



# Biometrics and Forensics Ethics Group

Annual Report  
2020 – 2021

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## Chair's introduction

This is my second annual report as Chair of the Biometrics and Forensics Ethics Group (BFEG) in what has been a challenging year for us all. I must thank the members for maintaining their high levels of engagement, persevering with technical challenges, and continuing to deliver high quality advice, including the publication of three excellent reports, whilst working remotely.

In September 2020, we published our report on the feasibility of using [genetic genealogy](#) resources for the investigation of crime in the UK. This detailed report has been well received and ethical considerations in genetic genealogy, [biogeographical ancestry](#), and [phenotype](#) prediction techniques remains an area of focus for the BFEG.



Over this reporting period we have also updated our set of high-level governing principles, first published in 2018. The update was in response to a strong sense within the BFEG that consideration of issues of discrimination and disadvantage should be explicitly stated. The updated principles make plain that biometric, forensic, and data analysis procedures should not deliberately or inadvertently target or selectively disadvantage individuals or groups on the basis of their 'protected characteristics' under the Equality Act 2010. The update also highlights that procedures need to be mindful of the evolving position on individual human rights under the Human Rights Act 1998.

In January 2021, the BFEG also published a briefing note on the ethical issues arising from public-private collaboration in the use of [live facial recognition](#) (LFR) technology. This note drew on evidence gathered from stakeholders in industry, regulation, civil liberties, and policing. The note highlighted questions that should be addressed prior to setting up public-private collaborations and set out recommendations for those involved in such collaborations.

The coming year will also see the continued work of two new groups that were established to address the 2020/2021 commission; the Data Ethics Advisory Group has been providing guidance and support to teams working on projects using large data sets, and the Biometrics and Digital Forensics Working Group has been supporting colleagues in the Data and Identity policy group in addressing ethical issues in the forensic examination of digital devices.

Over the coming year I also look forward to working closely with the new [Biometrics and Surveillance Camera Commissioner](#), Professor Sampson, and developing a strong working relationship between his office and the BFEG.

The BFEG continues to grow and in March 2021 I was pleased to retain seven excellent members of the group who were all successfully reappointed for a second term. The summer of 2021 will sadly see the conclusion of the final terms of three committed and highly engaged members and, in March 2021, a recruitment competition for new members was launched. I have been impressed by the number and calibre of applicants and look forward to welcoming new members following conclusion of the competition later in 2021.

A handwritten signature in black ink that reads "Mark Watson-Gandy". The signature is written in a cursive, slightly slanted style. Below the signature is a short horizontal line.

Professor Mark Watson-Gandy  
Chair, Biometrics and Forensics Ethics Group

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## What we do

The Biometrics and Forensics Ethics Group (BFEG) is an advisory non-departmental public body sponsored by the Home Office. It provides independent ethical advice on issues related to the collection, use, and retention of biometric and forensic material and on the use of large and complex datasets and projects using [artificial intelligence](#).

The BFEG is commissioned to consider the ethical impact on society, groups, and individuals from:

- the use of large datasets within the Home Office, including the implementation of systems using [machine learning](#) and [artificial intelligence](#);
- the collection, retention and use of human biometric identifiers, such as DNA, fingerprints, and [facial recognition](#);
- the retention and use of forensic data such as extracted [digital forensic material](#);
- policy and projects from the [Forensic Information Databases Strategy Board](#); and
- relevant projects from the [Home Office Biometrics programme](#), including advice on [Data Protection Impact Assessments](#).

The BFEG also considers:

- issues raised by key stakeholders such as the [Forensic Information Databases Strategy Board](#), the [Biometrics Commissioner](#), and the [Forensic Science Regulator](#); and
- issues raised by members of the BFEG as part of its self-commissioned work (roughly 30%).

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## 2020/2021 Commission

In May 2020 the Biometrics and Forensics Ethics Group (BFEG) was asked to organise working groups around the following three themes.

### **Home Office Biometrics programme**

The [Home Office Biometrics](#) (HOB) programme Ethics Working Group was asked to continue to advise the [HOB programme](#) and related Home Office initiatives on projects at an early stage of their development. The group was also asked to continue to advise on HOB [Data Protection Impact Assessments](#).

### **Use of large and complex datasets**

The Complex Datasets Working Group was asked to continue to advise projects considering the adoption and/or use of explainable data-driven technology and contribute to guidance being developed for data scientists. The group was also asked to feed into a process for ethical consideration of emerging Home Office projects utilising [machine learning](#), and input into a discipline-specific ethics framework for use by those commissioning, designing, and using machine learning applications.

The BFEG was asked to utilise the work under way to review and update the data ethics framework from the Department for Digital, Culture, Media and Sport, and develop a data ethics advisory service providing ethical guidance and support for Home Office projects. The BFEG was asked to work with the Home Office to define the terms of service for an advisory service

and work through several use cases to test the proposed process (such as the amalgamation and use of data from a range of sources).

Once fully established, the Home Office would look to the BFEG to provide input into the development of further discipline-specific ethics guidance and procedures.

### **Biometrics and forensics access and retention**

The BFEG was asked to advise on approaches to the collection, use, retention and deletion of different biometrics and of extracted [digital forensic material](#).

The group was also asked to advise on ethical issues regarding the use of extracted information obtained through digital forensics investigations in large datasets for the purposes of data-driven policing and/or the training of algorithms to improve digital forensics tools.

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## Overview of activities

### **Demission**

In March 2021, following a period of co-option to the Biometrics and Forensics Ethics Group (BFEG), long-standing BFEG member, Professor Nina Hallowell, concluded her final term with the group. A committed and valued member of the BFEG for ten years and Chair of the Facial Recognition Working Group, Professor Hallowell had driven the delivery of two reports on the ethical use of [live facial recognition](#) (LFR):

- *[ethical issues arising from the police use of LFR technology; and](#)*
- *[a briefing note on the ethical issues arising from public-private collaboration in the use of LFR technology](#)*.

