



Home Office



National DNA Database Strategy Board Biennial Report 2018 - 2020

National DNA Database Strategy Board Biennial Report 2018-2020

Presented to Parliament pursuant to Section 63AB(8) of the Police and Criminal Evidence Act 1984

September 2020



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Contents

Ministerial Foreword	1
Chair of the Strategy Board’s Foreword	2
1. The National DNA Database (NDNAD)	6
1.1 About NDNAD	6
1.1.1 Introduction	6
1.1.2 DNA profile records.....	6
1.1.3 Matches	7
1.1.4 Familial searches	8
1.1.5 Identical siblings	8
1.1.6 Who runs NDNAD?.....	8
1.2.1 Number of profile records held on and deleted from NDNAD	10
Figure 1: Number of subject profile records held on NDNAD (in millions) (2010/11 to 2019/20)	11
1.2.2 Geographical origin of subject profile records on NDNAD	15
Table 3: Number of subject and crime scene profile records retained on NDNAD by nation (as at 31st March 2019)	15
Table 4: Number of subject and crime scene profile records retained on NDNAD by nation (as at 31st March 2020)	15
1.2.3 Sex, age and ethnicity of individuals on NDNAD	16
Figure 3a: Proportion of subject profile records on NDNAD by sex (as at 31st March 2019)	16
Figure 4a: Proportion of subject profile records on NDNAD by sex (as at 31st March 2020)	16
Figure 3b: Number of subject profile records on NDNAD by ethnicity, as determined by the sampling officer (as at 31st March 2019)	17
1.3 How many crimes does NDNAD help solve?	20
1.3.1 Introduction	20
1.3.2 Types of searches	20
1.3.3 Match rate	20
Figure 5: Match rate on loading a crime scene profile (2010/11 to 2019/20)	21
Table 5a: Number of routine subject to crime scene matches made by crime type (2018/19)	22
Table 6a: Number of routine subject to crime scene matches made by crime type (2019/20)	23
Table 5b: Number of non-routine search matches made by crime type (2018/19) 23	
Table 5c: Number of urgent non-routine search matches by crime type (2018/19)	25

Table 6c: Number of urgent non-routine search matches by crime type (2019/20)	25
1.4 Missing and Vulnerable Persons Databases	28
1.4.1 Missing Persons DNA Database (MPDD)	28
1.4.3 Vulnerable Persons DNA Database (VPDD)	30
1.5.1 Home Office Biometrics Programme	31
1.5.2 Contamination Elimination Database	31
1.5.3 DNA mixture profile differentiation on the NDNAD	32
1.6 Security and Quality Control	32
1.6.1 Access to NDNAD	32
1.6.3 Error rates	33
Table 7: Error rates 2018/2019	35
Table 8: Error rates 2019/2020	36
1.6.4 FSP accreditation	37
1.6.5 Forensic Science Regulator	37
1.7 Finance 2018 - 2020	37
2. National Fingerprint Database	38
2.1 Introduction	38
2.1.1 Fingerprint records	38
2.1.2 Fingerprint Matches	39
2.1.3 Outcomes using Fingerprints	41
The number of offenders convicted with the help of Fingerprint evidence is not recorded. However here are some examples of cases using fingerprint evidence:-	41
2.1.4 Who runs the National Fingerprint Database?	42
2.1.5 Access to National Fingerprint database	43
2.2 Who is on IDENT1?	44
2.2.1 Number of profile records held on IDENT1 System	44
Table 9. Records held on IDENT 1	44
Figure 6: Number of individuals on IDENT 1 (in millions) (March 2011 to March 2020)	45
Figure 7: Number of Fingerprint Forms Held for all Subjects on IDENT1 (in millions) (March 2011 to March 2020)	45
	45
Figure 8: Number of unique unidentified mark submissions held on IDENT 1 (in millions) (March 2010 to March 2019)	46
2.5 Technology and business process developments on the National Fingerprint Database in 2018/19 & 2019/20	48

3. International Data exchange	52
4. Legislation governing DNA and Fingerprint retention	55
4.1 Overview	55
4.2 Protection of Freedoms Act 2012	55
4.2.1 Introduction	55
4.2.2 DNA profile records and fingerprints	55
4.2.3 DNA samples	55
4.2.4 Biometrics Commissioner	55
4.2.5 Extensions	56
4.2.6 Speculative searches	56
Table 6a: Retention periods for convicted individuals	56
Table 6b: Retention periods for unconvicted individuals	57
4.3 Early Deletion	58
Glossary	59

Ministerial Foreword

The Government is committed to ensuring that the National DNA Database (NDNAD) and the National Fingerprint Database are instrumental in supporting policing and that they continue to be an effective tool for the police in helping to solve crimes and also to prove people's innocence.

In 2018/19 the NDNAD provided 30,551 routine matches, including to 626 homicides and 639 rapes, and 214 urgent matches, including 46 to homicides and 59 to rapes. In 2019/20 the NDNAD provided 22,916 routine matches including 601 to homicides and 555 to rapes and 219 urgent matches, including 58 to homicides and 56 to rapes. The percentage of crime scene profiles which matched a subject profile on load to the NDNAD (referred to as the match rate) was 67% in 2018/19 and 66% in 2019/20. Although there was a decrease in the overall number of matches reported in 2019/20 compared to the previous year, there was only a small decrease in the match rate, so it continues to demonstrate the effectiveness of the NDNAD.

This report includes information on the National Fingerprint Database policing collections and the National DNA Database. Work on the Home Office Biometrics (HOB) DNA Strategic Project has continued over these 2 years covered by this report and it is now nearing completion of the first stage, which will deliver a replacement platform on which the NDNAD sits with enhanced functionality. A further stage is planned for increased international capability, creating better links with similar databases in other countries, and it is of note for the commencement in 2019/20 of Prüm international DNA exchanges between the UK and EU Member States. In addition there has also been continued and significant progress made by HOB on improving fingerprint checking and searching.

Kit Malthouse MP

Minister of State (Minister for Crime and Policing)

Chair of the Strategy Board's Foreword

I am very pleased to present this report as Chair of the Forensic Information Databases (FIND) Strategy Board; this being my first since taking over as Chair of the Board in August 2018.

During this reporting period we have continued to align the governance and oversight of the Fingerprint and DNA databases in support of the Government's strategy for forensic science and in providing clearer and more transparent governance.

A significant amount of work has been completed during this two year period to enable Prüm international DNA exchanges between the UK and EU Member States to commence from July 2019. The UK's connection to Prüm DNA has produced positive results for both the UK and the EU partners connected so far. From searches of historic data held on the UK's National DNA Database, the UK has received around 13,000 initial 'hits' from its Prüm DNA connections. In turn, EU Member States have received approximately 47,000 initial hits from their connections with the UK.

The Home Office Biometrics (HOB) Programme project to deliver a replacement IT system (with enhanced capability) for the National DNA Database has continued over this reporting period, with this significant development now nearing completion. There has also been extensive work carried out by HOB to enhance fingerprint matching and checking services; with this report outlining the key details for the changes and benefits.

Another significant technological development this reporting period has seen the Contamination Elimination Database (CED) project move to a business as usual service. This continues to develop with an expansion of the database including the DNA profile records of staff where there is the potential for the contamination of crime scene DNA samples through the environment within which DNA sampling occurs, or consumables used within the DNA sampling and processing.

The effectiveness of the NDNAD as an important tool for policing has continued to be demonstrated by the overall match rate, remaining at 66% in 19/20, following the loading of a crime scene profile.



Ben Snuggs

Assistant Chief Constable

NPCC Chair of the Forensic Information Databases Strategy Board

The Forensic Information Database Strategy Board

Governance and oversight of the National DNA Database¹ is provided by the Forensic Information Databases (FIND) Strategy Board, referred to in statute as the NDNAD Strategy Board. Following the publication of the government's Forensic Science Strategy, the governance role of the Strategy Board was expanded from the NDNAD alone to cover the National Fingerprint Database, during 2016/2017 and the name was changed accordingly. Since 31st October 2013, the Board has operated on a statutory basis.²

The strategic aim of the Strategy Board is to provide governance and oversight for the operation of the National DNA and Fingerprint Databases:

- it must issue guidance about the destruction of DNA profiles and fingerprints retained under the Protection of Freedoms Act 2012 (PoFA)³;
- it may issue guidance about the circumstances under which applications for retention under PoFA⁴ may be made to the Commissioner for the Use and Retention of Biometric Material ('The Biometrics Commissioner')^{5 6};
- it must publish governance rules which must be laid before Parliament⁷; and
- it must make an annual report to the Home Secretary about the exercise of its functions⁸.

The statute still refers to the requirement for the 'NDNAD Strategy Board' to publish an annual report, so this report is titled accordingly. However, in line with the wider responsibilities described above, the report covers both the national DNA and fingerprint databases.

The governance rules^{9,10} set out in more detail the way in which the Board operates, and include its objectives¹¹ which are to implement strategy and policy to ensure:

- the most effective and efficient use of DNA and fingerprint databases to support the purposes laid down in the legislation (and no other), these are;
 - the interests of national security;
 - terrorist investigations;
 - the prevention and detection of crime;
 - the investigation of an offence or the conduct of a prosecution; and

¹ As set out under section 3 of the governance rules.

² As set out under section 63AB of the Police and Criminal Evidence act 1984 (PACE) as inserted by section 24 of PoFA.

³ Section 63AB(2), Police and Criminal Evidence Act 1984.

⁴ Ibid 2, section 63G.

⁵ Ibid 2., section 63AB(4).

⁶ The Biometrics Commissioner's latest annual report is available at:

<https://www.gov.uk/government/publications/biometrics-commissioner-annual-report-2018>

⁷ Ibid 2, section 63AB(6).

⁸ Ibid 2, section 63AB(7).

⁹ The governance rules are published at: <https://www.gov.uk/government/publications/national-dna-database-strategy-board-governance-rules>.

¹⁰ Currently being rewritten to reflect the change in remit of the Board (i.e. to include for the National Fingerprint Database),

¹¹ As set out under section 4 of the governance rules.

- the identification of a deceased person.
- the public is aware of the governance, capability and limitations of the NDNAD and fingerprint databases so that confidence is maintained in its use across all communities;
 - That the future use of the NDNAD and fingerprint databases takes account of developments in science and technology and delivers improvements in efficiency and effectiveness across the Criminal Justice System.
 - The most proportionate, ethical and transparent use of the NDNAD and fingerprint databases across the Criminal Justice Service.
 - The most ethical and effective use of international searching of UK DNA profiles and fingerprints.

The core members of the Board are:

- a representative of the National Police Chiefs' Council
- a representative of the Home Office;
- a representative of the Association of Police and Crime Commissioners;

Additional members¹² include:

- the Chair of the Biometrics and Forensics Ethics Group ¹³
- the Information Commissioner (or representative);
- the Forensic Science Regulator¹⁴ (or representative);
- the Biometrics Commissioner (or representative);
- representatives from the police and devolved administrations of Scotland and Northern Ireland; and
- such other members as may be invited.

The rules go on to specify:

- the responsibilities of the Board;
- the appointment of the Chair;
- rules around audits;
- the delegation of functions; and
- the proceedings of the Board.

They may be added to, repealed or amended with the agreement in writing of the Home Secretary.

¹² As set out under section 5 of the governance rules.

¹³ The Biometrics and Forensics Ethics group annual report is available at [The report is available at: https://www.gov.uk/government/publications/biometrics-and-forensics-ethics-group-annual-report-2018](https://www.gov.uk/government/publications/biometrics-and-forensics-ethics-group-annual-report-2018)

¹⁴ The Regulator's latest annual report is available at: <https://www.gov.uk/government/publications/forensic-science-regulator-annual-report-2019>

The Biometrics and Forensics Ethics Group

The Biometrics and Forensics Ethics Group (BFEG)¹⁵, which replaced the National DNA Database Ethics group in 2017, provides independent expert advice to Home Office ministers on ethical issues related to the use of biometrics, forensics, and large data sets.

The remit of the group includes consideration of the ethical impact on society, groups and individuals, of the capture, retention and use of human samples and biometric identifiers. This includes DNA and fingerprints, as well as facial recognition and other biometric identifiers.

Current work streams for the BFEG include:

- Provision of advice on Home Office projects using explainable data-driven technology such as automated categorisation of data
- Investigation of the ethical issues in the use of live facial recognition technology in collaborations between police forces and private entities
- Provision of ethical advice to the Home Office Biometrics programme and review of their Data Protection Impact Assessments

The group also provides support and advice on ethical matters to other stakeholders such as the Biometrics Commissioner and the Forensic Science Regulator.

In addition, the Chair of BFEG sits on the Forensic Information Databases Strategy Board and provides advice in areas such as:

- Policy regarding the retention of biometrics from convicted individuals;
- Governance and ethical operation of police databases containing biometric information;
- Policy on access to and use of the Forensic Information Databases and other matters relating to the management, operation and use of biometric or forensic data;
- The ethical application and operation of technologies which produce biometric and forensic data and identifiers;
- Ethical issues relating to scientific services provided to the police service and other public bodies within the criminal justice system;
- Review of applications for research involving access to biometric or forensic data;
- Review of the annual report from the FIND Strategy Board and other policy and consultation documents prepared by the Home Office.

¹⁵ <https://www.gov.uk/government/organisations/biometrics-and-forensics-ethics-group>

1. The National DNA Database (NDNAD)

1.1 About NDNAD

1.1.1 Introduction

NDNAD was established in 1995. It holds electronic records of deoxyribonucleic acid (DNA), known as profile records, taken from individuals and crime scenes, and provides the police with matches linking an individual to a crime scene or a crime scene to another crime scene. Between April 2001 and March 2020 it produced **731,160**¹⁶ matches to unsolved crimes.

1.1.2 DNA profile records

NDNAD holds two types of DNA profile:

i. Individuals

The police can take a 'DNA sample' from every individual that they arrest. This consists of their entire genome (the genetic material that every individual has in each of the cells of their body) and is usually taken by swabbing the inside of the cheek to collect some cells. The sample is then sent to an accredited laboratory, known as a 'forensic service provider' (FSP), which looks at discrete areas of the genome (which represent only a tiny fraction of that individual's DNA) plus the sex chromosomes (XX for women and XY for men¹⁷) and use these to produce a 'subject' profile consisting of 16 pairs of numbers (which correspond to the 16 areas analysed) and a sex marker derived from the sex chromosomes. The profile is almost unique in unrelated individuals; the chance of two unrelated people having identical profile records is less than one in a billion¹⁸. Aside from sex, a DNA profile does not reveal any other characteristics of the individual it is taken from such as their race or physical appearance.

An example profile would be:

X,Y; 14,19; 9.3,9.3; 12,15; 22,23; 28,30; 11,14; 19,20; 9,12; 13,15; 18,18; 15,15; 10,13; 14,16; 18,21; 15,16; 24,29

The DNA profile is loaded to NDNAD where it can be searched against DNA profile records recovered from crime scenes.

ii. Crime scenes

¹⁶ This figure includes matches between individuals and crime scenes and between different crime scenes.

¹⁷ An individual's DNA is contained within discrete structures within a cell known as chromosomes. Men have a copy of an X and Y chromosome whereas women have two copies of the X chromosome.

¹⁸ As agreed with the Forensic Science Regulator and the Crown Prosecution Service, in order to give a conservative figure, routine statistical reporting of DNA evidence in court continues to be reported as 'one in a billion'. Certain cases might be reported with a more precise probability; this is assessed on a case-by-case basis.

