



# **National DNA Database Strategy Board Annual Report 2016/17**



# **National DNA Database Strategy Board Annual Report 2016/17**

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

July 2018



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## **Ministerial Foreword**

This report sees the inclusion of information on the National Fingerprint Database in addition to the National DNA Database following the expansion of the governance role of the NDNAD Strategy Board to cover fingerprints in addition to DNA. This was initiated following the publication of the Government's Forensic Science Strategy.

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 2016/17 the NDNAD provided 31,743 routine matches, including to 514 homicides and 612 rapes, and 493 urgent matches, including to 122 homicides and 141 rapes. This is an increase in the number of matches reported in the previous year, demonstrating the continued effectiveness of the NDNAD. The percentage of crime scene profiles which matched a subject profile on load to the NDNAD (referred to as the match rate) was 66%. This is an increase from 63% compared to the previous two years, further showing the effectiveness of the NDNAD in helping police to solve crime.

Work on the Home Office Biometrics (HOB) DNA Strategic Project has continued this year. This project will deliver a replacement platform on which the NDNAD will sit with enhanced functionality and increased international capability, creating better links with similar databases in other countries.

**Baroness Susan Williams**

**Minister of State for Countering Extremism and Minister for Equalities**



## Chair of the Strategy Board's Foreword

I am pleased to present this report as the Chair of the Forensic Information Database (FIND) Strategy Board, having previously chaired the National DNA Database Strategy Board between 2007 and 2011. Bringing the governance of the National Fingerprint Database under the Strategy Board is an important step in supporting the aims of the Government's strategy for forensic science including clearer and more transparent governance.

Throughout the year, substantial work has been undertaken to bring the governance of the Fingerprint database under this board and to align the management of this function with that for DNA. This work has enabled stronger links between these functions and clearer oversight of them. This report contains data on the National Fingerprint database; this data will be expanded and developed in the coming years.

The Contamination Elimination Database project has continued to progress this year as has the development of rapid DNA technology with several pilots being undertaken.

The Home Office Biometrics Programme project to deliver a replacement to the technology on which NDNAD is based has continued at pace this year. Once complete, the new technology will enable NDNAD and the National Fingerprint Database to make better links with the comparable database in other countries enabling the police, not just in this country, but abroad, to bring even more offenders to justice.

The match rate of the NDNAD has risen again this year to 66% demonstrating the NDNAD's continuing effectiveness as a tool for policing.

**Gary Pugh**

A handwritten signature in black ink that reads "Gary Pugh". The signature is written in a cursive style with a large, looped 'G' and 'P'.

**Chair of the Forensic Information Database (FIND) Strategy Board**

## The Forensic Information Database Strategy Board

Governance and oversight of the National DNA Database<sup>1</sup> is provided by the Forensic Information Database (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 31<sup>st</sup> October 2013, the Board has operated on a statutory basis.<sup>2</sup> The Board has a number of functions:

- 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)<sup>3</sup>;
- it may issue guidance about the circumstances under which applications for retention under PoFA<sup>4</sup> may be made to the Commissioner for the Use and Retention of Biometric Material ('The Biometrics Commissioner')<sup>5 6</sup>;
- it must publish governance rules which must be laid before Parliament<sup>7</sup>; and
- it must make an annual report to the Home Secretary about the exercise of its functions<sup>8</sup>.

The governance rules<sup>9</sup> set out in more detail the way in which the Board operates, these are being rewritten to reflect the change in remit of the Board, and include its objectives<sup>10</sup> which are to implement strategy and policy to ensure that:

- 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
  - the identification of a deceased person.
- the public are aware of the governance, capability and limitations of the NDNAD and fingerprint databases so that confidence is maintained in its use across all communities;

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<sup>1</sup> As set out under section 3 of the governance rules.

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

<sup>3</sup> Section 63AB(2), Police and Criminal Evidence Act 1984.

<sup>4</sup> Ibid 2, section 63G.

<sup>5</sup> Ibid 2., section 63AB(4).