### **Appointments**

In March 2021 a recruitment competition was launched for five additional members of the BFEG.

The vacancies had arisen from the resignation of Dame Sue Black in 2020, the completion of Professor Nina Hallowell's final term and the pending completion of final terms for Dr Adil Akram, Isabel Nisbet, and Professor Jennifer Temkin in July 2021.

Recruitment targeted the following areas of expertise to support the commission of the BFEG:

- the law, with experience in relevant areas such as criminal law, forensic science, biometrics, and data;
- social sciences, with experience of considering the social and ethical implications of technological innovations, such as in forensics, biometrics or use of data;
- data ethics, with experience of considering the issues in the use of large data sets across the biometric, forensic and criminal justice arena or other relevant fields; and
- digital forensics with experience of working with large volumes of digital data for forensic analysis.

The vacancies were advertised by Public Appointments and the recruitment competition was expected to conclude in autumn 2021.

## Meetings

The BFEG has held four full committee meetings in the period covered by this annual report. The [minutes of these meetings](#) are publicly available on the BFEG gov.uk website.

## Speakers

The BFEG welcomes external speakers to maintain a broad and up-to-date understanding of the ethical issues in forensics, biometrics and the use of data-driven technologies.

Individuals or organisations with a relevant topic for discussion at a BFEG meeting would be welcome to contact the BFEG secretariat at: [BFEG@homeoffice.gov.uk](mailto:BFEG@homeoffice.gov.uk).

At the [September 2020 meeting](#) the BFEG heard from Gareth Davies from the University of South Wales, and John Beckwith from Transforming Forensics (TF) on the approaches to the collection, use, retention, and deletion of extracted [digital forensic material](#). This presentation provided background information for the commissioned work on biometrics and forensics access and retention.

## Working group meetings

In 2020/2021 the sub-groups of the BFEG also met virtually to progress their individual areas of work. The Home Office Biometrics Programme Ethics Working Group, the Data Ethics Advisory Group, and Biometrics and Digital Forensics Working Group each met on three occasions. The Complex Datasets Working Group met on four occasions and the Facial Recognition Working Group met on ten occasions. The activities of the working groups are reported to the BFEG at the quarterly meetings and reflected in the minutes of those meetings.

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## Stakeholder engagements

The BFEG routinely provides advice and guidance to the [Forensic Information Databases Strategy Board \(FIND SB\)](#), and to the [Home Office Biometrics \(HOB\)](#) programme. The BFEG also provides advice as required for other relevant departments in the Home Office.

### Forensic Information Databases Strategy Board

The FIND SB provides governance and oversight over the operation of the [National DNA Database \(NDNAD\)](#) and the National Fingerprint Database. In the 2020/2021 reporting period the BFEG was asked to advise on ethical issues arising in connection with the [Forensic Information Database Services \(FINDS\)](#) business on the following three topics.

### Genetic genealogy

Our previous annual report recorded that the BFEG was asked by FIND SB to consider whether the use of genealogical databases for law enforcement purposes would be possible or acceptable in the UK. A report was produced for the board by BFEG members Denise Syndercombe Court and Mark Jobling. In September 2020 the BFEG published a report on [the feasibility of using genetic genealogy methods to assist in solving crime in the UK](#). This report included background information on how [genetic genealogy](#) works, and how it had been used to identify suspects in criminal cases outside the UK. The technical and economic challenges were considered, and the use of the method compared with traditional [familial searching](#). As most use of genetic genealogy by law enforcement had been in the USA, the report addressed the feasibility and necessity of using such methods in the UK.

## Familial DNA

Familial DNA analysis involves searching a [DNA profile](#) from an unknown individual against the NDNAD for profiles that may have come from a close relative. As half a person's DNA is inherited from the mother and half from the father, relatives such as parents, children and siblings are expected to share a predictable proportion of their DNA.

Familial DNA searches are performed by forensic service providers (FSPs) using search algorithms. These algorithms were designed for the SGMP $_{us}$  set of 10 [short tandem repeat](#) (STR) markers, which are a subset of the 16 markers currently used to populate the NDNAD. Therefore, there would be no comparison of profiles against the full 16-STR DNA profiles (known as [DNA-17](#)) held on the NDNAD.

The BFEG was asked to consider a proposal from [FINDS](#) to allow profiles where a match was generated using the familial DNA algorithm to be released to the relevant FSP for comparison of the complete set of DNA markers.

The BFEG supported the proposal and noted that this would make familial DNA searches more effective. However, the BFEG wished to note:

- the lack of oversight of the algorithms used by the FSPs;
- that the new method should ensure increased efficiency and a reduction in false positives; and
- that a review of the number of false positives resulting from the use of the additional markers should be considered – this would need to be by geographical area as searches were restricted to specific crime-relevant geographical areas.

## Vulnerable Persons DNA Database

The [Vulnerable Persons' DNA Database](#) (VPDD) was established to hold DNA profiles from vulnerable persons and individuals who are considered vulnerable by a parent, guardian or appropriate adult, and are at some risk of harm and/or going missing.

Law enforcement agencies (LEAs) monitor these individuals, and if intelligence suggests that an individual may have come to harm, the LEA can request that the individual's DNA profile is searched against the NDNAD and, if necessary, against the Missing Persons' DNA Database. VPDD profiles would not be routinely searched against these databases and [FINDS](#) had identified a risk that matches may be missed if the LEA was unaware that an individual may have come to harm.

A change in the process was proposed to allow routine searching of VPDD profiles against DNA profiles from unidentified bodies/part(s), and crime scenes (trophies from potential victims of known serial killers or 'no body' murders). This would require a change to the VPDD consent form.