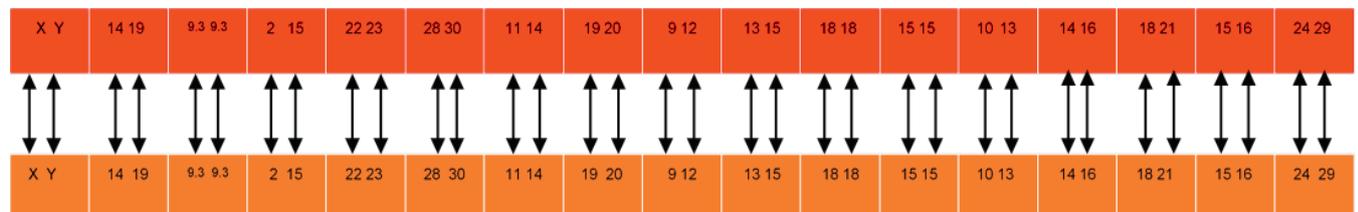
DNA is recovered from crime scenes by police Crime Scene Investigators (CSIs). Nearly every cell in an individual's body contains a complete copy of their DNA so there are many ways in which an offender may leave their DNA behind at a crime scene (for example, in blood or skin cells left on clothing or surfaces) even just by touching something. CSIs examine places where the perpetrator of the crime is most likely to have left traces of their DNA behind. Items likely to contain traces of DNA are sent to an accredited laboratory for analysis. If the laboratory recovers any DNA, it will produce a crime DNA profile which can be loaded to NDNAD.

1.1.3 Matches

NDNAD searches the DNA profile records from crime scenes against the DNA profile records from individuals or other crime scenes. A full match occurs when the 16 pairs of numbers (and sex marker) representing an individual's DNA are an exact match to those in the DNA left at the crime scene or when a crime scene profile matches another crime scene profile.

i. Full Match

The diagram below illustrates a match between a subject profile (Top row) and a crime scene profile (Bottom row).

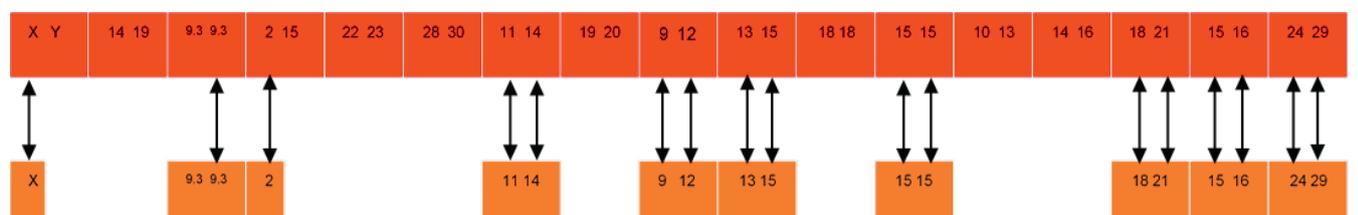


Where a match is made, this indicates that the individual may be a suspect in the police's investigation of the crime. It may also help to identify a witness or eliminate other people from the police investigation.

ii. Partial Match

Sometimes it is not possible to recover a complete DNA profile from the crime scene; for instance where the perpetrator has tried to remove the evidence or because it has become degraded. In these circumstances, a partial crime profile is obtained, and searched against individuals on NDNAD, producing a partial match.

The diagram below illustrates a partial match between a subject profile (Top row) and a crime scene profile (Bottom row).



Partial matches provide valuable leads for the police but, depending on how much of the information is missing, the result is likely to have lower evidential weight than a full match.

1.1.4 Familial searches

One half of an individual's DNA profile is inherited from their father and the other half from their mother. As a result, the DNA profile records of a parent and child, or two siblings, will share a significant proportion of the 16 pairs of numbers. This means that, in cases where the police have found the perpetrator's DNA at the crime scene, but they do not have a profile on NDNAD, a search of the database, known as a 'familial search', can be carried out to look for possible close relatives (parents, children, or siblings) of the perpetrator. Such a search may produce a list of possible relatives of the offender. The police use other intelligence, such as age and geography, to narrow down the list before investigating further. The search is computerised and involves only the DNA profile records on NDNAD.

Due to the cost and staffing needed to carry out familial searches, they are used only for the most serious of crimes. All such searches require the approval of the FIND Strategy Board chair or their nominee. A total of **17** familial searches were carried out in 2018/19 and a total of **16** familial searches were carried out in 2019/20.

1.1.5 Identical siblings

The inherited nature of DNA means that identical siblings will share the same DNA profile, and the DNA profiling system currently used for NDNAD purposes cannot differentiate between identical siblings. However, even identical siblings have different fingerprints so these can be used to differentiate them. Fingerprints may be taken by the police electronically from any individual that they arrest. They are then scanned into IDENT1, the national fingerprint database. Unlike DNA (where samples have to be sent to a laboratory for processing) fingerprints can be loaded instantly allowing police to verify a person's identity at the police station, thereby ensuring that their DNA profile and arrest details are stored against the correct record.

As at 31st March 2019, **9,907** possible sets of identical twins and **14** possible sets of identical triplets have been identified on the NDNAD.

As at 31st March 2020, **10,326** possible sets of identical twins and **15** possible sets of identical triplets have been identified on the NDNAD.

1.1.6 Who runs NDNAD?

Since 1st October 2012, NDNAD has been run by the Home Office on behalf of UK police forces. 36¹⁹ vetted Home Office staff have access to it. Police forces own the

¹⁹ This is as at 05/03/20 and includes 7 administration accounts.

DNA profile records on the database, and receive notification of any matches, but they do not have access to it.

1.2 Who is on NDNAD?

1.2.1 Number of profile records held on and deleted from NDNAD

As at 31st March 2019, NDNAD held **6,387,001** subject profile records and **624,907** crime scene profile records. The number of subject records held on the NDNAD is shown in figure 1. In 2018/19, **258,134** new subject profile records were loaded to NDNAD, together with **38,789** new crime scene profile records. Figures 2a & 2b show the number of profile records loaded to the NDNAD per year. Table 1 shows the breakdown of crime scene records loaded in 2018/19 by offence type.

As at 31st March 2020, NDNAD held **6,568,035** subject profile records and **647,378** crime scene profile records. The number of subject records held on the NDNAD is shown in figure 1. In 2019/20, **268,892** new subject profile records were loaded to NDNAD, together with **31,569** new crime scene profile records. Figures 2a & 2b show the number of profile records loaded to the NDNAD per year. Table 2 shows the breakdown of crime scene records loaded in 2019/20 by offence type.

Some individuals have more than one profile on NDNAD. This can occur where the force chooses to load another record or where they are sampled twice under different names. Approximately **14.7%**²⁰ of the profile records on NDNAD are duplicates of an individual already sampled. Allowing for these duplicates, the estimated number of individuals on NDNAD as at 31st March 2020 was **5,604,185** (as at 31/03/19 14.0% of records were estimated to be duplicates and the estimated number of individuals was **5,491,832**)

In 2018/19 **117,430** subject profile records were deleted from NDNAD (including **188** under the 'Deletion of Records from National Police Systems guidance ('the Record Deletion Guidance'); see '3.3 Early Deletion'). Additionally, **4,846** crime scene profile records were deleted.

In 2019/20 **124,492** subject profile records were deleted from NDNAD (including **280** under the 'Deletion of Records from National Police Systems guidance ('the Record Deletion Guidance'); see '3.3 Early Deletion'). Additionally, **7,597** crime scene profile records were deleted.

²⁰ This figure is based on the assumption that a subject profile record that matches a further subject profile record(s) is sourced from just one individual

Figure 1: Number of subject profile records held on NDNAD (in millions) (2010/11 to 2019/20)^{21 22}

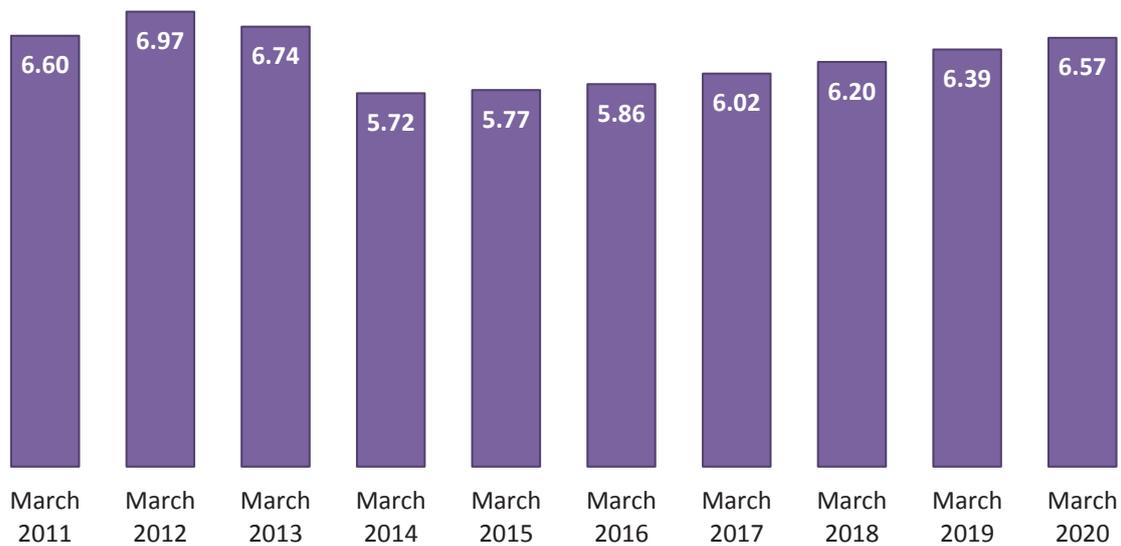
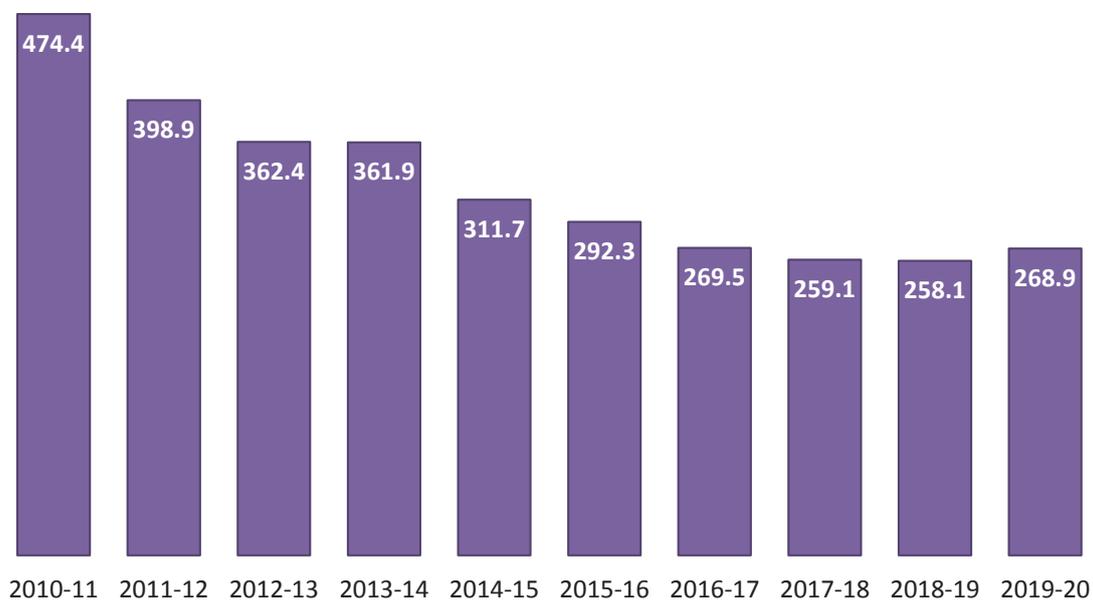


Figure 2a: Number of subject profile records loaded onto NDNAD per year (in thousands) (2010/11 – 2019/20)^{23 24 25}



²¹ Source: NDNAD management information.

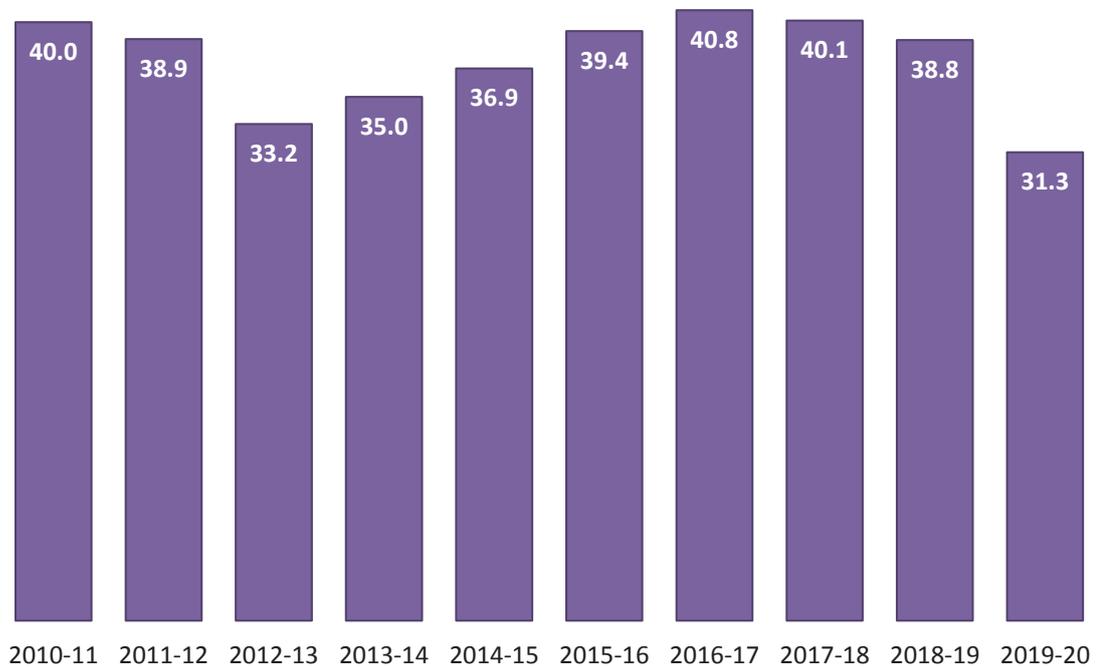
²² The deletion of profiles which did not meet the retention criteria for profile records brought in by PoFA was completed by 30th September 2013 hence the drop in the number of profile records.

²³ Due to technical difficulties accessing the management information system used to record data on NDNAD, the figures for 2014/15, onwards have been calculated using a different methodology from previous years.

²⁴ There are some NDNAD profile records held for which the load date is unknown; these are not included in these figures.

²⁵ Source: NDNAD management information.

Figure 2b: Number of crime scene profile records loaded onto NDNAD per year (in thousands) (2010/11 – 2019/20) ^{26 27}



²⁶ Source: NDNAD management information.

²⁷ Due to technical difficulties accessing the management information system used to record data on NDNAD, the figures for 2014/15, onwards have been calculated using a different methodology from previous years and are not directly comparable with the figures used in Table 1

Table 1: Number of crime scene profile records loaded by crime type (2018/19)^{28 29 30}

Crime type	Number of crime scene profile records loaded	Proportion of total number of crime scene profile records loaded (%)
Burglary (including aggravated)	17,826	47%
Vehicle Crime	5,842	15%
Criminal Damage	2,062	5%
Violent Crime	1,919	5%
Drugs	2,185	6%
Robbery	1,747	5%
Theft	624	2%
Rape	851	2%
Homicide (including attempted) and manslaughter	794	2%
Traffic (including fatal)	544	1%
Firearms	686	2%
Other sexual offences ²⁷	235	1%
Arson and fire investigations	231	1%
Fraud	127	0%
Public Order	140	0%
Abduction and kidnapping	170	0%
Blackmail	11	0%
Explosives	6	0%
Other	1,947	5%
TOTAL	37,947	100%

²⁸ Source: NDNAD management information.

