

National DNA Database Ethics Group

Notes of the 35th meeting held on 13 September 2016 at Home Office, 2, Marsham Street, Westminster, London, SW1P 4DF

1.0 Welcome and Introductions

- 1.1. The Chair welcomed all to the 35th meeting of the National DNA Database Ethics Group (EG). No apologies had been received.
- 1.2. The Chair welcomed Carrie Golding and Wendy DuChesne, Home Office Biometrics Programme (HOB); Chief Constable Iain Spittal, Cleveland Police; June Guinness, Forensic Science Regulation Unit (FSRU); Kirsty Faulkner, National DNA Database Delivery Unit; Paul Wiles, Biometrics Commissioner (BC) and Gemma Gyles, office of the Biometrics Commissioner.
- 1.3. The Chair requested that members declare any conflicts of interest with agenda items as they arise.

2.0 Note of the Previous Meeting and Matters Arising

- 2.1 The note of the previous meeting had been approved via correspondence and published on the EG website.
- 2.2 Matters arising were discussed:

Action 1: The Secretariat to apply the definitions of 'biometrics' and 'forensic' from the Home Office Strategies to the Terms of Reference for the new Biometrics and Forensics Ethics Group. These terms of reference were in preparation and would be provided shortly.

Action 3: From meeting held on 18 Feb 2016: Invite the policy leads from the Custody Image Review team to an EG meeting to provide an update on the conclusions from the review. The Home Office had entered purdah due to the European Union Referendum and therefore the Custody Image Review publication had been delayed. The Secretariat would inform the EG when the review was published.

Action 4: From meeting held on 27 November 2015: Shazia Khan to provide an evaluation of the Metropolitan Police Service (MPS) Y-STR pilot project when complete. The evaluation is still in progress and will be provided once complete.

- 2.3 All the other actions were complete or were agenda items for the current meeting.

3.0 Home Office Biometrics Programme & Strategy & Privacy Impact Assessment

- 3.1 Carrie Golding and Wendy DuChesne from the Home Office Biometrics Programme (HOB) provided an overview of the HOB programme and their plans for a privacy impact assessment (PIA) of the programme. The Ethics Group (EG) heard that contracts for existing Home Office biometric systems were coming to an end in 2019 and a key objective of the HOB programme was to be able to provide continuity of existing services as well as developing future capability. The privacy impact of these capabilities would be considered as steps were taken to make changes. The EG were informed that the HOB programme consisted of three main modalities: DNA, fingerprint identification and facial recognition. Further details of the three modalities were provided;
- DNA – the current DNA platforms required investment to ensure continuity, stability and robustness of the systems. Parliament had voted to re-join Prüm and so the exchange of DNA with other European countries would be included within the HOB programme;
 - Fingerprints – the focus would be on mobile solutions to allow police officers to check fingerprints at front end policing in order to apprehend offenders quicker and to prevent people being unnecessarily detained. In addition, the programme would enable a single point of access to facilitate the existing ability to cross search systems between immigration and law enforcement. The existing algorithms would also be improved;
 - Facial matching – the group heard that this was currently limited to use within Her Majesty's Passport Office (HMPO) with watch lists used for verification during passport renewals and future capabilities would include being able to find imposters within a passport database.
- 3.2 The Centre for Applied Science and Technology (CAST) within the Home Office had been commissioned to investigate the potential uses for voice as a biometric identifier. This work was in its early stages and is not currently within the scope of the HOB programme.
- 3.3 The EG heard about the PIA of the HOB programme. Individual project managers had been asked to identify whether their areas of the programme required a PIA which would feed into an overarching PIA, to be delivered by December 2016. The work would be supported by the Office of the Information Commissioner (OIC) and a series of workshops had been set up with the OIC to ensure project managers understood the importance of the PIA. The PIA would be a living document and would be updated at regular intervals. Whilst the PIAs in individual areas had been completed it was suggested that a bigger piece of work was required to assess the cumulative impact of hosting multiple modalities on one platform. The Home Office noted that they would be grateful for the advice of the Ethics Group in relation to the PIA of the HOB programme.
- 3.4 The Chair provided the view that the EG needed sufficient time and a sufficient level of briefing in order to be able to analyse the impact of the changes and comment on the HOB programme and the PIA. At previous meetings the EG had raised concerns about the convergence of these modalities and therefore, ideally

the EG should have been involved at an earlier more formative stage. HO representatives emphasised that the convergence of these modalities had not yet happened and the current focus was the stabilisations of existing services. It was noted that it would be useful for the EG to be made aware of the perceived explicit benefits of the HOB programme and the explicit aims of what the programme was hoping to achieve.

