minimum loci set much earlier and much higher, and then these parameters could have helped to determine the loci adopted for use within individual countries.

5.21. In China they were using Identifiler, the same as Hong Kong, but they are now developing a new kit with 15 loci: Sinofiler. Some time ago they took out 2 loci from Identifiler and added 2 Chinese loci into their test kit. At the moment they are doing 50/50 Identifiler/ Sinofiler – but they are working towards a 100% Chinese kit.

5.22. It will require scientists to sort methods for avoiding adventitious matches. This is not possible for millions of existing DNA-profiles. Matches with "old" profiles will require additional DNA-testing to eliminate false positive matches. However – if there are adventitious matches, this is not always a disaster, as investigators will also be able to eliminate some fairly easily (a lot of the adventitious matches will require little by way of investigation because it will be apparent that the individual has nothing to do with the crime under investigation).

5.23. The EU Data Protection Commissioner has been highly critical of Prüm, and has indicated his wish for general EU-data protection rules in stead of Prüm-specific data protection rules. The divergence in protection standards in different countries means there may be a reluctance to share data when adequate data protection is not in place in the exchanging jurisdiction.

5.24. With regard to fingerprints, there are some agreements in place internationally, e.g. over file format for transmitting information. However that is not a great deal and there is no agreement about issues such as image quality. It is perhaps an issue that ENFSI could work on. A great deal of discretion is left however, to the companies developing new systems – i.e. LIVESCAN etc. There is not a big issue with regard to tenprint to tenprint comparisons, but crime marks to tenprint comparison can be very difficult with huge variations in image quality.

5.25. Presently, Romania is trying to locate a number of serious criminals and making multiple requests to the UK to assist in locating them. This is costing the UK a lot of money and there are actually not many direct benefits for the UK. The UK has also now been approached by Albania. In Romania, their system of fingerprinting is very old – all manual/ ink prints. This means that fingerprint exchange is slow but can be done.

5.26. Interpol has a recommended standard for international exchange of fingerprints, but what exactly is an 'international standard'? How is it declared or enforced? Despite this, it was suggested that Interpol had an absolutely critical role in seeking to promote the development of international standards and assist the international community in breaking down obstacles to their being adopted.

[5] EUROPOL use DNA profiles in their Analytical Work Files, but are not 'exchanging' DNA with other countries for specific criminal investigations as such.

5.27. It is expected that there will be a new round of challenges to fingerprints in the US since the NAS report. This may well be the time for a thorough review of the 'scientific' nature of fingerprinting.

5.28. There is an exercise undertaken by the ENFSI fingerprint working group which is trying to establish what is being done in the different EU countries, their methods, their testing procedures and competency testing etc. This will systematically analyse differences of approach across the EU.

5.29. The International Association of Identification (IAI) and ENFSI fingerprint group have links, but they need greater visibility and greater international cooperation.

5.30. While some organisations were working on probabilistic approaches to fingerprints, there is a need to make such highly complex and statistically sophisticated systems more intelligible to practitioners.

5.31. In the Netherlands, there is a requirement for biometrics in travel documents, so there are databases of fingerprints/ iris scans etc. but what is the relationship between these databases. Are there Chinese walls between them?

5.32. There had been some discussion in the relevant UK seminar about the proposal to upload convicted foreign sex offender offenders' profiles to the Interpol Gateway. This was raised on the grounds that UK offenders with such convictions were also likely to travel to commit crimes. In discussing the feasibility of a pilot programme to upload such UK citizen profiles it was felt that if not enough data is exchanged internationally the results would be very poor and then the pilot may be considered a failure, which will then hinder arguments for international exchange. The benefits of cooperation will not be noticeable until done on a larger scale than small pilots.

5.33. A lot of countries are prohibited by national rules/ law from uploading the DNA profiles of their convicted offenders in another jurisdiction. For example, the U.S. is not currently authorized to share the DNA records in NDIS with foreign countries. There needs to be a search request network so that unsolved crime stains are sent to countries that they can then search against their database. Interpol is set up with I-24/7 to help with such a search request network. The G8 are also setting up a network and at present are engaged in drafting the rules to ensure that privacy is adequately safeguarded.

5.34. Where countries are not prohibited, as is the case of Canada, from uploading data abroad, the difficult at the moment is that while there are complaints that the Interpol database is not big enough many countries are refraining from uploading their data to make it bigger. There is a scheduled meeting at end of 2009[6] to try and persuade countries to think more seriously about uploading their data to Interpol Gateway.