The BFEG identified readability and clarity issues with the consent form provided with the Vulnerable Persons' DNA sample kit. Further details of the recommended changes can be found in the [minutes of the March 2021 meeting](#) and in the recommendations section at the end of this report. Work on this form continues with FINDS to ensure that informed consent can be given and that the process for requesting removal of a profile from the VPDD is clearly explained.

As a result of identifying the need for changes to the VPDD consent form the BFEG will look to extend this learning to other DNA sample consent forms. The BFEG will seek to feed into the Forensic Capability Network review of:

- the DNA sample collection kits used when taking DNA samples under the Police and Criminal Evidence Act 1984; and
- victim [elimination DNA samples](#).

### **Biometrics Commissioner**

In December 2020, following an extension, Professor Paul Wiles concluded his term as the Biometrics Commissioner and produced an [interim report](#) to cover developments since his 2019/2020 Annual Report.

On the 1<sup>st</sup> of March 2021 the Home Office appointed Professor Fraser Sampson as the Government's new independent [Biometrics and Surveillance Camera Commissioner](#).

Professor Sampson's portfolio combines the posts of the Commissioner for the Retention and Use of Biometric Material and the Surveillance Camera Commissioner, which were previously both part-time. The statutory responsibilities and duties for both roles remain the same.

Professor Sampson spoke to the BFEG's [quarterly meeting in March 2021](#) and the group looks forward to working with the Commissioner and his Office.

### **Forensic Science Regulator**

In February 2021, following a three-month extension, Dr Gill Tully concluded her term as the [Forensic Science Regulator](#) (FSR) and on the 16<sup>th</sup> of May 2021, Gary Pugh was appointed as the new Forensic Science Regulator.

### **Guidance document review**

In February 2021 the BFEG provided an ethical review of specific sections within two FSR guidance documents. These documents on [relationship testing](#) and [Y-STR profiling](#) were subsequently published in March 2021:

- *DNA Relationship testing using Autosomal Short Tandem Repeats* ([FSR-G-228](#)); and
- *Y-STR Profiling* ([FSR-G-227](#)).

### **Data and Identity Department – policy**

In addition to the commissioned work, the BFEG may also provide advice to policy colleagues on an ad hoc basis.

### **Custody images leaflet**

Following a recommendation made in the BFEG's previous annual report, a leaflet had been produced for arrestees that explained:

- the process of retaining custody images;
- people's rights; and
- how to request deletion of images held on police systems.

A draft leaflet had been produced by the Home Office, in discussion with operational policing contacts, and views on the leaflet were sought from BFEG members before this leaflet was sent for formal agreement at the senior National Police Chiefs' Council level.

Improvements to the leaflet were identified. These included improving readability, as the leaflet should be understandable to a wide range of people and appropriate to the intended audience. The leaflet should also provide clarity over tattoo images, and whether deletion of these images would be covered in the same way as facial images. The BFEG recommended that the leaflet included:

- more details and examples of the evidence that would support retention of images;
- the exceptional reasons for retaining an image; and



- whether justification of image retention would be provided to the arrestee.

The views from the BFEG were incorporated into the final leaflet, which should be produced pending agreement by police governance bodies.

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## Other engagements

### Home Office Biometrics programme

At the [December 2020 meeting](#) the Biometrics and Forensics Ethics Group (BFEG) heard from the [Home Office Biometrics](#) (HOB) programme representative on work that the HOB programme was undertaking to understand the potential for bias in the use of face algorithms.

The BFEG was supportive of this and a group of members were identified to provide advice and guidance to the HOB programme during the development and execution of this work.

### Forensic Capability Network

At the [March 2021 meeting](#) the BFEG heard from a representative from the Forensic Capability Network (FCN) on the draft FCN Forensic Science Code of Ethics. The FCN Code of Ethics was intended to complement the existing [College of Policing Code of Ethics](#) and had been created specifically to consider research and forensic activity. The BFEG reviewed the draft Code and identified aspects for clarification.

### Science, Technology, Analysis and Research Oversight Police Sub-Board

The Science, Technology, Analysis and Research (STAR) Oversight Police Sub-Board provides oversight and scrutiny of ongoing and planned STAR activity within the policing sector.

A representative of the BFEG attended the meeting of this Board in July 2020 and provided ethical considerations on bids for research funding.

### Office for Data Communications Authorisations

The Office for Data Communications Authorisations (OCDA) was established in 2019 to consider requests from police forces and other public authorities for communications data. Communications data are the ‘who’, ‘where’, ‘when’ and ‘how’ of a communication, but not its content.

The BFEG was asked to carry out an independent review of the OCDA Authorising Officer training material to support the ongoing development of the material and provide guidance on the consideration of ethical issues. A paper-based review of the training material was carried out and a report provided to the OCDA.

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## Communications

### Freedom of Information Act requests

The Biometrics and Forensics Ethics Group (BFEG) received ten requests for information under the Freedom of Information Act.

## Website activity

Details of the work of the BFEG can be found on its [gov.uk website](#). This website was viewed 2,037 times (1,547 unique views) between May 2020 and April 2021.

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## Budget and expenditure

The Biometrics and Forensics Ethics Group's (BFEG's) members are unremunerated for their work but receive reasonable travel and overnight expenses. Given the move to online meetings as a result of the COVID-19 pandemic there were no expenses from hosting meetings. Over the reporting period a recruitment competition for five new members was launched, for which costs were incurred.

BFEG expenditure for May 2020 to April 2021 is shown in Table 1.

**Table 1: BFEG expenditure May 2020 to April 2021**

Expense	Cost
Recruitment	£1368.00
Members' expenses	£0
External venue hire	£0
Secretariat expenses	£36.48
Food	£0
Total	£1,404.48

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## Progress on commissioned work

### Home Office Biometrics programme

Over the past year the Home Office Biometrics Ethics Working Group (HOB EWG) has continued to receive updates on the HOB programme and provided ethical advice on [Data Protection Impact Assessments](#) (DPIAs) for the programme. The working group also fed into the update of the Home Office DPIA template by the Office of the Data Protection Officer (ODPO).