- 3.5 The point was raised that the HOB programme covers a far wider scope than the current remit of the Ethics Group. Members had been aware that the scope of the Ethics Group would be widened to include forensics and biometrics but had not been aware that the new scope would include going beyond the remit of the criminal justice system and into immigration and UK citizenship.
- 3.6 Further concerns were raised that ethical issues of the HOB programme would be far greater than just privacy and equality, public good, discrimination, justice and fairness should also be considered. The Ethics Group suggested that focusing on privacy was both problematic and outdated when considering bringing together different infrastructures. It was suggested that a tool developed for the European Commission called the Assert Tool¹ would be a suitable tool to use. The tool listed the types of questions and dimensions that needed to be considered, such as who would be affected and entitlements, and would be a good starting point for undertaking a societal impact assessment (of which a PIA would constitute only a portion).
- 3.7 It was suggested that a role for the Ethics Group would be ethical scrutiny of both the micro- and macro-level planning and to ensure that the HOB programme is based on a proper methodology. There would likely be significant difficulties in bringing the various modalities together onto one platform and work would be required to overcome these.
- 3.8 The Ethics Group had been provided with the opportunity to hold in depth conversations with policy about the ethical issues of a programme. It was agreed that a small working group should be set up in order to undertake a detailed examination of the issues and to report back to the Ethics Group. The point was raised that the working group would need to be a long standing group as the HOB programme would be an iterative process.

Action 1: Secretariat to coordinate the setup of the working group on the HOB programme.

Action 2: Barbara Prainsack to provide details of the Asset Tool to the Secretariat to be passed onto the working group and the HOB team in the Home Office.

¹ ASSERT tool – Assessing Security Research: Tool and Methodologies to measure societal impact. The tool has been developed by the Community Research and Development Information Service of the European Commission.

4.0 Discussion with Chief Constable Iain Spittal, Cleveland Police – NPCC lead for ethics.

- 4.1 The Chair introduced Chief Constable Iain Spittal from Cleveland Police Force, the National Police Chiefs Council's (NPCC) lead for ethics, who provided an outline of the ethical considerations which were taking place within the NPCC and the police forces. The aim was to prevent overlap with the work of the Ethics Group and to ensure that the work of both organisations was mutually supportive.
- 4.2 CC Iain Spittal explained that introducing a code of ethics into policing had been a major challenge. Until recently there had been no code of ethics in policing and police officers relied on their experience gained as serving officers in order to behave in an ethical and proportionate manner. This had raised questions amongst officers as to why an explicit code of ethics was required at this stage and whether it was as a result of the errors by a minority of police officers. CC Iain Spittal clarified that work was in progress to establish a professional body for policing and therefore a code of ethics, which lays out expectations and standards, was necessary. The hope would be to encourage critical thinking and restraint amongst the policing profession rather than hierarchical decision-making. Creating a culture where all levels of police officers can openly discuss issues was also considered important and Cleveland police had updated its recruitment procedures so that applicants were assessed in relation to their values rather than their competencies. In addition, the force were trying to embed a culture of learning from mistakes rather than punishment.
- 4.3 The Ethics Group heard that Cleveland police force had set up an internal ethics committee which met on a bimonthly basis and the police force was represented broadly on the committee. The committee examined past police decisions, reviewed future plans and considered specific ethical challenges. A further external ethics committee had been set up by Cleveland police force which included representatives from the community including the health service and academics, which met on a quarterly basis and debated wider ethical issues. In addition, work was in progress with the College of Policing to develop a national structure for ethics.
- 4.4 The Ethics Group highlighted that other public bodies had common values which the police profession could adopt and that most organisations complied with the Nolan principles². It was also suggested that it was important to distinguish between a code of ethics and a code of conduct and punishment and that this principle had been embedded within the health profession. It was noted that ethicists helped conceptualisation of issues. For example, focus groups in the health service discovered that the public were more concerned about the competence of health professionals rather than how respectfully they were treated by them.
- 4.7 It was agreed that the EG needed to continue to link in to the NPCC and College of

² Nolan Principles are the basis of the ethical standards expected of public office holder. They are also called the 7 principles of public life: <https://www.gov.uk/government/publications/the-7-principles-of-public-life>

Policing work to develop the national structure for police ethics procedures and to engage again in the future with CC Iain Spittal.