²⁹ Offence types are recorded by forensic staff processing the DNA sample and do not correspond to police recorded crime codes.

³⁰ Due to technical difficulties accessing the management information system used to record data on NDNAD, these figures have been calculated using a different method to the methodology used prior to 2014/15 and are not directly comparable to the figures used in Figures 2b.

Table 2: Number of crime scene profile records loaded by crime type (2019/20)^{31 32 33}

Crime type	Number of crime scene profile records loaded	Proportion of total number of crime scene profile records loaded (%)
Burglary (including aggravated)	13,071	48%
Vehicle Crime	3,701	13%
Criminal Damage	1,397	5%
Violent Crime	1,388	5%
Drugs	2,019	7%
Robbery	1,283	5%
Theft	452	2%
Rape	627	2%
Homicide (including attempted) and manslaughter	753	3%
Traffic (including fatal)	518	2%
Firearms	504	2%
Other sexual offences ²⁷	176	1%
Arson and fire investigations	182	1%
Fraud	73	0%
Public Order	106	0%
Abduction and kidnapping	141	1%
Blackmail	7	0%
Explosives	3	0%
Other	1,078	4%
TOTAL	27,479	100%

³¹ Source: NDNAD management information.

³² Offence types are recorded by forensic staff processing the DNA sample and do not correspond to police recorded crime codes.

³³ Due to technical difficulties accessing the management information system used to record data on NDNAD, these figures have been calculated using a different method to the methodology used prior to 2014/15 and are not directly comparable to the figures used in Figures 2b.

1.2.2 Geographical origin of subject profile records on NDNAD

NDNAD holds profile records from all UK police forces (as well as the Channel Islands and the Isle of Man) but only profile records belonging to England and Wales forces are subject to PoFA³⁴. Scotland and Northern Ireland also maintain separate DNA databases; however, due to the likelihood of offenders moving between UK nations, profile records loaded to these databases are also loaded to NDNAD.

Table 3: Number of subject and crime scene profile records retained on NDNAD by nation (as at 31st March 2019)^{35 36}

Nation	Subject profile records	Crime scene profile records	TOTAL
England ³⁷	5,469,596	571,737	6,041,333
Scotland	362,850	18,412	381,262
Wales	352,638	25,292	377,930
Northern Ireland	160,137	6,956	167,093
Other ³⁸	41,780	2,510	44,290
TOTAL	6,387,001	624,907	7,011,908

Table 4: Number of subject and crime scene profile records retained on NDNAD by nation (as at 31st March 2020)^{35 36}

Nation	Subject profile records	Crime scene profile records	TOTAL
England ³⁷	5,615,953	592,434	6,208,387
Scotland	371,848	18,879	397,900
Wales	365,967	26,052	384,846
Northern Ireland	171,037	7,370	178,407
Other ³⁸	43,230	2,643	45,873
TOTAL	6,568,035	647,378	7,215,413

³⁴ Scotland and Northern Ireland have their own retention regime.

³⁵ Source: NDNAD management information.

³⁶ NDNAD does not hold individuals' addresses. The geographical information provided is based on the location of the police force that submitted the profile record.

³⁷ Includes the British Transport Police

³⁸ Includes Isle of Man, Guernsey, Jersey, Channel Islands, Ministry of Defence police forces, Criminal Records Office, National Crime Agency, Her Majesty's Revenue and Customs, Criminal Cases Review Commission and the Prisoner Sampling Programme.

1.2.3 Sex, age and ethnicity of individuals on NDNAD

The subject profile records held on NDNAD all come from people who have been arrested for an offence, so the composition is different from that of the general population. For example, only half the UK population is male but the majority of DNA profile records belong to men, because the majority of those arrested are male.

Figure 3a: Proportion of subject profile records on NDNAD by sex (as at 31st March 2019)³⁹

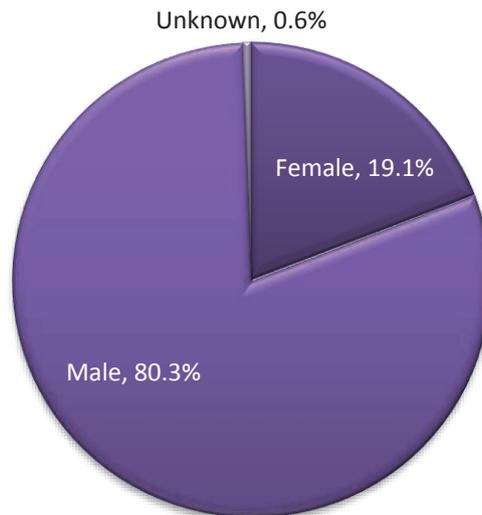
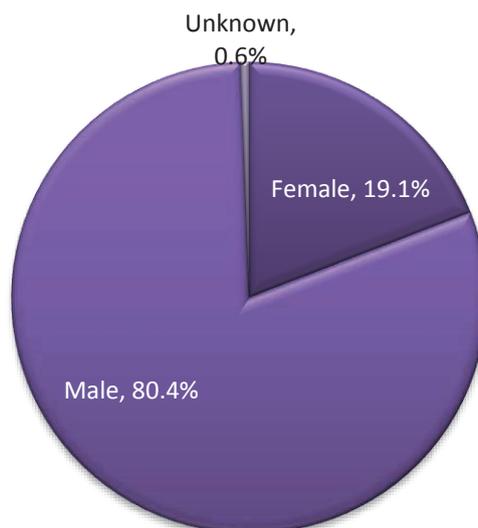


Figure 4a: Proportion of subject profile records on NDNAD by sex (as at 31st March 2020)^{40 41}



³⁹ Source: NDNAD management information.

⁴⁰ Source: NDNAD management information.

⁴¹ Due to rounding, the figures do not equal 100%

Figure 3b: Number of subject profile records on NDNAD by ethnicity, as determined by the sampling officer (as at 31st March 2019)^{42 43}

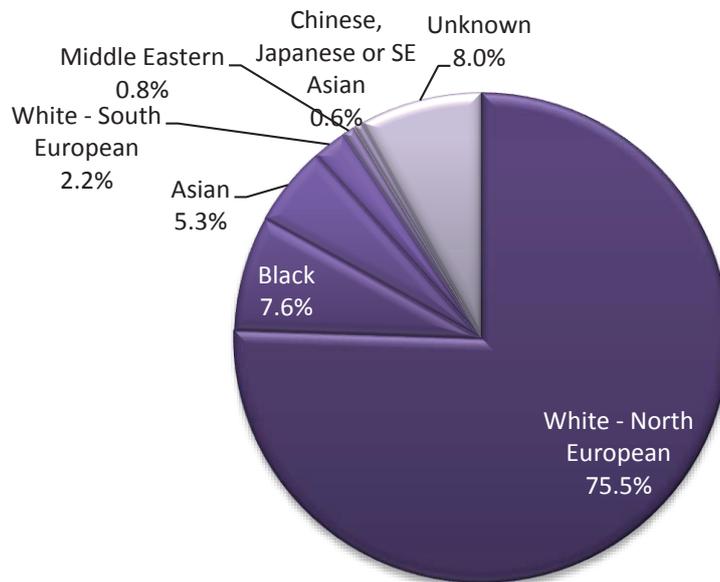
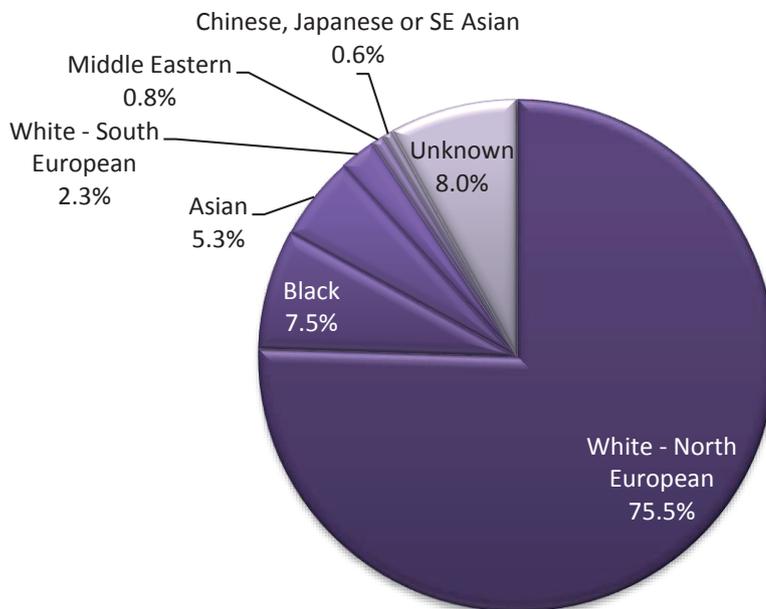


Figure 4b: Number of subject profile records on NDNAD by ethnicity, as determined by the sampling officer (as at 31st March 2020)⁴⁴



⁴² Source: NDNAD management information.

⁴³ The ethnicity of the individual is determined by the police officer who took the DNA sample. Unknown profile records refer to those where the officer either selected 'ethnicity unknown' on the recording form or where there was no ethnicity data accompanying the profile record.

⁴⁴ Source: NDNAD management information.

Figure 3c: Number of subject profile records by age at time of loading onto NDNAD (as at 31st March 2019)^{45 46 47}

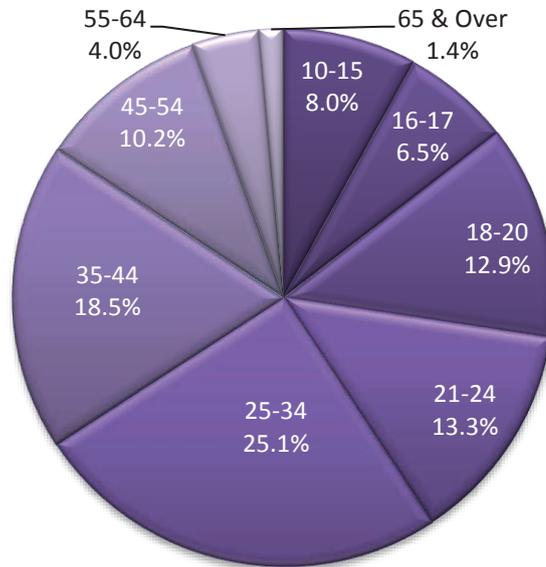
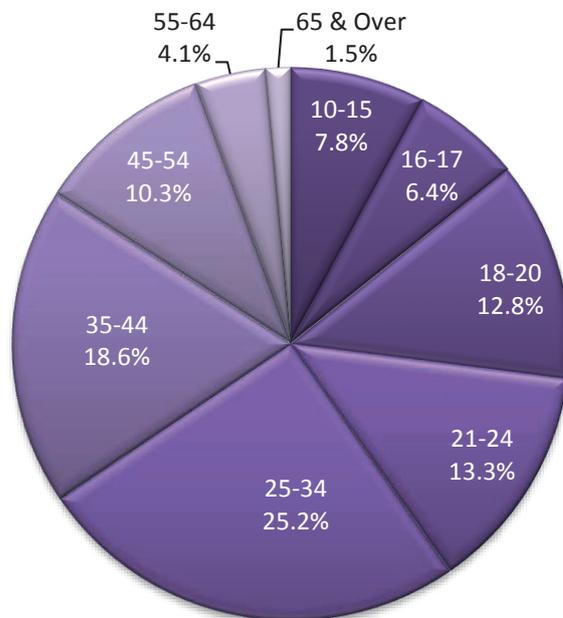


Figure 4c: Number of subject profile records by age at time of loading onto NDNAD (as at 31st March 2020)^{48 49}



⁴⁵ Source: NDNAD management information.

⁴⁶ This is calculated from the date of birth provided by the individual to the police officer at the time of arrest.

⁴⁷ Due to rounding, the figures do not equal 100%

⁴⁸ Source: NDNAD management information

⁴⁹ This is calculated from the date of birth provided by the individual to the police officer at the time of arrest.

These data are published quarterly on NDNAD web page on www.gov.uk⁵⁰. The age of criminal responsibility in England and Wales is 10; there were 9 profiles from children aged under 10 on NDNAD. These were all Scottish Samples which were taken from 'Vulnerable persons' (an individual who was believed to have the potential to come to harm and / or go missing) and were loaded with appropriate consent and authorisation for retention and searching on the NDNAD.

⁵⁰ The data are available at: www.gov.uk/government/organisations/home-office/series/dna-database-documents

1.3 How many crimes does NDNAD help solve?

1.3.1 Introduction

NDNAD matches crime scene profile records against subject profile records and other crime scene profile records, providing the police with invaluable information that helps them to identify possible suspects and solve crimes (albeit that a DNA match in itself is not usually sufficient to secure a conviction so not every match will lead to a crime being solved).

1.3.2 Types of searches

i. Routine loading and searching

As described at paragraph 1.1.2, samples are usually profiled and the profile records are then loaded to NDNAD for routine searching. Routine matches made from profile records loaded to NDNAD are shown in table 5a & 6a below.

ii. Non-Routine and urgent searches

In order for a profile to be uploaded to NDNAD, it must consist of a minimum of four pairs of numbers and a sex marker (for crime scene profile records) and a full profile⁵¹ (for subject profile records). Where this criterion is not met, for crime scene records, it is nonetheless possible to carry out a non-routine search of NDNAD. For the most serious crimes, NDNAD provides an urgent non-routine search service which is available 24 hours a day.

Matches made following non-routine searches are shown in tables 5&6 b and those made following urgent searches in tables 5&6c.

1.3.3 Match rate

i. Overall match rates

In 2018/19, the chance that a crime scene profile, once loaded onto NDNAD, matched against a subject profile stored on NDNAD was **66.94%**⁵². Figure 5 shows the yearly match rate on loading a crime scene profile to the NDNAD.

In 2019/20, the chance that a crime scene profile, once loaded onto NDNAD, matched against a subject profile stored on NDNAD was **65.52%**⁵³. Figure 5 shows the yearly match rate on loading a crime scene profile to the NDNAD.

These do not include crime scenes that match another crime scene on loading, or where a profile was deleted in the same month as it was loaded.

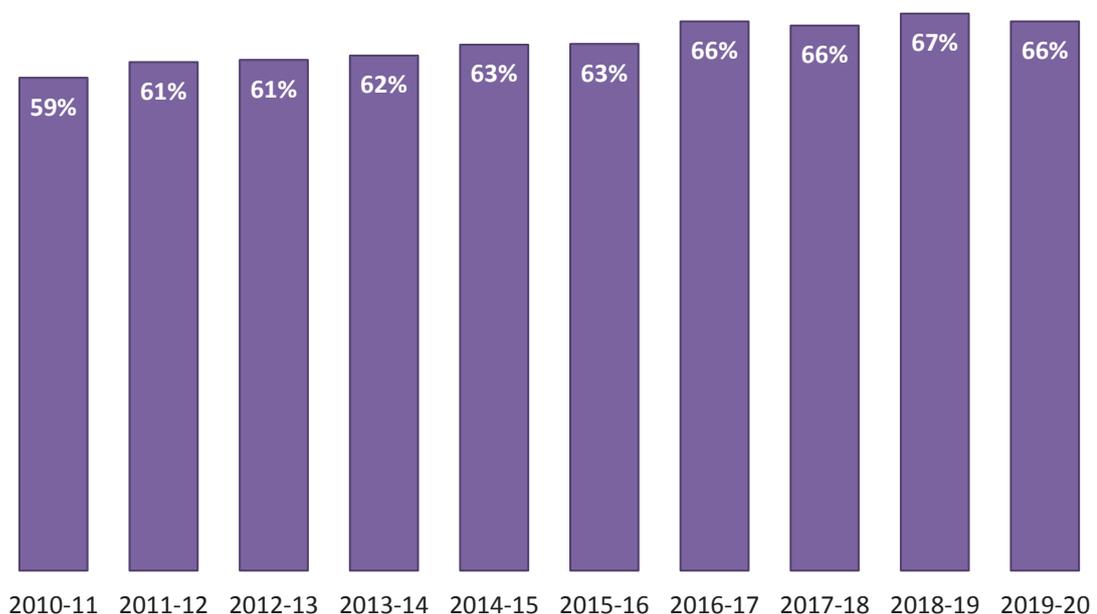
⁵¹ The profile record may either be from DNA-17 (i.e. 16 numbers plus a sex marker) or from the previous system SGMPlus (i.e. 10 numbers plus a sex marker).