The views of the working group and the wider Biometrics and Forensics Ethics Group (BFEG) were sought on some work that HOB has been doing to understand the potential for bias in the use of face algorithms. A group of BFEG members will continue to advise on this work as it develops.

The HOB programme is expected to run until at least March 2022. Over the coming year the group will continue to provide ethical advice on existing HOB projects and projects/developments that are at the demand register stage, following a change this year to provide ethical advice at an earlier stage. As the HOB programme transitions to a product delivery approach during 2021/2022 the views of the HOB EWG will likely be sought on how ethics should remain a key consideration in the product structure.

## Use of large and complex datasets

- a. Advise projects considering the adoption and/or use of explainable data-driven technology and contribute to guidance being developed for data scientists.

In November 2020 the Complex Datasets Working Group (CDWG) reported to Data Services and Analytics (DSA) on the ethical considerations for two Home Office data science applications.

The CDWG continues to provide advice and guidance to DSA as needed, including advising on ethical aspects of internal governance for data scientists.

- b. Develop a data ethics advisory service providing ethical guidance and support for Home Office projects.

In response to the commission the Data Ethics Advisory Group (DEAG) was established to consider ethical issues in Home Office data projects and provide a source of advice and guidance for project teams.

Over this commission period the DEAG has developed a submission form for the receipt of appropriate data projects and a process for review. The submission and review process will be continually reviewed to ensure that it meets the needs of Home Office project teams.

The DEAG has considered its first case, and feedback on the process has been positive. The DEAG will continue to review data use cases from across the Home Office as needed.

As the work of the DEAG continues and evolves the BFEG will look to address part c. of the 2019/2020 commission:

- c. Once fully established, we would look to this group to provide input into the development of further discipline-specific ethics guidance and procedures.

## Biometrics and forensics access and retention

- a. Advise on approaches to collection, use, retention, and deletion of different biometrics and of extracted digital forensic material.
- b. Advise on ethical issues regarding the use of extracted information obtained through digital forensics investigations in large datasets for the purposes of data-driven policing and/or the training of algorithms to improve digital forensics tools.

In response to the 2019/2020 commission the Biometrics and Digital Forensics (BDF) Working Group was established.

The BDF Working Group has considered ethical issues surrounding police requests to extract material from digital devices belonging to a complainant, victim or witness, and has made a series of recommendations. The working group would also welcome the opportunity to provide advice during the development of the code of practice about the extraction of information noted in the draft Police, Crime, Sentencing and Courts Bill (section 40).

The working group will continue to provide ethical advice and recommendations on specific topics provided by the policy team and co-opt individuals with appropriate technical expertise to assist as necessary.

## Forensic Information Database Services

The BFEG continues to support the Forensic Information Databases Strategy Board (FIND SB).

The BFEG was asked by the FIND SB to consider the ethical implications associated with the potential use of [genetic genealogy](#) techniques by law enforcement and, following the submission of advice to [Forensic Information Database Services \(FINDS\)](#) the BFEG published a report in

September 2020 on the feasibility of using genetic genealogy methods to assist in solving crime in the UK.

The BFEG is also working with FINDS and the Forensic Capability Network to feed into the review of DNA sample kits.

FINDS is reviewing the process for National DNA Database [near match report](#) data integrity checks. Over the next commissioning period the BFEG may be asked to work with FINDS on any ethical considerations identified from the review.

The BFEG would also seek to be consulted on the ethical issues in proposed agreements for international biometric data exchange following the changes resulting from leaving the EU.

### Other stakeholders

The BFEG continues to support the Forensic Science Regulation Unit (FSRU) and over the last year has advised on elements of new DNA guidance documents that were published in spring 2021. The BFEG will continue to provide support to the FSRU and the new [Forensic Science Regulator](#) with ethical advice.

### Previous commission/self-commission

#### Facial recognition

Following an evidence gathering event in June 2020 the Facial Recognition Working Group (FRWG) published a [report](#) into the collaborative use of [live facial recognition](#) in January 2021.

The FRWG continues to keep a watching brief over the use of facial recognition and the development of other recognition technologies, such as object, body and voice recognition.

The BFEG is interested in the development of the revised police guidance on use of live facial recognition and the public sector equality duty proposal with Cardiff University in response to the *Bridges v. South Wales Police* judgment.

#### Ethical principles

The update to the [BFEG ethical principles](#) was published in December 2020 following a proposal from BFEG member, Dr Adil Akram. The updated principles explicitly state that procedures should not deliberately or inadvertently target or selectively disadvantage people or groups on the basis of ‘protected characteristics’ as defined in the Equality Act 2010. The update to the principles also highlights that procedures should respect, without discrimination, human rights as defined in the Human Rights Act 1998.