Action 3: Ethics Group to continue to engage with the NPCC and College of Policing to keep abreast of the developments for a national structure for ethics in policing.

5.0 Results from the Next Generation Sequencing stakeholder consultation

- 5.1 Members had been provided with a paper which gave an overview of the responses received to the Ethics Group stakeholder consultation on the ethical dimensions of next generation sequencing (NGS). Key suggestions and issues identified by the respondents to the consultation were highlighted in the paper. The Ethics Group were invited to consider the comments made by the respondents to the stakeholder consultation and in light of these responses determine whether changes should be made to the Ethics Group document. The Ethics Group was also invited to determine the next steps that it should take in the evaluation of NGS technologies and consider whether the EG should set up a working group to evaluate the ethical issues associated with the NGS technologies.
- 5.2 Responses to the final question in the consultation were considered enlightening, with broad support from respondents for the Ethics Group to develop a set of principles to guide its own ethical considerations. It was suggested that the Ethics Group should therefore pay careful consideration to this piece of work going forward. It had been recommended that the Ethics Group should seek input from the Genomic England Ethics Advisory Committee who were tasked with identifying ethical issues surrounding the use of NGS technologies in relation to the 100 genomes project.
- 5.3 The committee considered their next steps and the purpose of the ethical dimensions paper and whether the Ethics Group should focus on the technologies which are likely to require the highest level of ethical consideration, such as whole genome sequencing, or whether their focus should be on technologies which are most likely to be implemented in the near future. As the end user of the document produced, the National DNA Database Unit (NDU) representative suggested that the Ethics Group should consider the ethical issues in incremental stages and consider the changes which would be made to the DNA database in the immediate to medium term. The paper should be edited with the purpose of presenting it to the Strategy Board and the Home Office Biometrics (HOB) Programme. It was highlighted, that in general, respondents to the consultation were reasonably content with the paper and that it covered the area adequately.
- 5.4 Discussions were held about how the ethical dimensions table could be reorganised and members favoured the categorisation suggested by Illumina which included three phases of deliberation: (a) technologies which are being used in the present within forensic disciplines, (b) technologies which are applied within forensics but on ad-hoc case-by-case basis, and (c) technologies which are not being used in forensic discipline but have the potential to be applied. It was also suggested that

the questions posed in the previous version of the table should be re-written to make them more intuitive and accessible.

- 5.5 It was questioned whether a distinction should be made between technologies which are used on a case-by-case basis and technologies which employ the use of databases and datasets. It was thought that the arguments for both might be different and so they should be separated out.
- 5.6 Barbara Prainsack agreed to update the ethical dimensions paper and table to make it more accessible and then the document would be shared with the Strategy Board and the HOB programme and published on the Ethics Group website.

Action 4: Barbara Prainsack to update the ethical dimensions paper and table and the document to be shared with the Strategy Board and the HOB programme and published on the Ethics Group website.