⁵² Excludes crime scene to crime scene matches.

⁵³ Ibid 52

Further matches will occur when a new subject profile is added to NDNAD and matches to a crime scene profile already on it. As at 31st March 2019, there were **207,891**⁵⁴ crime scene profile records on NDNAD that had not yet been matched. As at 31st March 2020, there were **213,003**⁵⁵ crime scene profile records on NDNAD that had not yet been matched. The crimes relating to these crime scenes might be solved if the perpetrator’s DNA was taken and added to NDNAD. Every individual who is arrested will have their DNA searched against existing crimes on NDNAD, even if their profile is subsequently deleted.

Figure 5: Match rate on loading a crime scene profile (2010/11 to 2019/20)⁵⁶



ii. Number of matches⁵⁷

In 2018/19, NDNAD produced **214** subject to crime scene matches following on from an urgent search of NDNAD, including to **46** homicides and attempted murders⁵⁸ and **59** rapes, the offence breakdown of these matches is shown in table 5c. It also produced **30,551** routine subject to crime scene matches, including to **626** homicides and **639** rapes, the offence breakdown of these routine matches is shown in table 5a. It provided **1,377** crime scene to crime scene matches (this information is useful in

⁵⁴ More than one crime scene profile record may be held for a single crime. Crime scene profile records that matched before 2002 are included in this figure.

⁵⁵ Ibid 52

⁵⁶ Source: NDNAD management information.

⁵⁷ Due to issues with the NDNAD Management Information system in 2014/15, since then matches have been counted at sample rather than case level.

⁵⁸ This includes murder and manslaughter.

helping to identify serial offenders). It also provided **3,246** matches following a non-routine search. A large number of the non-routine searches will produce a partial match, although a partial match has less evidential value than a full match, it can nonetheless provide the police with useful intelligence about a crime. The offence breakdown of these non-routine searches can be seen in table 5b.

In 2019/20, NDNAD produced **219** subject to crime scene matches following on from an urgent search of NDNAD, including to **58** homicides and attempted murders⁵⁹ and **56** rapes, the offence breakdown of these matches is shown in table 6c. It also produced **22,916** routine subject to crime scene matches, including to **601** homicides and **555** rapes, the offence breakdown of these routine matches is shown in table 6a. It provided **921** crime scene to crime scene matches (this information is useful in helping to identify serial offenders). It also provided **2,964** matches following a non-routine search. A large number of the non-routine searches will produce a partial match, although a partial match has less evidential value than a full match, it can nonetheless provide the police with useful intelligence about a crime. The offence breakdown of these non-routine searches can be seen in table 6b.

Table 5a: Number of routine subject to crime scene matches made by crime type (2018/19)^{60 61 62}

Crime	Matches
Burglary (including aggravated)	13,377
Vehicle crime	5,158
Criminal damage	1,897
Violent crime	1,756
Drugs	1,646
Robbery	1,447
Theft	557
Rape	639
Homicide (including attempted) and manslaughter	626
Traffic (including fatal)	522
Firearms	573
Other sexual offences	179
Arson and fire investigations	173
Fraud	85
Public order	129
Abduction and kidnapping	141
Blackmail	4
Explosives	5
Other ⁶³	1,637
TOTAL	30,551

⁵⁹ This includes murder and manslaughter.

⁶⁰ Source: NDNAD management information.

⁶¹ Offence types are recorded by forensic staff processing the DNA sample and do not correspond to police recorded crime codes.

⁶² Because of the way in which the data is recorded and because all profiles loaded to the NDNAD are routinely searched against all profiles held on the NDNAD it is not possible to provide figures for the number of searches or the match rate for this table as has been provided for tables 3b & c.

⁶³ Includes other volume, serious and terrorism offences.

Table 6a: Number of routine subject to crime scene matches made by crime type (2019/20)

Crime	Matches
Burglary (including aggravated)	10,151
Vehicle crime	3,468
Criminal damage	1,377
Violent crime	1,299
Drugs	1,483
Robbery	1,103
Theft	441
Rape	555
Homicide (including attempted) and manslaughter	601
Traffic (including fatal)	496
Firearms	416
Other sexual offences	145
Arson and fire investigations	164
Fraud	71
Public order	84
Abduction and kidnapping	107
Blackmail	5
Explosives	3
Other ⁶⁴	947
TOTAL	22,916

Table 5b: Number of non-routine search matches made by crime type (2018/19)⁶⁵

Crime	Searches	Matches	Matches (%)
Burglary (including aggravated)	1,854	1,000	54%
Vehicle crime	567	385	68%
Criminal damage	78	60	77%
Violent crime	230	154	67%
Drugs	375	261	70%
Robbery	384	222	58%
Theft	66	46	70%
Rape	392	215	55%
Homicide (including attempted) and manslaughter	210	102	49%
Traffic (including fatal)	37	29	78%
Firearms	207	139	67%
Other sexual offences	109	49	45%
Arson and fire investigations	37	22	59%

⁶⁴ Includes other volume, serious and terrorism offences.

⁶⁵ Source: NDNAD management information.

Fraud	28	17	61%
Public Order	11	8	73%
Abduction and kidnapping	40	22	55%
Blackmail	5	1	20%
Explosives	1	0	0%
Other ⁶⁶	1,895	514	27%
TOTAL	6,526	3,246	50%

Table 6b: Number of non-routine search matches made by crime type (2019/20)

Crime	Searches	Matches	Matches (%)
Burglary (including aggravated)	1,660	900	54%
Vehicle crime	366	250	68%
Criminal damage	50	26	52%
Violent crime	210	125	60%
Drugs	406	290	71%
Robbery	361	224	62%
Theft	56	35	63%
Rape	233	114	49%
Homicide (including attempted) and manslaughter	200	100	50%
Traffic (including fatal)	44	27	61%
Firearms	263	163	62%
Other sexual offences	104	53	51%
Arson and fire investigations	37	21	57%
Fraud	12	4	33%
Public Order	8	6	75%
Abduction and kidnapping	42	22	52%
Blackmail	1	0	0%
Explosives	0	0	N/A
Other ⁶⁷	2,321	604	26%
TOTAL	6,374	2,964	47%

⁶⁶ Includes other volume, serious and terrorism offences.

⁶⁷ Includes other volume, serious and terrorism offences.

Table 5c: Number of urgent non-routine search matches by crime type (2018/19)⁶⁸

Crime	Searches	Matches	Matches (%)
Burglary (including aggravated)	22	16	73%
Vehicle Crime	0	0	N/A
Criminal Damage	0	0	N/A
Violent Crime	18	11	61%
Drugs	13	9	69%
Robbery	14	9	64%
Theft	0	0	N/A
Rape	119	59	50%
Homicide (including attempted) and manslaughter	74	46	62%
Traffic (including fatal)	0	0	N/A
Firearms	22	15	68%
Other sexual offences	33	19	58%
Arson and fire investigations	4	3	75%
Fraud	0	0	N/A
Public Order	0	0	N/A
Abduction and kidnapping	8	4	50%
Blackmail	0	0	N/A
Explosives	1	0	0%
Other ⁶⁹	54	23	43%
TOTAL	382	214	56%

Table 6c: Number of urgent non-routine search matches by crime type (2019/20)⁷⁰

Crime	Searches	Matches	Matches (%)
Burglary (including aggravated)	20	15	75%
Vehicle Crime	0	0	N/A
Criminal Damage	0	0	N/A
Violent Crime	20	14	70%
Drugs	9	6	67%
Robbery	23	16	70%
Theft	2	0	0%
Rape	98	56	57%
Homicide (including attempted) and manslaughter	97	58	60%
Traffic (including fatal)	1	1	100%
Firearms	22	15	68%
Other sexual offences	21	12	57%
Arson and fire investigations	3	2	67%

⁶⁸ Source: NDNAD management information.

⁶⁹ Includes other volume, serious and terrorism offences.

⁷⁰ Source: NDNAD management information.

Fraud	0	0	N/A
Public Order	1	1	100%
Abduction and kidnapping	4	3	75%
Blackmail	5	3	60%
Explosives	0	0	N/A
Other ⁷¹	37	17	46%
TOTAL	363	219	60%

1.3.4 Outcomes

The number of offenders convicted with the help of DNA evidence is not recorded. However, DNA evidence is instrumental⁷² in the conviction of the perpetrators of many serious crimes. For example:-

1. West Yorkshire Police 'Cold Case' Murder of Amy Shepherd

86 year old Amy Shepherd was found dead in her ground floor flat in Wibsey, Bradford in August 1994. Raymond Kay, aged 70 was identified as part of a 'Cold Case Review' carried out by West Yorkshire Police, which involved the application of new, specialist forensic techniques on exhibits seized as part of the original enquiry 25 years earlier. Raymond Kay's name was first put forward as a result of a DNA match on the National DNA Database when a small hair recovered from Amy's neck was subjected to very sensitive DNA profiling. Raymond Kay was given a mandatory life sentence and will serve a minimum of 17 years before he can be considered for release.

2. Murder of Jill Hibberd - South Yorkshire Police

The body of 73 year old Jill Hibberd was found in the living room of her home in Barnsley, South Yorkshire, on the 31st May 2018, having been brutally attacked. She was found by neighbours, concealed behind the sofa; a post mortem revealed that she had died as a result of sustaining in excess of 68 stab wounds. Following targeted cellular recovery from Jill's body and fast-track DNA analysis, a match to Lee Fuelop was released by the National DNA Database within 48 hours of Jill's body being discovered. Lee Fuelop then became the focus of the enquiry and several other persons of interest were exonerated. 40 year old Lee Fuelop was found guilty at Sheffield Crown Court and given a mandatory life sentence.

3. West Yorkshire Police Rape

In the early hours of the 1st September 2018, a 67 year old woman was subjected to a terrifying sexual assault by an unknown intruder who forced entry into the assisted-living retirement complex where she lived. The victim managed to fight off her attacker, and thought she had scratched his face during the struggle. A male matching the description given by the victim was arrested a few streets away and remanded into custody. The victim's nail scrapings were fast-tracked and a male DNA profile was

⁷¹ Includes other volume, serious and terrorism offences.

⁷² Prosecutions are very rarely based on DNA evidence alone.

derived which did not match the suspect. This unknown profile was immediately searched against the National DNA Database, and a name was returned. The male was located, arrested and his clothing recovered; he was found to have cuts/marks to his face consistent with being scratched. This demonstrates the power of the National DNA Database in both exonerating innocent individuals at an early stage in serious crime investigations, and identifying potential suspects quickly, to allow further forensic evidence to be secured. The male was found guilty and sentenced to a minimum of 12 years in prison.

1.4 Missing and Vulnerable Persons Databases

NDNAD holds DNA profile records generated from DNA samples taken from arrested individuals and crime scenes. Previously, it also held profile records relating to missing persons, and from individuals at risk of harm, for the purposes of identifying a body should one be found. In order to separate DNA profile records for individuals who have been arrested, from records for missing people and vulnerable people (which are given with consent), there are now separate databases for missing and vulnerable persons.

1.4.1 Missing Persons DNA Database (MPDD)

The MPDD holds DNA profile records obtained from the belongings of people who have gone missing or from their close relatives (who will have similar DNA). If an unidentified body is found that matches the description of a missing person, DNA can be taken from the body and compared to the relevant record on the MPDD to see if there is a match. This assists with police investigations and helps to bring closure for the family of the missing person. Profile records on the MPDD are not held on NDNAD.

As at 31st March 2019, there were **1,759** records on the MPDD. In 2018/19, the MPDD produced **36** matches⁷³

As at 31st March 2020, there were **1,879** records on the MPDD. In 2019/20, the MPDD produced **22** matches⁷⁴.

1.4.2 MPDD Cases

Below are some examples of cases involving the MPDD.

Case 1

On the 13th April 2018, a dog walker discovered the body of a deceased male. The man was of muscular build and wearing a fleece and dark trousers but had no other distinguishing features from which to identify him. A DNA profile was taken by the police force and checked against the MPDD. A match was obtained instantly to a low risk missing man who had been reported missing three weeks previously. It is believed he had committed suicide. Obtaining such a quick and DNA match allowed family and friends to be notified promptly and support provided by the police force.

⁷³ During 18/19 the MPDD changed their procedures so they no longer require matches to be confirmed by the Forensic Service Providers – the number of matches reported in previous annual reports has been the number of confirmed matches.

⁷⁴ During 18/19 the MPDD changed their procedures so they no longer require matches to be confirmed by the Forensic Service Providers – the number of matches reported in previous annual reports has been the number of confirmed matches.

Case 2

In February 2018, a local resident was walking along the shoreline in Dorset and discovered a human skull. Carbon dating work performed on the skull informed Police that the individual died after 1957 and he was male in gender. The DNA was uploaded to the MPDD in May 2018 and a match was obtained with a man who was reported missing in December 2012 by his crew mate. He had been travelling towards Poole in a small boat when it was hit by a freak wave and sadly he had not been seen since. As the skull was the only remains located, there were no other means of identifying this man other than through DNA.

Case 3

In November 2018, partial skeletal remains were found in woodland in Gloucestershire by National Trust workers. There was a ligature hanging from the tree above where the remains were found which implied the gentleman had committed suicide by hanging. The clothing recovered and the geographical location of this incident supported Police's theory that these were the remains of a high risk missing man who was reported missing in June 2009 by his family. The MPDD team checked the DNA from the remains against the MPDD and a match was obtained to the missing man. Despite the time elapsed since he was reported missing, his family had not given up hope that he might return home. The DNA match gave valuable closure to the family who were then able to bury his remains.

Case 4

In April 2019, the body of a male was found on a stretch of beach in the Isle of Man. It was thought the body had been in the sea for approximately one week and was aged between 60 and 100 years of age. DNA was taken from the body and uploaded to the MPDD in May 2019. A match was immediately identified with a man who had been reported missing from Cumbria in late March 2019. The missing man had mental health issues and it was believed he may have committed suicide. It is thought that he entered the water in Whitehaven Cumbria and his body had travelled across the water to the Isle of Man.

Case 5

In late December 2019, a badly decomposed body was found in the Manchester ship canal. Gender and cause of death could not be established. DNA was taken and uploaded to the MPDD. The DNA proved to be a match to a previously found leg which had been found near to this area previously. The leg had been identified as belonging to a high risk female who was reported missing in December 2017 and in locating and identifying the rest of her remains, much needed closure to family was able to be provided. They could also reconcile her remains at her burial site.