## Summary of advice and recommendations to FINDS

No.	Proposal	Advice/Recommendation
1	Release, subject to initial assessment, familial DNA matches with profiles on the National DNA Database to a forensic service provider (FSP) for comparison of the complete set of DNA markers.	<p>The policy was agreed, however the Biometrics and Forensics Ethics Group (BFEG) wished to note:</p> <ul style="list-style-type: none"> <li>the lack of oversight of the algorithms used by the FSPs;</li> <li>that the new method should ensure increased efficiency and a reduction in false positives; and</li> <li>that a review of the number of false positives resulting from the use of the additional markers should be considered – this would need to be by geographical area as searches were restricted to crime relevant geographical areas.</li> </ul>
2	To allow searching of the Vulnerable Persons' DNA Database (VPDD) against DNA profiles sourced from unidentified body/part(s), and certain crime scene profiles.	<p>The policy was agreed subject to changes to the VPDD consent form. The BFEG noted that only samples taken with the new consent form should be subject to the new policy.</p>
3	Agree amendments to the VPDD consent forms to allow for routine searching.	<p>The BFEG noted improvements were needed to the consent form in terms of clarity and readability:</p> <ul style="list-style-type: none"> <li>consent forms should be reviewed by an expert in readability;</li> <li>the form should be provided in other languages;</li> <li>the tone of volunteer consent forms should be reviewed;</li> <li>technical terms should be clarified;</li> <li>specific examples should be included;</li> <li>contact details should be included so that an individual could withdraw consent if they chose to; and</li> <li>a copy of the form must be provided to the donor.</li> </ul> <p>The clarity and readability issues identified by the BFEG would apply to all DNA sample consent forms, therefore the BFEG will look to work with:</p> <ul style="list-style-type: none"> <li>the Forensic Capability Network on a review of the Police and Criminal Evidence Act 1984 and elimination DNA forms; and</li> <li>the Forensic Information Databases Service on the Missing Persons' DNA database consent form.</li> </ul>

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## Appendix 1: Glossary

Artificial intelligence (AI)	In computer science AI refers to any human-like intelligence exhibited by a computer, robot, or other machine. AI is the ability of a machine to perform a task usually done by humans, such as recognising objects, understanding and responding to language, making decisions, and solving problems.
Biogeographical ancestry	A method of inferring a person's geographical origins based on their genetic ancestry [ <i>see <a href="#">genetic genealogy</a></i> ]. Also known as admixture analysis.
Biometrics and Surveillance Camera Commissioner	The Biometrics Commissioner and Surveillance Camera Commissioner roles were established by the Protection of Freedoms Act 2012, which introduced the regime to govern the retention and use by the police of DNA samples, profiles and fingerprints, and to promote appropriate overt use of surveillance camera systems by relevant authorities in England and Wales. Since March 2021, these roles have been undertaken by one full-time commissioner.
Data Protection Impact Assessment (DPIA)	Data Protection Impact Assessment is a process to help identify and minimise the data protection risks of a project.
Deoxyribonucleic acid (DNA)	The chemical in the cells of an organism that comprises 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 and packaged into chromosomes.
Digital forensic material	The information extracted from any digital system or data storage media, rendered into a useable form, processed, and interpreted for the purpose of obtaining intelligence for use in investigations, or evidence for use in criminal proceedings.
DNA-17	DNA-17 is a particular type of <a href="#">DNA</a> profiling test that looks at 16 areas of an individual's DNA plus a sex marker [ <i>see also <a href="#">STR DNA profile</a></i> ]. There are multiple, specific profiling chemistries within DNA-17, which have differences in design that can result in slight differences in the resulting profiles. Other profiling chemistries exist that look at different numbers of areas of DNA and/or different areas, but only the information contained within the DNA-17 set are currently retained on the <a href="#">National DNA Database</a> .
Elimination DNA sample	A <a href="#">DNA</a> sample taken from an individual and used to create a <a href="#">DNA profile</a> in order to identify possible DNA contamination.
Facial recognition	Identifying or verifying a person from a digital image or a live video source by comparing it to selected facial features from a known source image.
Familial searching	Searching a <a href="#">DNA profile</a> from an unknown individual against the <a href="#">National DNA Database</a> for profiles that may have come from a close relative. As half a person's DNA is inherited from the mother and half from the father, relatives such as parents, children and siblings will share a predictable amount of DNA.

Forensic Information Databases Service (FINDS)	The Home Office unit responsible for administering the <a href="#">National DNA Database</a> , National Fingerprint Database and Footwear Database.
Forensic Information Databases Strategy Board (FIND SB)	The board providing governance and oversight over the <a href="#">National DNA Database</a> and the National Fingerprint Database. It has a number of statutory functions, including issuing guidance on the destruction of profile records and producing an annual report.
Forensic Science Regulator (FSR)	The official responsible for ensuring that the provision of forensic services across the criminal justice system is subject to an appropriate regime of scientific quality standards. The Forensic Science Regulator Act 2021 makes provisions for a statutory code of practice for forensic science activity in England and Wales. Compliance with this code would be overseen by the FSR.
Genetic genealogy	A method using powerful DNA analysis, distinct from <a href="#">short tandem repeat</a> (STR) DNA profiling, to identify individuals who may be related (sometimes distantly) by searching proprietary genetic genealogy databases to find a match with other individuals who share common sections of DNA. The likely relationship between individuals is predicted from the amount of DNA in common. A short list of individuals with common DNA is then used by genetic genealogists to construct family trees and attempt to identify a common ancestor.
Home Office Biometrics (HOB) programme	A programme running since 2014, that delivers services supporting fingerprints, facial images and DNA (the main biometric modalities currently extensively used in the UK public sector). It also develops capabilities across the Home Office, law enforcement and, where appropriate, more widely across the Government.
Live facial recognition (LFR)	The automated one-to-many ‘matching’ of near real-time video images of individuals with a curated ‘watchlist’ of facial images.
Machine learning	A branch of artificial intelligence (AI) [ <i>see above</i> ] focused on building applications that learn from data. Machine learning algorithms improve their accuracy with experience without being explicitly programmed to do so.
Missing Persons’ DNA Database (MPDD)	A database containing <a href="#">DNA profile</a> records of missing persons, relatives of missing persons (where a reference DNA profile is not available for the missing person), unidentified bodies and some crime stain DNA profile records that may be linked to missing persons or unidentified bodies (for example, a no-body murder case).
National DNA Database (NDNAD)	Established in 1995, the NDNAD is an electronic, centralised database holding <a href="#">short tandem repeat</a> (STR) <a href="#">DNA profiles</a> taken from both individuals and crime scenes. The database can be searched to provide the police with a match to an individual or a match linking an individual to a crime scene and <i>vice versa</i> .