6.0 Chair's update

- 6.1 The Chair updated the committee on discussions he had held with Gary Pugh, the Chair of the Strategy Board. The constitution of the Strategy Board had been discussed and there was a requirement for constant representation from the tripartite organisations: the National Police Chief's Council, the Home Office and the Association of Police and Crime Commissioners. Representative from these organisations should be of an appropriate seniority and have a sustained and constant presence on the board. The importance of slimming down the Strategy Board agenda had been discussed to allow the board to become more strategic. The Strategy Board was developing a forward work-plan of activities to ensure it had a thorough grasp of emerging issues. The work plan would allow the Ethics Group to provide more effective input to the Strategy Board.
- 6.2 Members heard that the expiry of their tenures were not currently aligned and individual membership on the group expired over a range of dates between January and July 2017. Members were asked for their agreement for the Secretariat to extend their tenures so that they all expired in July 2017. This would facilitate the appointments process in the future and prevent the requirement for multiple recruitment campaigns over a series of months. Members all agreed for their tenures to be extend to July 2017 and were informed that the process would begin soon.
- 6.3 Members were also asked to indicate whether they would be willing to consider potential reappointment for a period between eighteen months and three years should the Minister consider this an appropriate course of action. Members all agreed that they were willing to be considered for potential reappointment. In addition, the Home Office would shortly commence an open recruitment campaign to appoint new members to the Ethics Group with the intention that around half of the current members would be reappointed and half of the committee would be constituted of new members.

7.0 Principles for Ethical Assessments

- 7.1 The Ethics Group agreed to develop a set of broad ethical principles to guide its own considerations and to guide others who are minded to develop or who are considering new developments in the areas of forensics and biometrics. Jennifer Temkin will lead on the development of the principles along with Carol Moore and Barbara Prainsack. The working group will report back to the Ethics Group on their work at the February 2017 meeting.

Action 5: Jenifer Temkin, Carol Moore and Barbara Prainsack to develop a set of broad ethical principles and report back to the Ethics Group in February 2017.

8.0 Counter Terrorism DNA Database

- 8.1 The Chair introduced a paper and reminded the Ethics Group that it had made two recommendations in this area:
- the benefits of an independent audit and scrutiny of the Counter Terrorism DNA database (CTDNAD) should be explored by the Home Office and the Metropolitan Police;
 - all databases containing DNA information, including the CTDNAD, held by the police service, should be subject to a robust statutory governance framework, appropriate systems and controls, and should be transparent and only be used for statutory purposes.
- 8.2 The Biometrics Commissioner (BC) outlined an issue with the national Counter Terrorism (CT) databases, including the CTDNAD, which the previous BC had identified. Members heard that following the implementation of the Protection of Freedoms Act (PoFA) in 2012, DNA profiles of individuals who had not been convicted of a notifiable offence could only continue to be held on the CTDNAD, if a National Security Determination (NSD) had been undertaken. A transitional period of 2 years was given in order for police to review their holdings on the CT databases. There had been delays putting NSDs in place and consequently the Minister had given police forces an extension until October 2016 for NSDs to be put in place in respect of police holdings of biometric material (DNA and fingerprints) for un-convicted individuals currently held on the national CT databases. The process for making NSDs was outlined. NSDs were made by a Chief Officer of police, that is an officer of ACPO/NPCC rank. The BC does not make the decision anew. The BC reviews and assesses each NSD made by a Chief Officer and determines whether sufficient information has been provided to determine whether the Chief Officer's decision is reasonable and proportionate. The BC explained that he had the power to order the destruction of a DNA profile on the CTDNAD but would first allow the chief police officer to provide additional information to support the NSD. The BC informed the Ethics Group that he would like to review this process and put the onus on chief police officers to provide all necessary evidence up front to support their NSD determination. The Ethics Group heard that the precise figures of the

number of applications which the BC had rejected would be made available in the next BC annual report. NSDs were time-limited and after 2 years the DNA profile and/or fingerprints must either be destroyed or a further NSD would need to be approved.

- 8.3 The BC explained once the backlog of NSDs had been processed, the BC would turn his attention to the governance of the national CT databases. Ethics Group members noted that given the current opacity of the existing governance arrangements it was difficult to provide assurance that procedures were being conducted appropriately. The issues highlighted in relation to the NSDs provided evidence that procedures had not been put in place in a timely fashion. It was explained that the issues in relation to putting the NSDs in place, were due to the new PoFA legislation coming into force and when the new legislation had come into effect it had been necessary to determine whether existing profiles and fingerprints should continue to be held on the national CT databases.
- 8.4 The Ethics Group queried how the BC could be assured that the profiles relating to the NSD applications which were rejected, were actually destroyed. The Ethics Group heard that IT systems were in operation to ensure profiles were destroyed and that part of the BC's role was to have oversight of the IT systems which were in place. In addition, the Commissioner's Office receive regular performance updates from CT Policing and Forensic Services.
- 8.5 It was noted that the Ethics Group do not currently have a responsibility within its terms of reference in respect to oversight of the national CT databases. However, the interaction between the CTDNAD and other databases, would fall within the remit of the Ethics Group. The Ethics Group inquired whether the Chair could play a role in supporting the BC in providing oversight to the governance of the CTDNAD. The BC agreed to consider this suggestion and respond to the Ethics Group.