5.35. The issue of quality assurance again comes down to funding and lack of official coordination, compulsion and political pressure. There should perhaps be an overarching European laboratory to set standards across Europe on the model of the US National Institute of Standards and Technology (NIST). If Europe is unable to organise such an institute or central laboratory, then the lack of quality standards may scupper all international cooperation plans. Such an institution could also address a major educational gap – not just in respect of fingerprints but also DNA where many practitioners needed to be better trained in increasingly complex interpretative methodology. There is also a need for a facility to train the trainers.

[6] Now postponed to late 2010.

5.36. There is a need for compulsory, universal accreditation (ISO17025). This is standard in the US, but the same qualifying criteria (for use of CODIS) applies to laboratories requesting searches of the national DNA database and the FBI turn down a lot of CODIS search requests from other jurisdictions because they cannot ensure the data originates from laboratories that are independently accredited. In the UK there is a requirement for accreditation before loading onto the NDNAD. The Swedish Initiative calls for a requirement for all DNA laboratories across Europe, and all fingerprint activities to be accredited to ISO17025. The UK regulator is supporting this initiative in principle, though there is a concern that it covers interpretation and this is costly and for fingerprints there is work to be done before accreditation can go ahead.

5.37. It was suggested that accreditation had been seen as an Anglo-Saxon preoccupation. Interpol recommends accreditation but some countries it is still really not seen as an issue: a police laboratory is a police laboratory. Accreditation needs to stretch to all kinds of expertise and all laboratories because sometimes the bioinformation evidence is ruined by others before it gets to a laboratory, for instance drug analysis by an unaccredited private laboratory might subsequently create problems for an accredited laboratory that then examined the material for trace evidence. There is a need for quality assurance for all kind of experts and analysis.

Session Six: Evidence and assessment

How to assess the impact of bioinformation/ factors that contribute to greater effectiveness: a review of issues and questions identified from the UK seminars informed by the presentations during Sessions Two and Three.

6.1. There is increasing demand for better data on use of forensic bioinformation, while there have been previous critiques on quality of current UK data provided. This data is necessary if there is going to be evidence-based policy. However, the criminal justice system as a whole is not good at producing 'evidence'. The official data sources in the UK are varied and change over time. The NDNAD annual report contains lots of information but does not provide information on what is happening to data.

6.2. What should we expect from police forces in terms of data? The landscape has changed from what the police used to provide and there is now a particular focus around the success or otherwise of the investment in the NDNAD. The problem since *Marper* is that the police are now being asked to gather different data. Even simple questions can actually be really challenging and very difficult to answer. The IT and systems to answer the questions being asked now are not in place. There is also a reluctance to start answering lots of questions when it is likely that there will be others ones emerging very soon afterwards.

6.3. In the US there is no data on what has happened to 'hits' once they are reported to local law enforcement agencies. There is a need to know if there are tests being done that are not leading to arrests or prosecutions as this would be important in terms of attempts to clear backlogs – we first need to make sure that laboratories are conducting effective testing first.

6.4. In Canada, there a lot of questions asked but there is no compulsion for the police to answer. Very often the answer to the question: "what happened…" is that nothing happened after the DNA hit, which then leads to a lot more questions and escalates into political questions and can become an audit of policing.

6.5. The audit culture has been prominent in UK for years but it was late to reach the police. The police however are now coming under strict(er) scrutiny. It was very frustrating trying to

resource answering the questions during the DNA expansion programme. Since then there has not really been the right data capture in place in the UK. The courts do not provide data, but then we cannot tell why people do not get convicted and will rarely have much to do with the bioinformation, there will lots of issues.

6.6. The reality of different systems in place in different police forces which make life even more difficult with regard to collating data.

6.7. What type of information is required? This is not self-evident. There is clearly a need for data on failures and where (why?) the bioinformation did not 'work'. Data on how 'useless' or insignificant matches can be would also be illuminating. Sometimes the failure to match a suspect is also important in an investigation and this data would also need capturing.

6.8. Forensic providers get paid on the basis of their success rates, so they have to collate data on their success rates. As soon as you try and collect this data you realize how flexible it is. It is in the hands of police what they submit to a laboratory and there are far too many correlates, trying to get a concrete measure of 'success' is very difficult. Attempts have been made by John Bond, looking at the contribution of DNA to investigations.

6.9. There are official statistics and research projects – very different things. Case studies can also be very useful/ powerful.