Near match report	A report is created when two <a href="#">DNA profiles</a> are identical except for a specific number of values. The NDNAD defines a near match as two DNA profiles where all alleles are identical except one. One source of this difference is where the profiles were generated using two different profiling chemistries [ <i>see also</i> <a href="#">DNA-17</a> ].
Phenotype	A term used in genetics to describe observable, physical characteristics that are influenced by genes. For example, eye or hair colour.
Relationship testing	DNA relationship testing, sometimes referred to as kinship testing, is the application of DNA analysis to establish how individuals are related to each other. This may be useful for establishing the identity of a deceased person using DNA from relatives or for establishing the parentage of a child.
Short tandem repeat (STR)	DNA is composed of four types of bases known as A, T, C and G. STRs are short sections of DNA that contain repeating sequences of bases (such as AATGAATGAATG). The number of times the sequence of DNA is repeated (in this example three times) varies between individuals so it can be used to tell people apart [ <i>see also</i> STR <a href="#">DNA profile</a> ].
STR DNA profile	A DNA profile is created by counting the number of times a section of DNA is repeated at specific areas in a person's DNA [ <i>see short tandem repeat</i> ]. Pairs of numbers will be generated as a person has two copies of DNA (if the number of repeats was five on both copies the profile would be 5,5, if it was five on one strand and six on the other it would be 5,6). The number of areas of DNA looked at depends on the profiling chemistry used [ <i>see</i> <a href="#">DNA-17</a> ]. The presence of the sex chromosomes, X and Y, is also tested. The numerical representation allows DNA profiles to be uploaded to a database and compared with other DNA profiles. (For further information the Royal Society has published a <a href="#">primer on DNA analysis</a> .)
Vulnerable Persons' DNA Database (VPDD)	A database containing <a href="#">DNA profiles</a> from vulnerable persons who are at potential risk of harm, such as people at risk from honour based assault or forced marriage, sex workers and those potentially at risk of sexual exploitation, or where the police consider the individual at risk. When a vulnerable person volunteers to provide a DNA sample, consent is sought for the resulting profile to be retained on the VPDD and searched against the NDNAD under specific circumstances.
Y-STR profiling	A form of DNA analysis involving only DNA found on the Y-chromosome. Analysing Y-chromosome DNA can be useful in cases where this is a mixture of DNA from a male and a female as the Y-chromosome is only found in males. Y-STR analysis can also be used to carry out <a href="#">relationship testing</a> as DNA on the Y-chromosome is passed down the male line (father to son).



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## Appendix 2: Member profiles

### **Mark Watson-Gandy (Chair)**

Professor Mark Watson-Gandy was called to the Bar of England and Wales in 1990. He was a Junior Counsel to the Crown from 2000 to 2012. In 2013, he was also called to the Eastern Caribbean Bar (British Virgin Islands) and in 2018 to the DIFC (Dubai) Bar. He is a tenant at Three Stone Chambers, a specialist chancery/commercial barristers' chambers in Lincoln's Inn.

He is a Visiting Professor at the University of Westminster (teaching their Corporate Finance Law LLM), a Visiting Professor at the Université de Lorraine (in Nancy) (teaching English Law) and a Special Lecturer at Cass Business School (teaching on their Executive MBA). He was appointed to the Court of the University of Essex in 2015.

As well as for his work internationally as a barrister, he is known for his pro bono work in the Parliamentary Inquiry into the Gurkha Veterans' Welfare, on the lobby for a 'Samaritan defence' for St John Ambulance and for the legal work underpinning the 2010 Papal Visit to Britain.

Mark is non-executive chairman of a number of companies including Mental Health First Aid England (from breakeven to being among, according to the *Financial Times*, the top 1,000 [537th] fastest growing small- and medium-sized enterprises [SMEs] in Europe), Kids MBA Ltd (whose course teaching 12- to 15-year-olds core business skills is delivered in schools and summer camps under licence internationally) and Pure Cremation Group Ltd (from start up to the largest [national] provider of direct cremation funerals).

### **Dr Adil Akram**

Adil is a Consultant Psychiatrist, based mainly at South West London and St George's Mental Health NHS Trust from 2009 onwards. He is also an Honorary Senior Lecturer at St George's, University of London. He has published on antipsychotics, perinatal psychiatry, parenting with mental illness and the social care needs of women with mental illness. He has qualifications in healthcare education and mental health research. He has a longstanding interest in genetics, medical ethics and medical law from his time studying medicine at King's College, University of Cambridge. He has significant experience of dealing with complex ethical dilemmas and risk assessments.

Adil also works for the Ministry of Justice as a Judicial Officer and Medical Member of the first-tier tribunal service, hearing detained patient appeals under the Mental Health Act. He has detailed knowledge and experience of legislation relevant to mental health. His other roles and contributions to public service have included working with the General Medical Council to help to write and develop tests of competency, being an elected Governor of his local NHS Trust and volunteering as a Psychiatrist at the London 2012 Olympic Games.

### **Professor Louise Amoore**

Louise is a Professor of Human Geography at Durham University. Her research expertise is focused on the geographies of biometric and security technologies, with a particular interest in how contemporary forms of data, analytics and risk management are changing the techniques of biometric data collection and analysis. Louise is currently a Leverhulme Major Research Fellow investigating how the foundation of law, ethics and accountability is challenged by new methods of machine learning and automated recognition.

### **Professor Liz Campbell**

Liz is the inaugural Francine McNiff Chair in Criminal Jurisprudence at Monash Law, Australia, having previously been Professor of Criminal Law at Durham University. She is also adjunct Professor at Queensland University of Technology School of Justice.

Liz is a global expert in corporate crime, organised crime, corruption, and biometric evidence. Her research is socio-legal in considering the law in context, and often involves a comparative dimension. Liz's research has a significant impact outside academia. Her research has been cited by the Irish Supreme Court and relied upon in arguments before the UK Supreme Court. Her work has also been cited in reports of law reform commissions.