Action 6: Biometrics Commissioner to consider whether the chair of the Ethics Group can play a role in supporting the BC to provide oversight to the governance of the CTDNAD.

9.0 DNA Database Delivery Unit update & discussion on the new familial searching policy for the NDNAD

- 9.1 The Ethics Group heard that the next meeting of the Strategy Board would be 27 September, with a strategic agenda which focused on risks and performance of both the DNA and fingerprints databases. Other substantive items that would be discussed included the HOB programme and the work-plan of how the databases needed to look by 2020. Other projects included whether a centralised database for Y-STRs should be established and the work to develop a Central Elimination Database (CED).
- 9.2 Stage 1 of the HOB programme would be the establishment of a CED which is held on a separate server to the National DNA Database (NDNAD). Consideration of the strategic solution includes whether the CED is a different application as the NDNAD but with the same infrastructure. Steady progress had been made with adding scene of crime officers and police staff who come into contact with crime scene

exhibits to the CED. In addition, responses had been received back from most manufacturers of DNA consumables as to whether they would be willing for staff to be included on the CED. There was on-going work with Sexual Assault Referral Centres (SARCs) to take elimination samples from staff and there were a number of issues with SARCs in relation to applying forensic standards but also ensuring that their work was aligned to NHS business requirements.

- 9.3 The Ethics Group heard that the work on evaluating the risks to the supply chain had paused in order for an understanding to be attained as to what would be the correct metrics to gather from an operational policing point of view. As part of this work, the Ethics group were informed that the NDU would be meeting with the UK Accreditation Service (UKAS) and the Forensic Science Regulator (FSR) to look at the performance of Forensic Science Providers (FSPs) and the evolution of the entire process.
- 9.4 The Ethics Group had responded to the NDUs consultation on its new familial searching policy which provided a framework for carrying out familial searching on the NDNAD. The Ethics Group had inquired whether familial searching would no longer require approval by the Strategy Board once the policy was implemented. It was clarified that if a request met the rules of the policy then it would not need approval by the Strategy Board however the NDU would assess each request received to ensure compliance. Exceptional cases were discussed and these were likely to be requests for searches using partial profiles. Exceptional cases would be assessed on the basis of their merits using the principles of the policy as to whether the search would be appropriate and proportionate. If the NDU thought that the search would be pushing the boundaries of the policy from an ethical view-point then the Ethics Group and Biometrics Commissioner would be asked whether the search would be proportionate.
- 9.5 Members of the Ethics Group stressed that in relation to exceptional cases it was important to clarify the principles that would be applied when these cases were assessed and whether the police forces would provide sufficient information to allow for the legal, ethical and moral basis of the search to be undertaken. It was suggested that the principles that should be applied to exceptional cases ought to be determined and at least two individuals should independently apply these principles to each exceptional case.

10.0 Forensic Science Regulator update

- 10.1 The following updates from the Forensic Science Regulator (FSR) were provided for the EG. A specialist working group on Y-STR DNA analysis would meet the following week. A Y-STR quality assessment document had been produced and the FSR was grateful to the Ethics Group for their advice on this document.
- 10.2 The Regulator had recently commissioned three pieces of work: a DNA mixture interpretation software validation standard and guidance, presentation of qualitative opinions of evidential weight in relation to complex mixtures and the formulation of propositions in the evaluation of DNA mixtures. The draft of the DNA mixture interpretation software validation standard and guidance had been reviewed by the

FSR's Forensic Science Advisory Council (FSAC) and the EG were also invited to review the guidance.

Action 7: Kit Harling to review the FSR DNA mixture interpretation software validation standard and guidance and feedback to the Regulator.