1.4.3 Vulnerable Persons DNA Database (VPDD)

The VPDD holds the DNA profile records of people who are at risk (or who consider themselves at risk) of harm (for instance due to child sexual exploitation or honour based assault) and have asked for their profile to be added. If the person subsequently goes missing, their profile can be checked against NDNAD to see if they match to any biological material (such as blood or an unidentified body found at a crime scene) helping the police to investigate their disappearance. Profile records on the VPDD are not held on NDNAD.

As at 31st March 2019, there were **5,177** records on the VPDD, as at 31st March 2020, there were **5,656** records on the VPDD. In 2018/19 and 2019/20, there were **no** requests to compare records held on the VPDD with records held on NDNAD.

1.5 Technology and business process developments on the NDNAD in 2018-2020

NDNAD is constantly being adapted to incorporate new developments in technology. This involves significant work in developing and testing these changes to ensure they meet the necessary standards. The Home Office also responds to any developments that could impact on its effectiveness.

1.5.1 Home Office Biometrics Programme

The Home Office Biometrics Programme (HOB) is a programme in the Government Major Projects Portfolio. HOB is delivering biometrics matching and identification services for the UK. HOB's focus is on three biometric modes: fingerprints, DNA and facial matching. These services enable the capture, authentication, verification, and searching and matching of individuals' biometrics and forensics for the purposes of solving crime, protecting the border, and preventing terrorism.

The HOB Strategic DNA Project is focused on delivering a replacement (with enhanced capability) IT platform for the current NDNAD, and developing international connectivity to create better links with similar databases in other countries. To make it easier to deliver, the new platform will be delivered in stages.

1.5.2 Contamination Elimination Database

The Police Elimination Database (PED) contains DNA profile records taken from police officers and staff known as "elimination profile records". Where a police force suspects that a crime scene sample may have been contaminated with DNA from a police officer, or a member of police staff, they can request that a direct comparison is made of DNA obtained from the crime scene against the Police Elimination profile. Each incident must be reported separately; FINDS (DNA) are not permitted to carry out full searches of the PED. In February 2018 changes were made to cease loading new records to the PED.

FINDS (DNA) is leading a project in developing a Contamination Elimination Database (CED). The Forensic Science Regulator recommended that a contamination elimination database be established to identify any contamination events on the NDNAD⁷⁵; this allows FINDS (DNA) to carry out regular, national, searches of crime stain profile records against elimination profile records enabling easier identification of DNA profile records that are due to contamination⁷⁶.

On load to the CED, a check is made for matches against all newly submitted crime scene profile records added to the NDNAD. Following any necessary quality assurance checks by the FSP which processed the crime scene DNA sample,

⁷⁵ The recommendation is at paragraph 8.1.5, p18 of the protocol [The Management and Use of Staff Elimination DNA Databases \(FSR-P-302\)](#) published by the FSR in 2014.

⁷⁶ This change was brought in via [The Police \(Amendment\) Regulations 2015](#) and [The Special Constables \(Amendment\) Regulations 2015](#). The regulations were signed off on 1st April 2015.

matches are investigated by police forces and any crime scene DNA profile records shown to originate from contamination by, for example, police officers or staff (rather than from the crime scene from which the DNA samples were obtained) are then deleted from NDNAD. As at 9th April 2020, 2,404 contamination events had been identified for investigation. Forces have been investigating these matches and 1,632 have been concluded. This has resulted in the removal of 1,432 unsolved crime stains from the NDNAD⁷⁷. As Law Enforcement Agencies (LEAs) conclude their investigations the number of crime stain records deleted from the NDNAD will increase.

DNA profile records taken from serving police officers and special constables are able to be retained for elimination purposes for up to 12 months after they leave a police force (except where they transfer to another force)⁷⁸. In line with the Police and Criminal Evidence Act 1984 (PACE), DNA samples will be destroyed within 6 months of the sample being taken.

From July 2018, the aforementioned standard retention, search, and reporting aspects have been integrated into the FINDS 'business as usual' activities. During 2018-20, project activities have continued with expansion of the CED to include the DNA profile records of staff where there is potential for contamination of crime scene DNA samples through the environment within which DNA sampling occurs, or consumables used within the DNA sampling and processing - there is now representation on the CED for manufacturers of products used in the DNA process, with a pilot taking place to consider Sexual Assault Referral Centre staff and Emergency Services personnel inclusion.

1.5.3 DNA mixture profile differentiation on the NDNAD

A NDNAD change was implemented on the 1st March 2018 which made it clearer to police when a clear, complete, major profile from a DNA mixed profile has been matched. The instructions tell police forces to contact the FSP for further clarification for all other DNA mixed profiles.

FINDS are now leading on further work to see if these instructions can be applied to more complicated mixed profiles.

1.6 Security and Quality Control

1.6.1 Access to NDNAD

Day-to-day operation of NDNAD is the responsibility of FINDS (DNA). Data held on NDNAD are kept securely and the laboratories that provide DNA profile records to NDNAD are subject to regular assessment.

⁷⁷ Forces deemed that following investigation the remaining 200 crime stain records could remain on the NDNAD.

⁷⁸ This change was brought in via [The Police \(Amendment\) Regulations 2015](#) and [The Special Constables \(Amendment\) Regulations 2015](#). The regulations were signed off on 1st April 2015.

FINDS (DNA) is responsible for ensuring that operational activity meets the standards for quality and integrity established by the NDNAD Strategy Board. 36 vetted staff have access to the NDNAD, this is made up of 29 with day to day operational access and 7 with system administrator access⁷⁹. No police officer or police force has direct access to the data held on NDNAD but they are informed of any matches it produces. Similarly, forensic service providers who undertake DNA profiling under contract to the police service, and submit the resulting crime scene and subject profile records for loading, do not have direct access to NDNAD.

1.6.2 Compliance to international quality standards

The Forensic Science Regulator's Codes of Practice and Conduct (version 5) states that the NDNAD is to be certificated to the IT standard, TickIT*plus*, that its operation should be certificated to the management standard ISO 9001 and its proficiency testing scheme to the technical standard ISO 17043. The Strategy Board has been informed that the hosting and maintenance of the IT systems do not currently hold the required certification to TickIT*plus*, however FINDS does hold certification to ISO 9001 and accreditation to ISO 17043.

1.6.3 Error rates

Police forces and FSPs have put in place a number of safeguards to minimise the occurrence of errors in the sampling and processing of DNA samples and the interpretation of generated DNA profiles; FINDS (DNA) carry out daily integrity checks for the DNA profile records loaded to the NDNAD. Despite these safeguards, errors do sometimes occur for samples taken from individuals and from crime scenes. The Contamination Elimination Database, which contains the profile records of police officers and staff and people in the wider DNA process, helps to reduce errors by highlighting DNA profiles that are potentially sourced from contamination. FINDS (DNA) continues to lead a project to incorporate the profile records of other professionals who might have come into contact with crime scene DNA (see paragraph 1.5.2).

There are four types of errors which may occur; these are explained below:

i. Force sample or record handling error:

This occurs where the DNA profile is associated with the wrong information, the source of the error in these cases could be either a physical DNA sample swap in the custody suite or the DNA record being attached to the incorrect Police National Computer (PNC) record. For example, if person A and person B are sampled at the same time, and the samples are put in the wrong bags with incorrect forms, person A's sample would be attached to information (PNC ID number, name etc.) about person B, and vice versa. Similarly, crime scene sample A could have information associated with it which relates to crime scene sample B and vice versa. These are all errors which have occurred during police force process.

⁷⁹ As at 05/03/20.

ii. Forensic service provider sample or record handling error:

As above, this occurs where the DNA profile is associated with the wrong information during forensic service provider process. Sources of this error include samples being mixed up as described above, or contaminating DNA being introduced during processing.

iii. Forensic service provider interpretation error:

This occurs where the forensic service provider has made an error during the analysis/interpretation of the DNA profile.

iv. FINDS (DNA) transcription or amendment error:

This occurs where FINDS (DNA) has introduced inaccurate information to the record on the NDNAD.

Tables 7 and 8 overleaf shows the error rate for subject and crime scene profile records held on NDNAD for each organisation. No known miscarriage of justice arose from these errors; they were detected by the routine integrity checks in place. However, had they remained undetected, they could have affected the integrity of the NDNAD.

Table 7: Error rates 2018/2019

Organisation	Error types	Sample Type	April to June 2018	July to September 2018	October to December 2018	January to March 2019
Profile records loaded		Subject	65,741	66,216	61,039	65,138
		Crime scene	10,098	9,137	9,479	10,075
Police Forces	Sample or record handling	Subject	43	51	46	49
		Subject (%)	0.065%	0.077%	0.075%	0.075%
Forensic Service Providers	Sample or record handling	Subject	1	0	0	3
		Subject (%)	0.002%	0.000%	0.000%	0.005%
		Crime scene	5	6	3	3
		Crime scene (%)	0.008%	0.009%	0.005%	0.005%
	Interpretation ⁸⁰	Subject	7	0	1	6
		Subject (%)	0.011%	0.000%	0.002%	0.009%
		Crime scene	20	28	15	21
		Crime scene (%)	0.198%	0.306%	0.158%	0.208%
FINDS (DNA)	Transcription or amendment	Subject	0	0	3	0
		Subject (%)	0.000%	0.000%	0.005%	0.000%
		Crime scene	0	0	1	0
		Crime scene (%)	0.000%	0.000%	0.011%	0.000%

⁸⁰ It should be noted that the percentage error rates for record/sample handling are not directly equivalent to those for interpretation: a record/sample handling error will affect a complete DNA profile while an interpretation error will affect (generally) one area of the DNA analysed by the Forensic Service provider (a single allele or locus).

Table 8: Error rates 2019/2020

Organisation	Error types	Sample Type	April to June 2019	July to September 2019	October to December 2019	January to March 2020
Profile records loaded		Subject	56,267	72,841	71,315	68,469
		Crime scene	7,318	8,305	8,044	7,632
Police Forces	Sample or record handling	Subject	51	25	38	32
		Subject (%)	0.091%	0.034%	0.053%	0.047%
Forensic Service Providers	Sample or record handling	Subject	1	0	2	0
		Subject (%)	0.002%	0.000%	0.003%	0.000%
		Crime scene	1	4	3	7
		Crime scene (%)	0.002%	0.005%	0.004%	0.092%
	Interpretation ⁸¹	Subject	1	2	1	7
		Subject (%)	0.002%	0.003%	0.001%	0.010%
		Crime scene	17	16	9	16
		Crime scene (%)	0.232%	0.193%	0.112%	0.210%
FINDS (DNA)	Transcription or amendment	Subject	0	0	0	0
		Subject (%)	0.000%	0.000%	0.000%	0.000%
		Crime scene	1	0	0	0
		Crime scene (%)	0.014%	0.000%	0.000%	0.000%

⁸¹ It should be noted that the percentage error rates for record/sample handling are not directly equivalent to those for interpretation: a record/sample handling error will affect a complete DNA profile while an interpretation error will affect (generally) one area of the DNA analysed by the Forensic Service Provider (i.e. a single allele or locus).

1.6.4 FSP accreditation

Any FSP carrying out DNA profiling work for loading to NDNAD must be approved by FINDS (DNA) and the FIND Strategy Board and must hold accreditation to ISO17025 as defined in the Forensic Science Regulator's Codes of Practice and Conduct. This involves regular monitoring of standards. As at 31st March 2019, **15** laboratories were authorised to load profile records to NDNAD from standard processing. There were two new laboratories accredited to load profiles to the NDNAD which commenced loading in 18/19. In addition to the 15 laboratories which were authorised to load profiles from standard processing there were also 4 sites which were authorised to load profiles to the NDNAD which were generated via a new process for a pilot project.

There were no new laboratories accredited to load to the NDNAD during 19/20 and the 4 sites authorised to load profiles to the NDNAD which were generated via the new process were removed from scope due to the pilot study finishing. Therefore as at 31st March 2020 the number of laboratories which were authorised to load profile records to NDNAD from standard processing remained at **15**.

1.6.5 Forensic Science Regulator

In 2008, an independent Regulator⁸² was established to set and monitor standards for organisations carrying out scientific analysis for use in the criminal justice system. The current Regulator is Dr Gillian Tully.

The required standards are published in the Regulator's Codes of Practice and Conduct⁸³ and include accreditation of FSPs and FINDS to international standards.

1.7 Finance 2018 - 2020

In 2018/19, the Home Office and policing spent **£1.80m**⁸⁴ running NDNAD on behalf of the criminal justice system.

In 2019/20, the Home Office and policing spent **£2.03m**⁸⁵ running NDNAD on behalf of the criminal justice system.

⁸² For further information on the Regulator, see www.gov.uk/government/organisations/forensic-science-regulator.

⁸³ These are available at www.gov.uk/government/collections/forensic-science-providers-codes-of-practice-and-conduct.

⁸⁴ This does not include IT costs.

⁸⁵ This does not include IT costs.

2. National Fingerprint Database

2.1 Introduction

The National Fingerprint Database and National Automated Fingerprint Identification System (NAFIS), now collectively referred to as IDENT1, was established in 1999 and holds fingerprint images obtained from persons and crime scenes by Law enforcement agencies of the United Kingdom. It provides the ability to electronically store and search fingerprint images to manage person identity and compare fingerprints from individuals with fingermarks from unsolved crimes.

2.1.1 Fingerprint records

The skin surface found on the underside of the fingers, palms of the hands and soles of the feet is different to skin on any other part of the body. It is made up of a series of lines known as ridges and furrows and this is called friction ridge detail.

The ridges and furrows are created during foetal development in the womb and even in identical siblings (twins, triplets) the friction ridge development is different for each sibling. It is generally accepted that sufficient friction ridge detail is unique to each individual, although this cannot be definitively proved.

Friction ridge detail persists throughout the life of the individual without change, unless affected by an injury causing permanent damage to the regenerative layer of the skin (dermis) for example, a scar. The high degree of variability between individuals coupled with the persistence of the friction ridge detail throughout life allows for the confirmation of identity and provides a basis for fingerprint comparison as evidence.⁸⁶

The national fingerprint database holds two types of fingerprint record:

i. Individuals.

UK Law Enforcement Agencies routinely take a set of fingerprints from all persons they arrest.

Fingerprints are usually obtained electronically on a fingerprint scanning device but are occasionally obtained by applying a black ink to the friction ridge skin and an impression recorded on a paper fingerprint form.

A set of fingerprints is known as a Tenprint and comprises:

- Impressions of the fingertips taken by rolling each finger from edge to edge.
- An impression of all 4 fingers taken simultaneously for each hand and both thumbs

⁸⁶ Cited Forensic Science Regulator Codes- Fingerprint comparison 24.3 & 24.4

- Impressions of the ridge detail present on both palms.

ii. Crime scenes

Sweat pores located along the ridges of friction ridge skin constantly exude sweat which is transferred onto surfaces when friction ridge skin comes into contact with an object. This contact leaves an invisible impression of the friction ridge detail on the surface known as a latent finger mark (or palm or barefoot print). Police Crime Scene Investigators (CSIs) examine surfaces which the perpetrator of the crime is most likely to have touched and use a range of techniques to develop latent fingerprints to make them visible. Fingerprints developed and recovered from crime scenes are searched against the fingerprints obtained from arrested persons to identify who touched the surface the fingerprints were recovered from. Latent marks can also be developed by subjecting items potentially touched by the perpetrator (exhibits) through a series of chemical processes in an accredited laboratory by sufficiently trained and competent laboratory staff.