6.10. How does one persuade policymakers to invest in bioinformation technology without statistics? What evidence is used to persuade the policymakers?

6.11. A leading sociologist in The Netherlands recently reviewed 50 years of social science research and tried to determine the impact. The results were that if the research conclusions complied with intuition then the project was deemed a waste of money, however if they contradicted common understandings, then people doubted the results. A similar thing could happen with research in this area. There are preconceived notions among politicians about DNA which are hard to challenge. This is compounded by lots of confusion around statistics. We remain then largely in the dark as there is a lack of good statistics on lots of things i.e. arrests/ re-conviction.

6.12. There can be helpful discussion about 'links' which are useful to investigations. Links to whoever it may be can be useful – if not incriminating evidence per se.

6.13. In fingerprints there has been lot more information collected - including how long it takes to react to fingerprint matches. This information was wanted as there was a priority set to speed up reaction times, to get results of fingerprints examinations reported in under 24 hours. A lot of investment went into speeding up fingerprint processes and then when all this was done, the reports were found to sit in 'in-tray' for days. It shows that it depends what the priority of the day is to what question wants to be answered.

6.14. There are concerns around the data collection regimes put in place by the NPIA, since the end of the Police Standards Unit (PSU). There is a partnership required and a need for continued collaboration to get lots of agencies working together, and a further need for someone to drive the work. It is difficult to pin the Home Office down to instruct the DNA Custodian what data they want generated. The Home Office do not know what data they want.

6.15. In the US, the Bureau of Justice Statistics collects a lot of data. However, there remains a need for academics to gather information and overwhelming secrecy is a real problem as many cannot persuade the official bodies to release data. There is a need to engage and encourage academics to get involved in order to provide gains on both sides. There is a need for good analysts and these can often be found in academia.

6.16. There are lots of DNA matches taking place internationally yet no countries report back their successes to the international body. Austria has centralized their reporting and it is producing very good results.

6.17. There is an ongoing need for academic research. In the medical sphere, there is a vast amount of peer reviewed research that is not very good. Therefore we need lots of research but that research must be top quality and must be impartial and bias-free. It also requires very focused questions.

6.18. In The Netherlands, there is a parliamentary research body which looked at the impact of the DNA Acts of 2001 and 2005. However there are no agreed parameters with which we can measure the effectiveness of DNA collection. There is the potential to reach a consensus about what can be measured but many people will differ over what is important. The significance of 'matches' depends on the case.

6.19. The ICTY (International Criminal Tribunal on Yugoslavia) has a central unit (demography unit) which looks at DNA evidence in relation to other evidence and the weight of the evidence in a case. The Helsinki committee just reported on this issue.

6.20. In the UK, IT systems are hindering data collection. It makes collating any information very difficult. Sensitivities around privacy etc. also mean there has to be attempts to de-link information, and then collecting information is almost impossible when the data has been 'de-linked' already. Post-*Marper* the IT demands are enormous. It is really about a business process that has to be engineered from scratch.

6.21. In US there are indexes set up so that they can tell a lot more about the data, although the states control which part of the index the profiles get put into. The arrestees may be convicted people yet if the state does not move their profile over from arrestee to convict – the FBI would have no idea.

6.22. There may be time-frame issues between finding a match and getting a conviction. It can sometimes take an awful long time for actions to take place and this will then not be reported as the reporting period will be over.

6.23. The NIJ has funded a lot of DNA research grants but these have largely been about backlogs etc. The FBI has no influence over such funding. However, access issues may be more important than funding. Access issues are a matter of law, and the law states that the DNA records are available to criminal justice agencies. These legal restrictions are in place ostensibly because of privacy issues; DNA research is sensitive.

6.24. In Canada there is a Centre for Justice Statistics. This measures what it can measure, which means that it largely just looks at whether the law is being complied with.

6.25. Criminal justice cost effectiveness studies are very much in their infancy. In the UK, attempts to assess the value of forensic science had been hampered by incomplete data from the police, and there was always the risk that benefits may be geographically dispersed and materialised over a long time-scale, well outside the lifetime of most conventional studies. In the next 10 years – (there is likely to be a decade of almost unprecedented financial stringency) – forensic science will be very much at the mercy of crude accounting techniques. The UK criminal justice system lacks the presence of a body modelled on the National Institute for Clinical Excellence (NICE) that attempted independently and objectively to evaluate the benefits of different treatments. While it had its critics, those who had examined its studies considered that NICE had transformed (for the better) the evaluation of clinical interventions.