- 10.3 A draft of the qualitative opinions of evidential weight in relation to complex mixtures was almost complete with outstanding considerations taking place as to whether the standard should permit forensic experts to provide qualitative opinions of a mixture in court, when a statistical analysis either had not or could not be undertaken.

Action 8: David Latchman to review the DNA mixture interpretation guidance when complete and feedback to the Regulator.

- 10.4 The FSR had published interim Sexual Assault Referral Centre (SARC) guidance, which dealt in particular with contamination issues in SARCs. Issues had arisen in SARCs with examiners being asked to examine multiple suspects or victims within a case which increased the likelihood of cross-contamination. The guidance would recommend that this should only happen in exceptional cases. The FSR had completed an investigation of a SARC contamination incident and made recommendations. The SARC had accordingly implemented more robust procedures and subsequently reopened. The FSR would adapt the report of the contamination incident into a learning report to assist SARCs with improved procedures.
- 10.6 The Regulator had undertaken a pilot study of rape cases to consider whether cases brought to the Regulators attention were representative of issues on a larger scale that may impact on the quality of forensic science provided to the CJS. The report had been drafted and would be published by the Regulator in the near future. It considered potential gaps in forensic evidence when transferred from police forces to FSPs.
- 10.7 A consultation had been undertaken on a fingerprint enhancement standard. The updated document would be published and shared with the Ethics Group when complete.
- 10.8 The Regulator had written to the HOB programme on the validation of fingerprint software. Assurances had been sought from the HOB programme that the next generation fingerprint algorithms provided by the Home Office would not create a barrier to police forces achieving accreditation to ISO 17025.
- 10.9 The Ethics Group were informed about a report which would be published by the US President's Council of Advisors on Science and Technology on Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods. The report would review comparison forensic evidence such as fingerprints, ballistics, footwear and bite marks. It was noted that some of the criticisms highlighted in the report would not apply to the UK processes. The report would be circulated when published.

Action 9: Secretariat to circulate the US President's Council of Advisors on

**Science and Technology report on Forensic Science in Criminal Courts:
Ensuring Scientific Validity of Feature-Comparison Methods, when published.**

11.0 AOB

- 11.1 The Chair thanked those who had taken on responsibility for pieces of work on behalf of the Ethics Group. The date of next meeting would be Tuesday 6 December 2016.

Annex A

Attendees

Chris Hughes	Chair
Adil Akram	Member
Alan Clamp	Member
Nina Hallowell	Member
Kit Harling	Member
David Latchman	Member
Carole Moore	Member
Isabel Nisbet	Member
Barbara Prainsack	Member
Jennifer Temkin	Member

Apologies

No apologies

In attendance

Emma Burton-Graham	NDNAD EG Secretary
Wendy DuChesne	Home Office Biometrics Programme
Carrie Golding	Home Office Biometrics Programme
June Guinness	Forensic Science Regulation Unit, Home Office
Gemma Gyles	Biometrics Commissioner's Office
CC Iain Spittal	Cleveland Police
Mike Taylor	NDNAD EG Secretariat
Jo Wallace	Head of the Science Secretariat, Home Office
Paul Wiles	Biometrics Commissioner