2.1.2 Fingerprint Matches

i. Fingerprint Examination

The purpose of fingerprint examination is to compare two areas of friction ridge detail to determine whether they were made by the same person or not.⁸⁷

The comparison process is subjective in nature and the declared outcomes are based on the knowledge, training and experience of the fingerprint practitioner. The qualified practitioner gives an opinion based on their observations, it is not a statement of fact, nor is it dependent upon the number of matching ridge characteristics.⁸⁸

A process of analysis, comparison and evaluation is undertaken by the fingerprint practitioner, known as ACE this is followed by an independent verification process (ACE-V). The process is described sequentially, but fingerprint practitioners will often go back and repeat parts of the process in order to reach their conclusion.

There are four possible outcomes that will be reported from a fingerprint examination *Insufficient, Identified, Excluded or Inconclusive*.⁸⁹

⁸⁷ Cited from Forensic Science Regulator Codes – Fingerprint Comparison 24.5.1

⁸⁸ Cited from Forensic Science Regulator Codes – Fingerprint Comparison 24.5.4

⁸⁹ Cited from Forensic Science Regulator Codes – Fingerprint Comparison 24.5 – 24.11.1

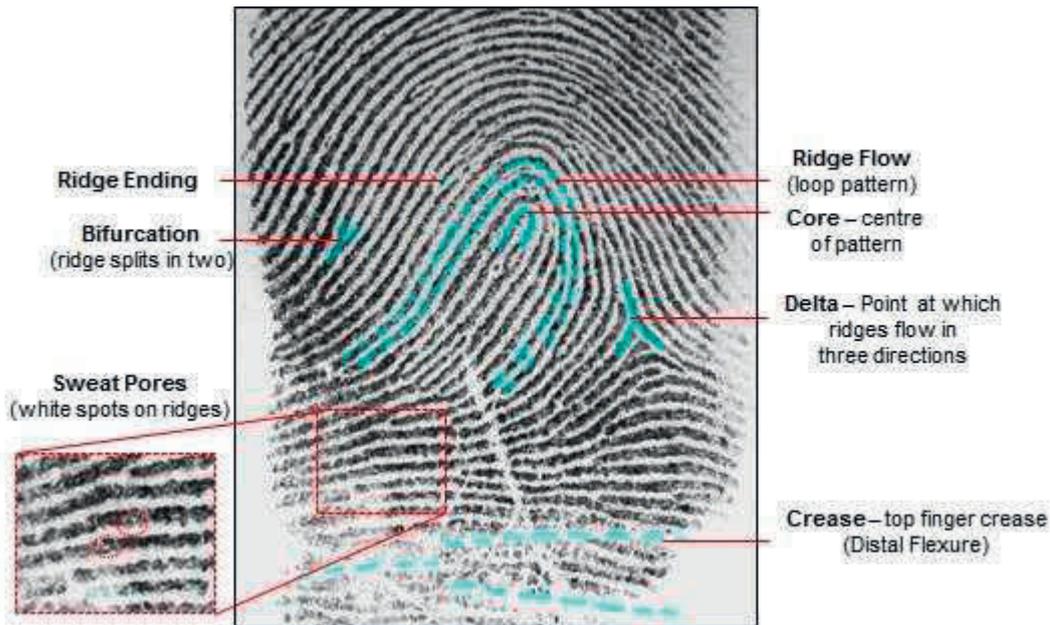


Image courtesy of Lisa J Hall, Metropolitan Police Forensic Science Services; permission to reproduce granted.

Figure 5: Friction ridge detail observable at the top of a finger. The black lines are the ridges and the white spaces are the furrows. The ridges flow to form shapes or patterns. This is an example of a loop pattern exiting to the left. There are natural deviations within the ridge flow known as characteristics such as ridge endings or forks/bifurcation. There are white spots along the tops of the ridges known as pores and there are other features present for example creases, which are normally observed as white lines.

a) Analysis

The practitioner establishes the quality and quantity of detail visible within the mark to determine its suitability for further examination by looking at ridge flow and the way ridges form shapes or patterns and how the ridges naturally deviate from their ridge paths to form characteristics such as ridge endings or forks/bifurcations. The practitioner takes into account a number of variables, for example, the surface on which the mark was left, any apparent distortion, etc.

b) Comparison

The practitioner will systematically compare two areas of friction ridge detail, for example in a print or mark with that of a print. This process consists of a side-by-side comparison to determine whether there is agreement or disagreement based upon features, in particular the sequence of ridge characteristics and spatial relationships within the tolerances of clarity and distortion. The practitioner will establish an opinion as to the level of agreement or disagreement between the sequences of ridge characteristics and features visible in both.

c) Evaluation

The practitioner will review all of their previous observations and come to a final opinion and conclusion about the outcome of the examination process undertaken.

The outcomes determined from the examination will be one of the following:

Identified to an individual: A practitioner term used to describe the mark as being attributed to a particular individual. There is sufficient quality and quantity of ridge flow, ridge characteristics and / or detail in agreement with no unexplainable differences that in the opinion of the practitioner two areas of friction ridge detail were made by the same person.

Excluded for an individual: There are sufficient features in disagreement to conclude that two areas of friction ridge detail did not originate from the same person.

Inconclusive: The practitioner determines that the level of agreement and / or disagreement is such that, it is not possible to conclude that the areas of friction ridge detail originated from the same donor, or exclude that particular individual as a source for the unknown friction ridge detail. The outcome may be inconclusive for a number of reasons; those reasons are documented in the practitioner's report.

Insufficient: The ridge flow and / or ridge characteristics revealed in the area of friction ridge detail are of such low quantity and/or poor quality that a reliable comparison cannot be made. The area of ridge detail contains insufficient clarity of ridges and characteristics or has been severely compromised by extraneous forces (superimposition, movement etc) to render the detail present as unreliable and not suitable to proffer any other decision.

Verification

Is the process to demonstrate whether the same outcome is obtained by another qualified practitioner or practitioners who conduct an independent analysis, comparison and evaluation, therefore verifying the original outcome.

2.1.3 Outcomes using Fingerprints.

The number of offenders convicted with the help of Fingerprint evidence is not recorded. However here are some examples of cases using fingerprint evidence:-

Case 1:

In July 2019 an 18-year-old man caused criminal damage to his grandfather's house. As the victim wanted to pursue a complaint, the offender – who had no criminal record at the time – was voluntarily interviewed. A postal charge was sent out and the man appeared at court where he pleaded guilty. He was given a suspended sentence and told to pay his grandfather £1,800 in compensation. Fingerprints were taken from the offender and checked against the IDENT1 database, generating a match to a stolen vehicle from an aggravated burglary a month after the criminal damage offence took place.

Case 2:

Three drug dealers jailed for more than 26 years after conspiring to sell tens of thousands of pounds worth of Class A drugs. Fingerprints recovered from the scene of a multi-million pound drug seizure helped unearth the true scale of their illegal activities.

Case 3:

An 18 year old was investigated for an incident of theft in November 2019. At the time there were no fingerprints for the individual on the IDENT1 database, as part of the investigation fingerprints were taken and checked against the IDENT1 database. His fingerprints were matched to previously unidentified finger-marks recovered from crime scenes relating to a murder investigation, Class A drugs supply and a traffic offence.

Case 4:

A man who raped and strangled a 27-year-old woman has been jailed for life with a key piece of evidence being fingerprints. The victim's body was found in a burning flat in April 2019, with a bottle of a substance used as an accelerant found at the scene featuring fingerprints. Upon search of the fingerprints recovered from the crime scene against the IDENT1 database, there was a match to the offender, which acted as evidence towards his subsequent conviction for the offences.

2.1.4 Who runs the National Fingerprint Database?

Since 2012 the National Fingerprint Database has been operated by the Home Office. Law enforcement agencies have direct access to the system and they own the data they enrol within it.

The Home Office is responsible for assuring the quality and integrity of policing data held on the National Fingerprint Database (IDENT1) and other Forensic Information Databases as described in the FIND Strategy Board rules. To discharge this function on the National Fingerprint Database, FINDS - National Fingerprint and PNC Office identify and correct data errors and unexpected results on the National Fingerprint Database. The activities of the agencies that provide the inputs to the fingerprint database and its supply chain are monitored by FINDS and included in the FINDS performance monitoring framework and data assurance strategy during 2019-2020. The data assurance strategy aims to identify any errors and to ensure continuous improvement, in line with the requirements of the international standard ISO/IEC 17025⁹⁰ and the FSR's Codes of Practice and Conduct.

⁹⁰ Once the updated search algorithm for IDENT1 has been introduced (see section 2.5), the expectation of the Forensic Science Regulator will be that the scope of accreditation will be broadened to include the use of IDENT1

2.1.5 Access to National Fingerprint database

The number of IDENT1 active users is 927. Fingerprints are captured electronically on a device called Livescan and electronically transmitted to the fingerprint database for search and the number of active Livescan accounts is 2,800 as at 27/04/2020

The FIND Strategy Board has been considering the legality and governance of a non-law enforcement agency accessing the policing collections held within IDENT1 in order to perform their national security responsibilities. This has been reported separately in the 2019 Biometrics Commissioners Report, paragraphs 96-101.

2.2 Who is on IDENT1?

2.2.1 Number of profile records held on IDENT1 System⁹¹

As at 31st March 2019, IDENT1 held **25,477,499** fingerprint forms relating to **8,240,881** individuals. Figure 6 shows the yearly number of individuals on IDENT 1. Figure 6 shows the yearly number of individuals retained on IDENT 1.

As at 31st March 2019, IDENT1 held **2,240,580** unidentified crime scene marks. Figure 8 shows the yearly number of unique unidentified mark submissions held on IDENT 1.

As at 31st March 2020, IDENT1 held **26,298,205** fingerprint forms relating to **8,397,761** individuals. Figure 6 shows the yearly number of individuals on IDENT 1. Figure 6 shows the yearly number of individuals retained on IDENT 1.

As at 31st March 2020, IDENT1 held **2,203,279** unidentified crime scene marks. Figure 8 shows the yearly number of unique unidentified mark submissions held on IDENT 1.

Table 9. Records held on IDENT 1

Month End and Year	Number of Individuals on IDENT1	Number of Fingerprint Identification Forms held on IDENT 1	Number of unidentified crime scene marks held on IDENT1
March 2011	8,471,960	19,906,978	1,896,885
March 2012	8,759,820	21,303,201	1,971,938
March 2013	9,006,957	22,508,260	2,029,028
March 2014	7,578,717	21,702,050	2,110,962
March 2015	7,695,129	22,571,529	2,303,565
March 2016	7,814,041	23,364,390	2,318,576
March 2017	7,905,419	24,059,907	2,285,669
March 2018	8,012,521	24,822,939	2,259,139
March 2019	8,240,881	25,477,499	2,240,580
March 2020	8,397,761	26,298,205	2,203,279

⁹¹ Source: FINDS - National Fingerprint and PNC Office in consultation with the IDENT1 supplier

Figure 6: Number of individuals on IDENT 1 (in millions) (March 2011 to March 2020)^{92 93}

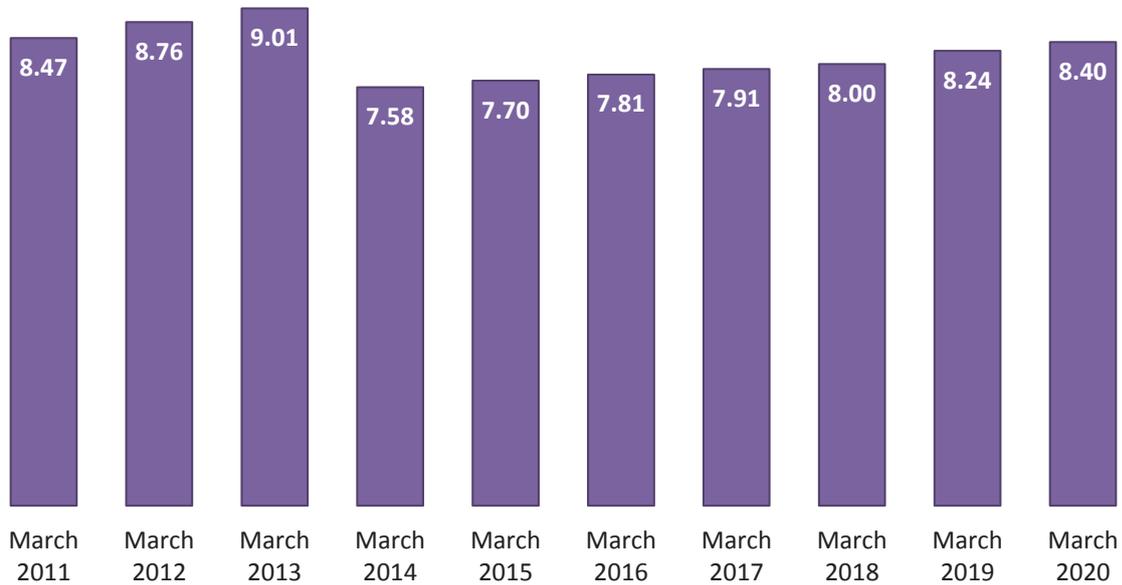
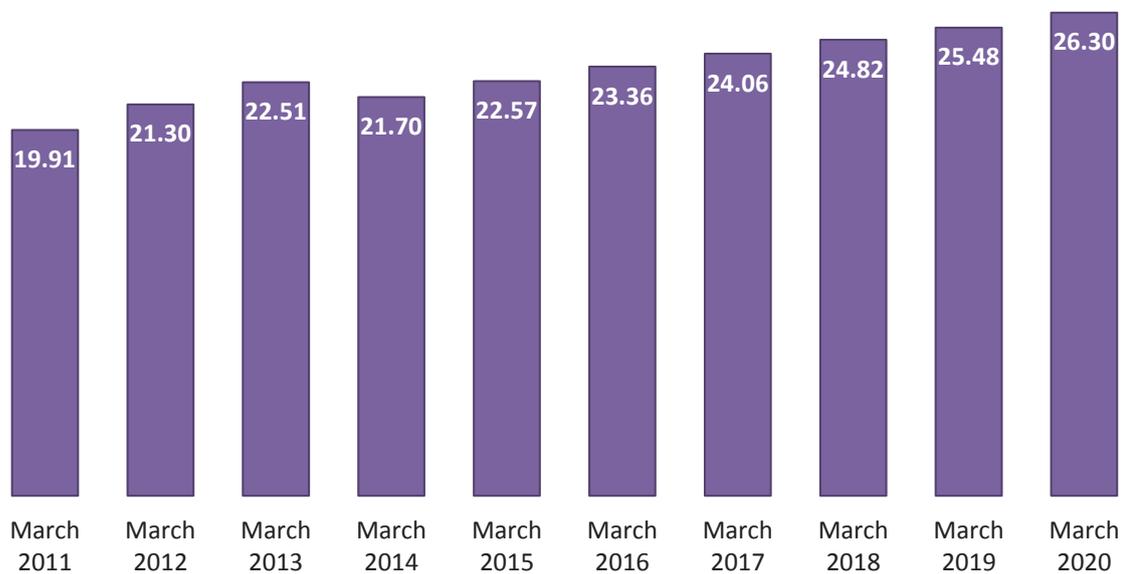


Figure 7: Number of Fingerprint Forms Held for all Subjects on IDENT1 (in millions) (March 2011 to March 2020)⁹⁴

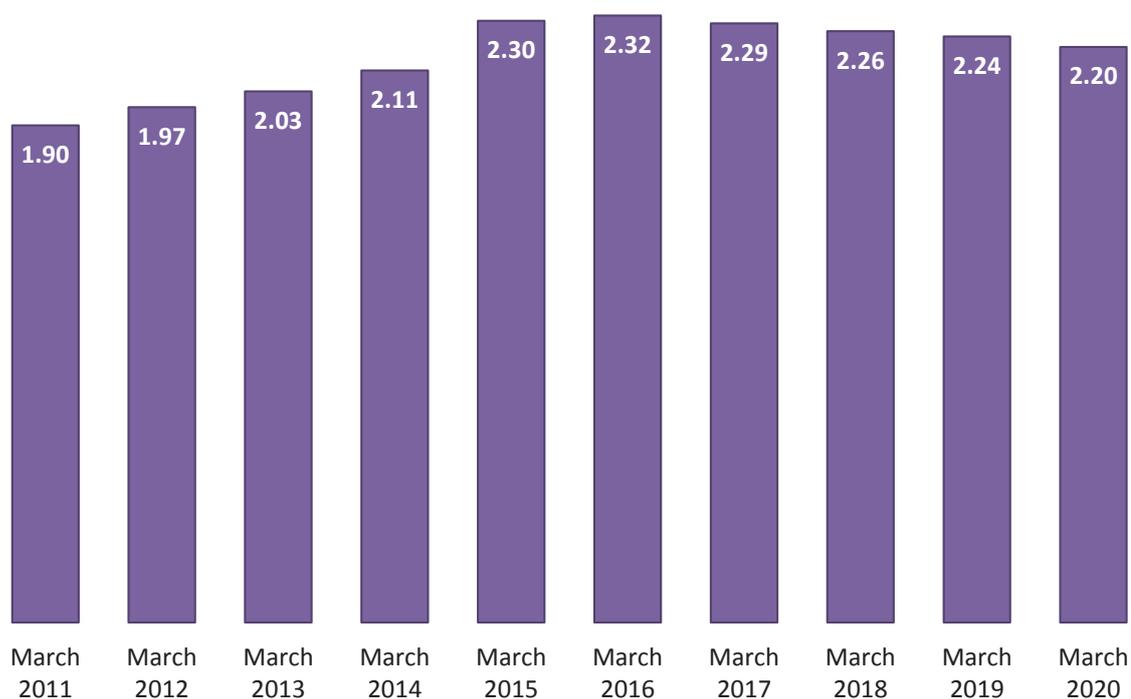


⁹² Source: FINDS - National Fingerprint and PNC Office in consultation with the IDENT1 supplier

⁹³ The deletion of records which did not meet the retention criteria for records brought in by PoFA was completed during 13/14 hence the drop in the number of criminal records held for subjects on IDENT 1.