Liz sits on a number of editorial boards and is a member of the UK's Arts and Humanities Research Council Peer Review College. Liz previously chaired Durham Constabulary's Ethics Committee and served on the NHS Research Ethics Committee (Scotland).

### **Professor Simon Caney**

Simon is a Professor in Political Theory at the University of Warwick. He has worked on a wide range of topics including global poverty, equality, climate change, our obligations to future generations, the social discount rate, liberal neutrality, political perfectionism, multiculturalism, national self-determination, secession, sovereignty, human rights, resistance, humanitarian intervention, war, non-ideal political theory, realism in international relations, and democratic theory. He has engaged with policy makers at the World Bank, the Trades Union Congress, Oxfam America, and the UN, and is a member of the Nuffield Council for Bioethics.

### **Professor Richard Guest**

Professor Richard Guest, Professor of Biometric Systems Engineering and Head of the School of Engineering and Digital Arts, University of Kent. His research work is in the area of biometric technologies, examining aspects of systems deployment and algorithm development, usability, standardisation, sample quality and conformance. His work has also examined the use of human identification/verification mechanisms within automated processes. He is also the Chair of the Training and Education Committee of the European Association of Biometrics (EAB) and a Fellow of the British Computer Society.

He has had significant involvement with biometrics standards development as UK Principal Expert to ISO/IEC JTC1 SC37. He is currently the Project Coordinator for the AMBER EU Marie Skłodowska-Curie ITN in Mobile Biometrics and is Kent PI on the Engineering and Physical Science Research Council (EPSRC) Hummingbird Project. He is also a member of the Kent academic team for the PriMa EU Marie Skłodowska-Curie ITN.

### **Professor Nina Hallowell (co-opted June 2020 to March 2021)**

Nina is a senior researcher at the Ethox Centre, Nuffield Department of Population Health, University of Oxford, where she is involved in a programme of research on ethical issues arising from the use of big data. She has over 20 years of experience of undertaking research on the social and ethical implications of the introduction of genetic and genomic technologies in medicine and has published widely in this field. She has qualifications in social sciences and medical law and ethics. She taught ethics at the University of Edinburgh and has been a member of a number of research ethics committees in Edinburgh, Cambridge and Newcastle.

## **Dr Julian Huppert**

Dr Julian Huppert is an academic and politician. His research looked at the structure and function of DNA beyond the double helix, and he then served as Member of Parliament for Cambridge between 2010 and 2015. During this time, he served on the Home Affairs Select Committee for five years and was the ISPA Internet Hero of the Year 2013. He is now Director of the Intellectual Forum, a new interdisciplinary centre at Jesus College, Cambridge.

He is also a Director of the Joseph Rowntree Reform Trust Ltd, Deputy Chair of the NHS Cambridgeshire and Peterborough CCG, and a Visiting Professor at King's College, London. He was also the first Chair of the Independent Review Panel for DeepMind Health.

## **Professor Mark Jobling**

Mark is a Professor of Genetics at the University of Leicester, specialising in human evolutionary genetics, forensics, genetic genealogy, ancestry testing and genetics in historical studies. He has held a series of three consecutive Wellcome Trust Senior Fellowships, is a senior editor of the *Annals of Human Genetics*, co-director of the Alec Jeffreys Forensic Genomics Unit and was the University of Leicester's Research Excellence Framework academic lead for Biological Sciences in 2014 and 2021. Mark is lead author of the textbook *Human Evolutionary Genetics* (Garland Science) and has published over 150 scientific papers including recent work on new technologies in forensic DNA analysis.

## **Dr Nóra Ní Loideáin**

Dr Ní Loideáin is Director and Lecturer in Law of the Information Law and Policy Centre at the Institute of Advanced Legal Studies, University of London. She is also a Visiting Lecturer in Law at King's College London, a Senior Research Fellow at the University of Johannesburg's Faculty of Humanities, and an Associate Fellow of the University of Cambridge Leverhulme Centre for the Future of Intelligence (LCFI).

Nóra's research interests focus on governance, human rights law, and technology and her forthcoming publications include her PhD from the University of Cambridge on state surveillance and European human rights law. This is the focus of her forthcoming monograph – *EU Data Privacy Law and Serious Crime* (Oxford University Press). She is also co-author of the forthcoming textbook: Lynskey and Ní Loideáin, *Data Protection Law and Policy* (Oxford University Press).

Nóra is an editor of the leading peer-review journal *International Data Privacy Law* (Oxford University Press) and was appointed to the Board of Trustees of the British and Irish Legal Information Institute (BAILII) in 2018. Prior to her academic career, she was a Legal and Policy Officer for the Office of the Director of Public Prosecutions of Ireland and clerked for the Irish Supreme Court.

## **Isabel Nisbet MPhil BPhil MA**

Isabel is a member of the National Statistician's Data Ethics Group and of the Board of Qualifications Wales (the regulator of examinations and qualifications in Wales). She serves on the Board of Governors of two higher education institutions (the University of Hertfordshire and the University College of Osteopathy). She is also a member of the British and Irish Ombudsman Association and from 2004 to 2011 she was an independent member of the Council of St George's Medical School.

Isabel has previously held a variety of senior posts in the civil service, and then moved on to work in the regulation of medicine and education. She has held chief executive and director positions at several statutory regulatory bodies (including Ofqual [Office of Qualifications and

Examinations Regulation] and the General Medical Council), giving her extensive experience of dealing with complex and sensitive human rights, fairness and public confidence issues.

Isabel is also an Affiliated Lecturer in the Faculty of Education at the University of Cambridge and is co-author of *Is Assessment Fair?* (SAGE publications).