Annex B:**GLOSSARY OF TERMS**

Biometric Information	Information about an individual's physical characteristics such as fingerprints or eye colour, which are distinctive and measureable.
Biometrics Commissioner	Independently appointed post to provide oversight of the regime established by the Protection of Freedoms Act to govern the retention and use by the police in England and Wales of DNA samples, DNA profiles and fingerprints. The post has a UK-wide oversight function as regards their retention and use by the police on national security grounds.
Central Elimination DNA Database (CED)	A centrally held database of DNA profiles taken from individuals who are involved in a role where there is a increased risk that they may inadvertently contaminate a sample taken from a crime scene with their own DNA, such as manufacturing or laboratory staff, crime scene officers and police personnel.
College of Policing	The professional body for policing which operates in the public interest to find the best ways to deliver policing and support for the police service.
Counter Terrorism (CT) DNA Database	A DNA database operated by the Metropolitan Police Service which contains the DNA profiles obtained through searches, crime scenes and arrests in relation to counter terrorism.
Crime Scene Stain	Biological material recovered from the scene of a crime from which DNA may be able to be extracted.
Criminal Justice Sample	A sample of DNA obtained compulsorily from people arrested by the police for a recordable offence under the provisions of the Police and Criminal Evidence Act 1984.
Crown Prosecution Service (CPS)	Established in 1986, it prosecutes criminal cases investigated by the police in England and Wales. It advises police, reviews cases submitted by the police and prepares and presents papers for cases in court.
Custody Images Review (CIR)	Review by the Home Office to consider proportionality of the use and retention of images on a national database.
Dactyloscopy	The method of ridge analysis in human skin (typically fingers and palms) [<i>See also Fingerprints</i>]
Data Linkage	A process which brings together two or more sets of data from different databases, organisations or countries to enhance the information that can be obtained from the data (e.g. by combining different datasets, new patterns may become apparent)
Deoxyribonucleic Acid (DNA)	The chemical in the cells of an organism that carries that organism's heritable material used in the development, functioning and reproduction of all known living

	organisms. DNA is a nucleic acid and consists of two strands coiled around each other to form a DNA double helix. Each DNA strand is composed of smaller units called nucleotides and the sequence of these nucleotides encodes biological information.
DNA Profile	A numerical representation of the characteristics of certain sections of (typically non-coding) DNA obtained following the analysis of a DNA sample which can be uploaded to a database and compared with other DNA profiles.
DNA 17 Profile	A profile produced using the latest system of DNA profiling technology which examines 16 sections of DNA, plus a gender marker to produce a numerical DNA profile that can be loaded onto the National DNA Database. The methodology used creates greater discrimination between profiles than the previous SGM + methodology and reduces the probability of chance matches between individuals.
Elimination DNA sample	A DNA sample taken from an individual and used to create a DNA profile in order for that individual to be eliminated as the source of a sample found at a crime scene <i>[see also Central Elimination DNA Database]</i>
Epigenetics	This is the study of (partly heritable) changes in gene expression due to external or environmental factors that affect how genes are read, rather than changes in the underlying DNA sequence.
Facial Recognition System	A computer application capable of identifying or verifying a person from a digital image or a video source by comparing selected facial features from the image with those on a facial database.
Familial Searching	Involves searching the database for DNA profiles that do not match fully to a comparison profile, but where an unusually high number of loci match. This could indicate a biological relationship such as parent, child, sibling, cousin, uncle etc.
Fingerprints	The impression left by the epidermal ridges in a human finger. The print consists of a mixture of sweat and skin cells. <i>[See also Dactyloscopy]</i>
Forensic Science Regulator (FSR)	Ensures that the provision of forensic services across the criminal justice system is subject to an appropriate regime of scientific quality standards. The FSR works with the Home Office.
International Standards Organisation (ISO)	Is an independent, non-governmental international organisation. It brings together experts to share knowledge and develop international standards that are voluntary, consensus-based and market relevant.

Low copy number (LCN)	A modified version of DNA profiling that is performed when the amount of DNA recovered from a biological sample is very limited. The number of PCR cycles is increased compared to standard SGM plus, which enhances the sensitivity of the technique and improves the likelihood of detecting DNA.
Random Match Probability	The probability that a DNA profile matches a randomly drawn person from the general population. If the random match probability is high, then any suspected link between the DNA and a person needs to be treated with caution.
Metagenomics	Is the study of the diversity of species in a microbial sample which has been recovered from the environment. It allows the study of all genes in all organisms which are present in a given complex sample.
Mixed DNA Profile	A profile where DNA from more than one individual is present. A mixed DNA profile is evident when more than two copies of DNA are observed at a region. <i>[See also DNA profile]</i>
National Crime Agency	Leads the UK law enforcement's fight to cut serious and organised crime. It has national and international reach and the mandate to work in partnership with other law enforcement organisations to tackle serious and organised criminals.
National DNA Database (NDNAD)	Established in 1995, it is an electronic, centralised database holding the DNA profiles taken from both individuals and crime scenes. The database can be searched to provide police with a match linking an individual to a crime scene and <i>vice versa</i> .
National DNA Database Delivery Unit (NDU)	A department within the Home Office responsible for overseeing the running of the National DNA Database.
National DNA Database Strategy Board (NDNAD SB)	A board comprising representatives from NPCC the Home Office, the DNA Ethics Group and the Forensic Science Regulator as well as representatives from other bodies that provides governance and oversight for the operation of the NDNAD.
National Police Chiefs Council (NPCC)	The NPCC bring together the 43 operationally independent and locally accountable chief constables and their chief officer teams to coordinate national operational policing. They work closely with the College of Policing.
Next Generation Sequencing (NGS) or Massive Parallel Sequencing (MPS)	This is the terms used to describe a number of high throughput approaches to DNA sequencing that allow the sequencing of DNA much more rapidly and cheaper than previously.