⁹⁴ Source: FINDS - National Fingerprint and PNC Office in consultation with the IDENT1 supplier

Figure 8: Number of unique unidentified mark submissions held on IDENT 1 (in millions) (March 2010 to March 2019) ⁹⁵



2.3 Vulnerable persons

The National Fingerprint Database contains fingerprints obtained with consent from vulnerable persons, specifically those defined at risk of honour based assault, forced marriage or female genital mutilation. The taking of fingerprints and DNA samples is a key protective measure advised by the NPCC guidance to practitioners. This is a two-fold measure, aimed at addressing identification issues in potential investigations and to protect potential victims from serious acts of violence, abduction and homicide.⁹⁶ Fingerprints donated by vulnerable persons are stored on the national fingerprint database and as such provide means to identify a vulnerable person when they come to police notice.

There were 6,386⁹⁷ sets of fingerprints relating to vulnerable people held on the database as at 31st March 2019.

There were 7,156⁹⁸ sets of fingerprints relating to vulnerable people held on the database as at 31st March 2020.

⁹⁵ Source: FINDS - National Fingerprint and PNC Office in consultation with the IDENT1 supplier

⁹⁶ 1.5 – ACPO Guidance on Taking of Fingerprints, DNA & Photographs of Victims / Potential Victims of Forced Marriage – Handling Procedures

⁹⁷ FABrIC Service Performance Monitoring Report (April 2017 Service Period)

⁹⁸ FABrIC Service Performance Monitoring Report (April 2017 Service Period)

2.4 Missing persons

Fingerprints relating to unidentified bodies, and unidentified or missing persons investigations are searched on the National Fingerprint Database in an attempt to establish identity or locate a missing person. Where the investigation allows the fingerprints obtained are stored in the Missing Persons Fingerprint Collection and as such are only searchable by request. Fingerprints obtained from the belongings of a missing person are also searched against both the National Fingerprint Collection and the Missing Persons Fingerprint Collection to assist with police investigations and to help to bring closure for the family of the missing person.

There were 102 print sets relating to missing persons held on the database as at 31st March 2019. There were four Fingerprint identifications for Missing Persons Unit (MPU) cases during 18/19

There were 199 print sets relating to missing persons held on the database as at 31st March 2020. There were 5 Fingerprint identifications for MPU cases during 19/20

Case 1.

This case relates to an individual who went missing from Derby in 1991. He told family he was going away for two weeks in April 1991 and had not been seen since. He took few clothes or belongings with him. In August/ September 2018, a male deceased body was found in a house in Ireland. A passport was found at the address, which indicated who the person might be. In September 2018, an Interpol request from Interpol Dublin was received with the fingerprints of the unidentified male body and a scanned copy of a passport found on his person. A direct comparison was made between these prints and the prints stored for the individual on IDENT1 and it established that they were a match. Family were consequently notified.

Case 2.

This case refers to an individual who went missing from the UK in June 2017. The gentleman had never been formally reported as missing by his family as it was quite normal for him have sporadic contact. In July 2017, the body of a male was found on the balcony of a bungalow in Alicante, Spain after having committed suicide. Shortly afterwards, an Interpol request from Interpol Madrid was received to check both the fingerprints and DNA from the body. The fingerprints were first sent as high priority for a comparison against IDENT 1 and a match was obtained. A later DNA comparison was also made in July 2018 and the match was further confirmed. The police force attended the home address on August 2018 and notified the parents that their son had been identified as having died in Alicante. Further support was provided by the missing persons unit and the Foreign and Commonwealth Office.

Case 3.

In May, an email was received from Interpol Madrid to assist with identifying a male who had been found deceased in Santa Cruz de Tenerife in May 2019. Fingerprints of the right and left hands were provided by the Spanish authorities for a comparison to be made. DNA was also taken from the body. The Spanish authorities believed they belonged to a French gentleman. When they were searched against IDENT1, it was established they were a match to a different UK national. A message has now been sent to inform the Spanish authorities.

2.5 Technology and business process developments on the National Fingerprint Database in 2018/19 & 2019/20

As discussed in section 1.5.1, HOB is delivering biometrics matching and identification services for the UK.

Programme highlights in relation to fingerprints over the last 2 years include:

- Roll out of Non Verified Live ID (NVLID) fingerprint check in Scottish custody suites enabling a live fingerprint identity check at as is already available in English and Welsh custody suites. NVLID also offers the ability to search arrestee fingerprints from custody against fingerprints attached to Schengen alerts (wanted or missing people amongst Schengen member states)⁹⁹ which includes subjects wanted on European Arrest Warrants, and the UK Immigration and Asylum Biometric System. NVLID has rollout to Police Scotland and is contributing to efficiencies in fingerprint processing.
- Completion of the migration of arrestee fingerprints obtained by Police Service of Northern Ireland into the UK fingerprint database.
- Continued to roll out the replacement strategic mobile biometric capability to police forces across England and Wales. This capability allows officers in the field to verify identities by using an app on their corporate smart phone to search both the law enforcement and immigration fingerprint databases. 27 police forces and Immigration Enforcement are operational. There have been notable successes including identifying individuals wanted for murder and kidnap, aiding rapid identification of bodies and resolving cases in the field. It also is an enabler for increased efficiency by avoiding the need to spend time returning to the custody suite for both officers and members of the public. Due to its success, police forces currently using the technology are planning to significantly increase their number of devices and additional police forces plan to deploy the capability.

⁹⁹ State that is operating the Schengen Information System

- Delivering and expanding access to UK Law Enforcement Fingerprint Bureaus to search fingermarks recovered from scenes of crime against the Immigration and Asylum Biometric database (IABS). During 2018 /19 there were 3,439 crime scene mark to IABS person searches from law enforcement resulting in 19 identifications. The capability was made available to all UK Police fingerprint bureaus during 2019. During 2019/20 there were 16,419 searches, resulting in 134 identifications. Some examples of cases are below:

CASE 1:

During investigation of cultivation of cannabis, a search of fingermarks recovered from cannabis growing equipment was identified to an IABS subject additional to a suspect arrested fleeing from the scene. The IABS subject does not have prints on IDENT1 and would have gone undetected.

CASE2:

Following a fingerprint identification of a foreign national first arrested in 2019 to a fingermark recovered from a drugs case in 2017, the remaining marks recovered from the scene were searched against IABS, and a further foreign national identified. Additionally, a search of a foreign national against IDENT1 for a new IABS subject was identified to another mark in the same case. Three Foreign National Offenders (FNO) in total have been identified to one drugs case.

CASE3:

Following a fire at a flat, a badly decomposed body was found and identified within an hour following search of fingerprints of the body against IABS. The case is being investigated as a murder. Search of IABS enabled identification of the victim quickly and prevented significant fingerprint efforts to search and compare fingerprint against those held on IDENT1.

- HOB has awarded the contract for both of the UK's biometric services (IDENT1 used by law enforcement and Immigration and Asylum Biometrics System (IABS) supports immigration, borders and HMPO) to a single supplier to manage both services which will bring efficiencies and cost effectiveness.

Future developments

- HOB is delivering the capability to search fingermarks and subjects with Prüm member states in Summer 2020 (Subject to EU approval)¹⁰⁰. This will be rolled out incrementally country by country.
- A new fingerprint matching algorithm will improve performance of the IDENT1 automated fingerprint identification system and continues to be developed by the Home Office Biometrics Programme. It will also result in less time preparing

¹⁰⁰ See section 3.3

marks for searches (less manual encoding) and reduce the number of potential matches the experts need to check. The new fingerprint matcher platform has been evaluated and will be operational during 2020/21 and through a staged release will rationalise the fingerprint matching capability for both IDENT1 and the Immigration and Asylum Biometric System (IABS).

An individual's biometric information is very sensitive personal information and is handled in accordance to the Data Protection Act 2018. To ensure transparency, HOB completes Data Protection Impact Assessments for all areas of the Programme, these are subject to independent ethical review by the BFEG and it continues to review the assessments already published on GOV.UK.¹⁰¹

2.5.1. Transforming Forensics

In addition to working with HOB to develop new capability FINDS are also working with the Transforming Forensics programme. Transforming Forensics (TF) is a national transformation programme supported and overseen by the National Police Chiefs' Council. Funded by the Home Office, it was established in 2017. In February 2020, TF received further investment to continue the development of the Fingerprint capability, accelerate innovation and help combat crime across England and Wales. TF aims to give practitioners new technologies, automation for large-scale data processing and more efficient workflows, and a new focus on digital forensics.

Current developments

- TF is creating a series of complex fingerprint tools that will allow fingerprint practitioners to compare fingerprint images and record the comparison and identification process and decision. The tools have been designed, developed and tested with the support and input of fingerprint subject matter experts and are at an advanced stage. They will be deployed initially in South-West forces during 2020/21, with wider rollout to other forces to follow after that.
- TF is also developing capabilities and processes to allow law enforcement fingerprint bureau to share their workloads allowing for easier distribution of case work and to reduce the time for fingerprint evidence to be examined.
- TF and FINDS are developing a national ground truth database which will contain fingerprint and fingermarks records from volunteers. This database of known

¹⁰¹ <https://www.gov.uk/government/publications/home-office-biometrics-hob-programme-privacy-impact-assessments>

source fingerprint images will allow law enforcements fingerprint bureau and the Home Office to test and validate performance of the fingerprint system and fingerprint practitioners.

3. International Data exchange

3.1 Overview

DNA and fingerprints are exchanged with international other countries to aid criminal investigations and in connection to a missing person or unidentified body investigations. All exchanges must abide by national and international law and all exchanges of DNA and Fingerprint data are made via National Crime Agency (NCA) UK International Crime Bureau.

3.2 International requests for DNA & Fingerprint exchange

DNA

FINDS - DNA recorded 149 requests for exchange of DNA profiles from the UK to other countries during 2018/19. 119 of these were in connection with a criminal investigation and 37 were released in connection to a missing person or unidentified body part(s) investigation.

FINDS - DNA recorded 164 requests for exchange of DNA profiles from the UK to other countries during 2019/20. 134 of these were in connection with a criminal investigation and 30 were released in connection to a missing person or unidentified body part(s) investigation.

FINDS – DNA Unit recorded 709 requests from other countries for DNA profiles from their jurisdictions to be searched against the NDNAD during 2018/19. 458 of these were in connection with a criminal investigation and 251 were in connection to a missing person or unidentified body part(s) investigation.

FINDS – DNA Unit recorded 505 requests from other countries for DNA profiles from their jurisdictions to be searched against the NDNAD during 2019/20. 312 of these were in connection with a criminal investigation and 193 were in connection to a missing person or unidentified body part(s) investigation.

Fingerprints

The FINDS – Fingerprints Unit does not release Tenprints or fingermarks for international exchange with other countries.

FINDS - Fingerprints has recorded 107 requests for search of fingerprints from other countries during 2018/19. 4 of these were in connection with a criminal investigation, 81 were in connection to a missing person or identification/unidentified body investigation and 22 were released under an agreement with the United Kingdom Missing Persons Unit¹⁰²

¹⁰² There is not enough information to be able to break this 22 down by category

FINDS - Fingerprints has recorded 101 requests from other countries for search of fingerprints from their jurisdictions during 2019/20. 1 of these were in connection with a criminal investigation, 92 were in connection to a missing person or identification/unidentified body investigation and 8 were released under an agreement with the United Kingdom Missing Persons Unit¹⁰³

3.3 Prüm

The Prüm Council Decisions establish the European Union system for the automated bulk exchange of DNA profiles, fingerprints and vehicle registration data between EU Member States to improve cross-border cooperation between law enforcement agencies to combat terrorism and cross-border crime. Prüm operates on a point to point connection between member states. For the exchange of DNA profiles and fingerprints, Prüm is a two-step system. Step one is an anonymised search of biometric data against EU Member State databases looking for a hit-no hit result. Step two involves the sharing of demographic data (e.g. name, date of birth) where there has been a match against the anonymised data.

DNA Profile Exchange

The Prüm DNA exchanges to and from the UK commenced in July 2019.

Since going live with Prüm DNA exchanges, the UK has connected to EU Member States to maximise the operational benefits of matching unsolved DNA crime scene 'stains' with European data stores. The UK's connection to Prüm DNA has produced positive results for both the UK and the EU partners connected to so far. The UK is now connected to Austria, Germany, France, the Netherlands, Spain, Romania, Poland, the Czech Republic and Ireland. From searches of historic data held on the UK's national DNA database, the UK has received around 13,000 initial 'hits' from its Prüm DNA connections. In turn, EU Member States have received approximately 47,000 initial hits from their connections with the UK.¹⁰⁴

The UK will continue to connect to EU Member States for Prüm throughout 2020/21.

Fingerprints

The UK is ready to 'go live' with exchanging fingerprint data under Prüm, following a positive peer evaluation and unanimous support from the EU Member States. The evaluation of the UK's Prüm fingerprints architecture concluded that the UK's work on Prüm fingerprints was professional and structured; and that the UK's legislation was

¹⁰³ There is not enough information to be able to break this 8 down by category

¹⁰⁴ Figures provided are between going live and 30 March 2020.

fit for purpose. The UK will seek to finalise the EU approval process during 2020. This consists of a series of votes in the European Parliament and the European Council.

Future Exchange

The UK's current access to Prüm is provided for during the transition period under the Withdrawal Agreement between the EU and the UK. Access beyond the transition period is subject to negotiation on a future security relationship. The UK and the EU have both confirmed an interest in agreeing the UK's continued access to Prüm under the future security relationship.