### **Professor Charles Raab**

Charles Raab is Professorial Fellow of the University of Edinburgh, and formerly Professor of Government; visiting positions at institutions in the UK, Germany, the Netherlands, New Zealand and Canada. Co-Director, Centre for Research into Information, Surveillance and Privacy (CRISP). Fellow of the Alan Turing Institute (ATI) and Co-Chair, ATI Data Ethics Group. Member, Police Scotland, Independent Ethics Advisory Panel; member, Digital Identity Scotland Expert Group; Co-Chair, Independent Digital Ethics Panel for Policing (IDEPP, until its 2020 dissolution); member, Europol Data Protection Experts' Network. Research on privacy, data protection, surveillance, governance and regulation, 'smart' environments, identity and identification, security, democracy, data ethics. Many projects funded by the ESRC, the EU, and the National Science Foundation (USA). Current UKRI/ESRC project: 'Privacy, Agency and Trust in Human-AI Ecosystems' (PATH-AI), based at ATI.

Books include *The Governance of Privacy* (2003; 2006); *Protecting Information Privacy* (2011); *A Report on the Surveillance Society* (2006); *Video Surveillance* (2012); *Policing the European Union* (1995); many journal articles and book chapters. General Co-Editor, Routledge Studies in Surveillance book series.

Charles has written reports and provided advice to the European Commission, many UK and Scottish government departments, the New Zealand Law Commission, the EU Agency for Fundamental Rights (FRA), and research organisations in the UK and the Netherlands. He has provided evidence to several UK parliamentary committees (e.g., the Intelligence and Security Committee, 2014). Specialist adviser, House of Lords Constitution Committee for inquiry, *Surveillance: Citizens and the State*, HL Paper 18, Session 2008–2009. He is a Fellow of the Academy of Social Sciences and a Fellow of the Royal Society of Arts.

### **Professor Tom Sorell**

Tom Sorell is a Professor of Politics and Philosophy in PAIS and the Department of Philosophy, and head of the Interdisciplinary Ethics Research Group in PAIS. He was an RCUK Global Uncertainties Leadership Fellow (2013–2016), working on ethics in counter-terrorism and the fight against organised crime. Before that he led the Warwick work on SURVEILLE a counter-terrorism, human rights and surveillance project. He was (CO-I) of the (ESRC)-funded Assuming Online Identities project (2014–2017), and more recently of the EPSRC-funded DAPM project (on mass market fraud) and headed the Warwick contribution to the FP7 SIIP project on speech identification technology. He leads the Warwick work on PERICLES a Horizon 2020 project on anti-radicalisation and was CO-I on the H2020 Media4sec project on policing and social media.

He is Vice-Chairman of the Home Office Biometrics and Forensics Ethics Group. A member of the Data Ethics Committee of the West Midlands Police Commissioner, he is also Chair of the General Ethics Committee of West Midlands Police.

He has published recent peer-reviewed articles on preparatory offences, problems in the conceptualisation of organised crime, digilantism, victimisation in romance scamming fraud, section 15 of the Sexual Offences Act 2003 definitions of serious crime, stalking as an extreme privacy violation, big data ethics and policing, and the use of electronic monitoring for offenders.

He is co-editor (with John Guelke and Kat Hadjimatheou) of *Security Ethics* (Routledge, 2018).

## **Professor Denise Syndercombe Court**

Denise is a Professor of Forensic Science at King's College London. Her experience includes scientific research, forensic evidence examination and DNA interpretation, and the civil and criminal justice process, including court presentation as an expert witness. She is a specialist in complex DNA profiling interpretation, forensic genetics and blood pattern analysis. Denise is the Secretary-General of the British Academy of Forensic Sciences and has an active interest in promoting science to a wider audience via television, radio and external lectures.

## **Professor Jennifer Temkin, CBE**

Jennifer is Professor of Law at City, University of London and Emeritus Professor of Law at Sussex University. She is a Bencher of the Middle Temple and a Fellow of the Academy of Social Sciences. Her specialist area is criminal justice, particularly in relation to sexual offences. She has published widely in this field and her books include *Rape and the Legal Process* (2002) and *Sexual Assault and the Justice Gap* (2008) with Barbara Krahe. She has been a frequent contributor to discussion in the media. She has also engaged in training programmes for Crown prosecutors, judges, barristers and doctors. In connection with her work, she has served on the following committees:

- Old Bailey Scrutiny Committee on Draft Criminal Code, 1985–1986;
- Home Office Advisory Group on Video-Recorded Evidence in Criminal Trials (The Pigot Committee), 1988–1989;
- National Children's Home Committee of Enquiry into Children and Young People Who Abuse Other Children, 1990–1992;
- SCOSAC (Standing Committee on Sexually Abused Children), 1993–1996, Patron (with Dame Margaret Drabble);
- Justice Committee on Sexual Offences Law Reform, 1998;
- External Reference Group, Home Office Sex Offences Review, 1999–2000;
- Scientific Expert, Council of Europe's Committee of Experts on the Treatment of Sex Offenders, 2003–2005;
- Expert Group on Rape and Sexual Assault, Victims of Violence and Abuse Prevention Programme, Department of Health and National Institute for Mental Health in England, 2005–2007;
- Disability Forum, Disability Protection Project, Handicap International, 2010, Expert Advisor;
- Board of Diploma in the Forensic and Clinical Aspects of Sexual Assault (DFCASA), Society of Apothecaries of London, 2010–2012.

At City, she now teaches a course entitled 'Forensic Science and the Legal Process'. She chaired the BFEG's Working Group on Ethical Principles.

## **Dr Peter Waggett**

Peter is the Director of Research at IBM, making him responsible for all aspects of research conducted in the UK, and represents the UK in IBM's wider research agenda. He holds multiple patents relating to biometrics and imaging systems and is editor of a number of biometric standards. Peter has a PhD in image processing and was the biometrics lead responsible for specifying, evaluating and testing the UK's visa waiver system.



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