ParaDNA® Instrument	An instrument that can be used at a crime scene and is able to produce a DNA profile from a sample within 75 minutes. ParaDNA® profiles include 5 STRs and a gender test and therefore the discrimination power provided from these profiles are much less than obtained from full SGM+ and DNA17 profiles. <i>[See also Rapid DNA Technology]</i>
Partial DNA Profile	This is the term used to describe a profile when results have been obtained at some but not all of the sections of DNA which were analysed. Partial profiles are often obtained from samples recovered from crime scenes as the DNA may have been subject to conditions which have degraded it, which means that not all regions of DNA of interest are intact.
Phenotype	The physical manifestation of an individual's genotype combined with the effects of exposure to environmental factors (e.g. the hair colour, facial features, or personality traits of a person)
Phenotypic profiling	The use of DNA analysis in order to obtain information about externally visible traits, and/or the likely ethnic background, of a person. The information cannot be obtained from traditional STR profiles but requires a special type of analysis.
Protection of Freedoms Act (PoFA)	An Act of Parliament of the UK which was introduced by the Home Secretary in 2011 and sponsored by the Home Office. In May 2012 the Bill completed its passage through Parliament and received Royal Assent.
Prüm Agreement/ Convention	A convention signed in May 2005 by Austria, Belgium, France, Germany, Luxemburg, the Netherlands and Spain and is open to all members of Europe and enables the signatories to be able to exchange data regarding DNA, fingerprints and vehicle registrations of persons suspected to be co-operating in terrorism, cross-border crime and illegal migration.
Rapid DNA Technology	Technology which has the ability to produce a DNA profile much faster than can be done using conventional technology and is also portable.
S and Marper	This refers to a case where S joined with Marper to bring a case to the European Court of Human Rights after their applications to the English courts had failed. They objected to the retention by the police of their DNA samples, profiles and fingerprints as they had not been convicted of any offence. The police were entitled to retain them under the law then in force. S and Marper relied principally on Section 8 of the European Convention of Human Rights which protects the right to privacy. The Court found in their favour. It held that the margin of appreciation had been exceeded and their right to privacy had been infringed. This decision led eventually to the passing of the Protection of Freedoms

	Act 2012 which changed the law on the retention of samples, profiles and fingerprints. This in turn led to the removal of millions of profiles from the National DNA Database.
Second generation multiplex (SGM, SGM+)	A system of DNA profiling which was used in the UK until July 2014 which examines 10 sections of DNA plus a gender marker to produce a numerical DNA profile that can be loaded onto the National DNA Database. At each of the 10 areas an individual has two copies of DNA, one inherited from each of their parents.
Short Tandem Repeat (STR)	Sections of DNA dispersed within coding and non-coding regions of the human genome that contain hundreds of repeats of a short sequence of DNA (2-6 nucleotides). Different people have different numbers of repeats and when a number of regions are analysed, the chance of two people having the same number of repeats at all loci is small. This is the underlying principle of DNA profiling.
Single Nucleotide Polymorphism (also referred to as SNPs – pronounced “snips”)	This is a variation at the level of single nucleotide bases that occurs at a specific position in a sequence of DNA.
United Kingdom Accreditation Service (UKAS)	Is the national accreditation body for the UK and is recognised by government to assess against internationally agreed standards, organisations that provide certification, testing, inspection and calibration services.
Y-STR profile	See <i>STR profile</i> but restricted to regions found only on the Y-chromosome (which is only present in males).