Accreditation of Forensic Service Providers Regulations

The UK passed the Accreditation of Forensic Service Providers Regulations 2018 in order to bring the UK regulations in line with the EU Prüm requirements. This legislation ensures that domestically collected DNA and fingerprint evidence is recognised at an international standard, which further enhances our ability to combat terrorism and cross border crime. UK agencies engaged or planned to be engaged in DNA and Fingerprint Prüm exchange are all accredited.

4. Legislation governing DNA and Fingerprint retention

4.1 Overview

Protection of Freedoms Act 2012 (PoFA) and the Anti-Social Behaviour, Crime and Policing Act 2014 (ASBCPA) amended Police and Criminal Evidence Act 1984 (PACE) to establish the current retention framework for DNA and fingerprints.

4.2 Protection of Freedoms Act 2012

4.2.1 Introduction

PoFA includes detailed rules on how long the police may retain an individual's DNA sample, profile and fingerprints.

4.2.2 DNA profile records and fingerprints

Depending on the circumstances, a DNA profile and fingerprint record may be retained indefinitely, held for three to five years and then destroyed, or destroyed immediately.

4.2.3 DNA samples

PoFA requires all DNA samples taken from individuals to be destroyed as soon as a profile has been obtained from them (or in any case within 6 months) unless it is retained under the Criminal Procedure and Investigations Act 1996 (CPIA)¹⁰⁵. This allows sufficient time for the sample to be analysed and a DNA profile to be produced and uploaded to NDNAD.

4.2.4 Biometrics Commissioner

PoFA also established the position of Commissioner for the Retention and Use of Biometric Material ('the 'Biometrics Commissioner')¹⁰⁶. The position is independent of Government. The current Biometrics Commissioner is Professor Paul Wiles.

As indicated in Table 6b, one of the Biometrics Commissioner's functions is to decide whether or not the police may retain DNA profile records and fingerprints obtained from individuals arrested but not charged with a qualifying offence. He also has a general responsibility to keep the retention and use of DNA and fingerprints, and retention on national security grounds, under review.

¹⁰⁵ Under the Criminal Procedure and Investigations Act 1996 (CPIA) (and its associated code of practice) evidence can be retained where it may be needed for disclosure to the defence. This means that, in complex cases, a DNA sample may be retained for longer. This sample can only be used only in relation to that particular offence and must be destroyed once its potential need for use as evidence has ended.

¹⁰⁶ For more information on the work of the Biometrics Commissioner see <https://www.gov.uk/government/organisations/biometrics-commissioner>.

4.2.5 Extensions

Where an individual has been arrested for, or charged with, a qualifying offence and an initial, three year period, of retention, has been granted, PoFA allows a chief constable to apply to a district judge for a two year extension of the retention period if the victim is under 18, a vulnerable adult, is associated with the person to whom the retained material relates or if they consider retention to be necessary for the prevention or detection of crime.

4.2.6 Speculative searches

PoFA allows the DNA profile and fingerprints taken from arrested individuals to be searched against NDNAD and IDENT1, to see if they match any subject or crime scene profile already stored. Unless a match is found, or PoFA provides another power to retain them (for example because the person has a previous conviction) the DNA and fingerprints are deleted once the 'speculative search' has been completed. If there is a match the police will decide whether to investigate the individual or not.

Table 6a: Retention periods for convicted individuals

Situation	Fingerprint & DNA Retention Period
Any age convicted (including given a caution or youth caution) of a qualifying offence	Indefinite
Adult convicted (including given a caution) of a minor offence	Indefinite
Under 18 convicted (including given a youth caution) of a minor offence	1st conviction: five years (plus length of any prison sentence), or indefinite if the prison sentence is for five years or more. 2nd conviction: indefinite

Table 6b: Retention periods for unconvicted individuals

Situation	Fingerprint & DNA Retention Period
Any age charged with but not convicted of a qualifying ¹⁰⁷ offence	Three years plus a two year extension if granted by a District Judge (or indefinite if the individual has a previous conviction for a recordable ¹⁰⁸ offence which is not excluded)
Any age arrested for but not charged with a qualifying offence	Three years if granted by the Biometrics Commissioner plus a two year extension if granted by a District Judge (or indefinite if the individual has a previous conviction ¹⁰⁹ for a recordable offence which is not excluded ¹¹⁰)
Any age arrested for or charged with a minor ¹¹¹ offence	None (or indefinite if the individual has a previous conviction for a recordable offence which is not excluded)
Over 18 given a Penalty Notice for Disorder	Two years

¹⁰⁷ A 'qualifying' offence is one listed under section 65A of the Police and Criminal Evidence Act 1984 (the list includes sexual, violent, terrorism and burglary offences).

¹⁰⁸ A 'recordable' offence is one for which the police are required to keep a record. Generally speaking, these are imprisonable offences; however, it also includes a number of non-imprisonable offences such as begging and taxi touting. The police are not able to take or retain the DNA or fingerprints of an individual who is arrested for an offence which is not recordable.

¹⁰⁹ Convictions include cautions, reprimands and final warnings.

¹¹⁰ An 'excluded' offence is a recordable offence which is minor, was committed when the individual was under 18, for which they received a sentence of fewer than 5 years imprisonment and is the only recordable offence for which the individual has been convicted.

¹¹¹ A minor offence is a 'recordable' offence which is not also a 'qualifying' offence.

4.3 Early Deletion

PoFA requires the FIND Strategy Board to issue guidance about the destruction of DNA profile records¹¹². This guidance, known as the 'Deletion of Records from National Police Systems', covers DNA profile records and samples, fingerprints and PNC records and it was first published in May 2015¹¹³. The guidance is only statutory in relation to DNA profile records and only applies to those:

- with no prior convictions, whose biometric material is held because they have been given a Penalty Notice for Disorder;
- who have been charged with, but not convicted of, a qualifying offence; or
- who receive a simple or conditional caution.

The guidance states that Chief Officers may wish to consider early deletion if applied for on specified grounds. These include:

- a recordable offence has not taken place (e.g. where an individual died but it has been established that they died of natural causes);
- the investigation was based on a malicious or false allegation;
- the arrested individual has a proven alibi;
- the status of the individual (e.g. as victim, offender or witness) is not clear at the time of arrest;
- a magistrate or judge recommends it;
- another individual is convicted of the offence; and
- where it is in the public interest to do so.

The Record Deletion Process provides an application form and specifies the evidence that the Chief Officer should consider, this application form is available on GOV.uk.¹¹⁴

¹¹² As set out under section 63AB(4) of the Police and Criminal Evidence act 1984 (PACE) as inserted by section 24 of PoFA.

¹¹³ Deletion of Records from National Police Systems guidance is available at <https://www.gov.uk/government/publications/dna-early-deletion-guidance-and-application-form>

¹¹⁴ The Record Deletion Process is available at <https://www.gov.uk/government/publications/dna-early-deletion-guidance-and-application-form>.

Glossary

Accreditation: This is the independent assessment of the services that an organisation delivers, to determine whether they meet defined standards.

All Forensic Service Providers and laboratories which process DNA samples and fingerprints are required to be accredited to ISO/IEC 17025; a standard set out by the International Standard Organization which requires that samples are processed under appropriate laboratory conditions and that contamination is avoided.

Anti-Social Behaviour Crime and Policing Act 2014 (ASBCPA): ASBCPA amended PACE to make three changes in the operation of PoFA, namely in relation to retention of samples under the Criminal Procedures and investigations act (CPIA), retention of profile records not linked to the offence for which a DNA sample was taken and resampling. See 'Protection of Freedoms Act 2012'.

Biometrics and Forensics Ethics Group¹¹⁵: The DNA Ethics Group was established in 2007 and in July 2017 it was replaced by the Biometrics and Forensics Ethics Group; the Ethics Group is an independent group which provides advice to ministers and the Strategy Board on ethical issues associated with all forensic identification techniques.

Contamination Elimination Database: A database containing profile records from police officers, police staff, manufacturers and others who come into regular contact with crime scenes or evidence, so that any DNA inadvertently left at a crime scene can be eliminated from the investigation.

Commissioner for the Retention and Use of Biometric Material ('the Biometrics Commissioner'): The Biometrics Commissioner is responsible for keeping under review the retention and use by the police of DNA samples, DNA profile records and fingerprints; and for agreeing or rejecting applications by the police to retain DNA profile records and fingerprints from persons arrested for qualifying offences but not charged or convicted for up to three years.

Crime scene investigator (CSI): A member of police staff employed to collect samples which may contain DNA and other forensic evidence left at a crime scene.

Deoxyribonucleic Acid (DNA): Genetic material contained within most of the cells of the human body which determines an individual's characteristics such as sex, eye colour, hair colour etc.

DNA-17: The current method used to process a DNA sample which analyses a sample of DNA at 16 different areas plus a sex marker.

DNA profile: A series of pairs of numbers (16 pairs where the DNA-17 method is used) plus a sex marker which are derived following the processing of a DNA sample. There are two types of DNA profile records:

- **crime scene profile:** this is a profile derived from a crime scene sample
- **subject profile:** this is a profile derived from a subject sample

¹¹⁵ <https://www.gov.uk/government/organisations/biometrics-and-forensics-ethics-group>

Once derived, profile records are usually loaded onto the National DNA Database. See 'DNA sample'.

DNA sample: There are two main types of DNA sample:

- **crime scene sample:** this is a sample of DNA taken from a crime scene e.g. from a surface, clothing or bodily fluid (such as blood) left at a crime scene.
- **subject sample:** this is a sample of DNA taken from an individual, often from their cheek, by way of a 'buccal swab' though it can be taken from hair or a bodily fluid such as blood, urine or semen.

In the case of missing persons, DNA samples may also be taken from the belongings of that person or their family for the purposes of identifying a body should one be found.

Early deletion: The Record Deletion Guidance sets out certain, limited, circumstances under which an individual whose DNA profile is being retained by the police can apply to have it destroyed sooner than normal.

Excluded offence: Under the retention framework for DNA and fingerprints, an 'excluded' offence is a recordable offence which is minor, was committed when the individual was under 18, for which they received a sentence of fewer than five years imprisonment and is the only recordable offence for which the individual has been convicted.

Familial search: A search of NDNAD to look for relatives of the perpetrator carried out where DNA is found at a crime scene but there is no subject profile on NDNAD. Such a search may produce a list of possible relatives of the offender. The police use other intelligence, such as age and geography, to narrow down the list before investigating further.

Because of the privacy issues, cost and staffing involved in familial searches, they are only used for the most serious crimes. All such searches require the approval by the Chair of the FIND Strategy Board (or a nominee of the Chair).

Force sample or record handling error: This occurs where the DNA profile is associated with the wrong information. For example, if person A and person B are sampled at the same time, and the samples are put in the wrong kits, so person A's sample is attached to information (PNC ID number, name etc.) about person B, and vice versa. Similarly, crime scene sample A could have information associated with it which relates to crime scene sample B.

Forensic Archive Ltd. (FAL): A company established following the closure of the Forensic Science Service (FSS), to manage case files from investigation work which it had carried out. See 'Forensic Science Service'.

Forensic Information Database Service (FINDS): The Home Office unit responsible for administering NDNAD, Fingerprint Database and Footwear database.

Forensic Information Database (FIND) Strategy Board: The FIND Strategy Board provides governance and oversight over NDNAD and the Fingerprint Database. It has a number of statutory functions including issuing guidance on the destruction of profile records and producing an annual report.

Forensic service provider (FSP): An organisation which provides forensic analysis services to police forces.

FSP interpretation error: This occurs where the FSP has made an error during the processing of the sample.

FSP sample and/or record handling error: As above, this occurs where the DNA profile is associated with the wrong information. It could involve samples being mixed up as described above or contaminating DNA being introduced during processing.

Forensic Science Regulator¹¹⁶: The Regulator is responsible for ensuring that the provision of forensic science services across the criminal justice system is subject to an appropriate regime of scientific quality standards. Although her remit applies only to England and Wales, the Scottish and Northern Irish authorities collaborate with her in the setting of quality standards.

Forensic Science Service (FSS): The FSS was the body which used to have responsibility for most forensic science testing in relation to forensic evidence. In March 2012, the FSS closed and its work was transferred to private forensic service providers and in-house police laboratories.

Match: There are three types of matches:

- **crime scene to subject:** Where a crime scene profile matches a subject profile
- **crime scene to crime scene:** Where a crime scene profile matches another crime scene profile (i.e. indicating that the same individual was present at both crime scenes).
- **subject to subject:** Where a subject profile matches a subject profile already held on NDNAD (i.e. indicating that the individual already has a profile on NDNAD).

Match rate: The percentage of crime scene profile records which, once loaded onto NDNAD, match against a subject profile (or subject profile records which match to crime scene profile records).

Minor offence: Under the retention framework for DNA and fingerprints, a minor offence is a 'recordable' offence which is not a 'qualifying' offence.

Missing Persons DNA Database (MPDD): The MPDD holds DNA profile records obtained from the belongings of people who have gone missing or from their close relatives (who will have similar DNA). If an unidentified body is found which matches

¹¹⁶ <https://www.gov.uk/government/organisations/forensic-science-regulator>

their description, DNA can be taken from it and run against that on the MPDD to see if there is a match. This assists with police investigations and helps to bring closure for the family of the missing person. Profile records on the MPDD are not held on NDNAD.

National DNA Database (NDNAD): A database containing both subject and crime scene profile records connected with crimes committed throughout the United Kingdom. (Subject profile records retained on the Scottish and Northern Irish DNA Databases are copied to NDNAD; crime scene profile records retained on those databases are copied to NDNAD if a match is not found).

Non-Routine search: A search made against a DNA profile which has not been uploaded onto NDNAD.

FINDS transcription or amendment error: This occurs where FINDS have introduced inaccurate information.

Partial match: Where, for instance, the perpetrator has tried to remove the evidence, or DNA has been partially destroyed by environmental conditions, it may not be possible to obtain a complete DNA profile from a crime scene. A partial DNA profile can still be used to obtain a partial match against profile records on NDNAD. Partial matches provide valuable leads for the police but, depending on how much of the information is missing, the result is likely to be interpreted with lower evidential weight than a full match. See 'Match'.

Police and Criminal Evidence Act 1984 (PACE): PACE makes a number of provisions to do with police powers, including in relation to the taking and retention of DNA and fingerprints.

Protection of Freedoms Act 2012 (PoFA): Prior to the coming into force of the DNA and fingerprint sections of PoFA on 31st October 2013, DNA and fingerprints from all individuals arrested for, charged with or convicted of a recordable offence were held indefinitely. PoFA amended PACE to introduce a much more restricted retention schedule under which the majority of profile records belonging to innocent people were destroyed. See 'Police and Criminal Evidence Act 1984 (PACE)'.

Qualifying offence: Under the retention framework for DNA and fingerprints, a 'qualifying' offence is one listed under section 65A of the Police and Criminal Evidence Act 1984 (the list comprises sexual, violent, terrorism and burglary offences).

Recordable offence: A 'recordable' offence is one for which the police are required to keep a record. Generally speaking, these are imprisonable offences; however, it also includes a number of non-imprisonable offences such as begging and taxi touting. The police are not able to take or retain the DNA or fingerprints of an individual who is arrested for an offence which is not recordable.

SGMPlus: The previous method used to process a DNA sample which analysed a sample of DNA at ten different areas plus a sex marker. In July 2014, SGMPlus was upgraded to DNA-17.

Routine search: A search made against a DNA profile uploaded onto NDNAD.

Urgent match: A search made using FINDS's urgent speculative search service which is available 24 hours a day. This service is reserved for the most serious of crimes.

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