<sup>6</sup> The Biometrics Commissioner's latest annual report is available at:

<https://www.gov.uk/government/publications/biometrics-commissioner-annual-report-2017>

<sup>7</sup> Ibid 2, section 63AB(6).

<sup>8</sup> Ibid 2, section 63AB(7).

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

<sup>10</sup> As set out under section 4 of the governance rules.

- 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 members<sup>11</sup> include:

- the Chair of the DNA Ethics Group<sup>12 13</sup>
- the Information Commissioner (or representative);
- the Forensic Science Regulator<sup>14</sup> (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.

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<sup>11</sup> As set out under section 5 of the governance rules .

<sup>12</sup> 20th July 2017 DNA ethics group was replaced by Biometrics and Forensics Ethics Group (BFEG)

<sup>13</sup> The Ethics group annual report is available at The report is available at: [The 2016 National DNA Database Ethics Group annual report has been published - GOV.UK](#)

<sup>14</sup> The Regulator's latest annual report is available at: <https://www.gov.uk/government/publications/biometrics-commissioner-annual-report-2017>

## The Biometrics and Forensics Ethics Group

The NDNAD Ethics Group was established in 2007; an independent group that was set up to provide advice to Ministers and the Strategy Board on the ethical operation of NDNAD. On 20<sup>th</sup> July 2017 the NDNAD Ethics Group was replaced by the Biometrics and Forensics Ethics Group (BFEG) following recommendations made within the Triennial Review of Home Office Science Bodies. The remit of the BFEG expands beyond that of the NDNAD Ethics Group and includes ethical issues associated with all forensic identification techniques including, but not limited to, facial recognition technology and fingerprinting. The final Annual Report of the NDNAD Ethics Group was published on 30<sup>th</sup> October 2017<sup>15</sup>.

In its report, the future work plan for the Ethics Group was outlined;-

- To ensure that all police and supplier databases containing biometric information are subject to robust governance requirements and to provide ethical advice on their operations.
- To provide support and advice on ethical matters to the Biometrics Commissioner and others as required, including police forces.
- To embed new governance arrangements and responsibilities for the EG in light of the findings of the Triennial Review of the Group<sup>15</sup>.
- To develop a set of principles and ethical values to be considered by the EG when undertaking ethical reviews for the use and retention of biometric identifiers.
- To continue to monitor and assess potential disproportionate or discriminatory effects that the use and operation of biometric databases may have on ethnic minority groups and vulnerable people.
- To review the policies and safeguards that are developed if the UK rejoins Prüm and to ensure that the international exchange of biometric information is ethical.
- To continue to monitor the treatment of children and young people in relation to DNA and fingerprint sampling and retention to ensure that they are safeguarded and their distinct rights are recognised.
- To monitor the development of Next Generation Sequencing (DNA) technologies and their applications for the investigation of crimes.
- To monitor developments and consider the ethical issues surrounding rapid DNA testing at crimes scenes.
- To monitor the retention and use of custody images and the implementation of governance structures.
- To monitor the implementation of elimination databases.
- To monitor the review of errors in the DNA supply chain.

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<sup>15</sup> The report is available at: [The 2016 National DNA Database Ethics Group annual report has been published - GOV.UK](#)

- To review the annual report of the FIND Strategy Board and other policy and consultation documents prepared by the Home Office.
- To review policy on NDNAD access and usage and review opportunities for research using the NDNAD.

# 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 2017, it produced **643,149**<sup>16</sup> matches to unsolved crimes.

### 1.1.2 DNA profile records

NDNAD holds two types of DNA profile:

#### i. Individuals

The police 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), who look 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 men<sup>17</sup>) 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; the chance of two people having identical profile records is less than one in a billion<sup>18</sup>. 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.

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<sup>16</sup> This figure includes matches between individuals and crime scenes and between different crime scenes.

<sup>17</sup> 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.

<sup>18</sup> 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'. This is to ensure that the courts continue to understand the likelihood that the DNA found could match to a different individual than the one on trial. Certain cases might be reported with a more precise probability; this is assessed on a case-by-case basis.

## ii. Crime scenes

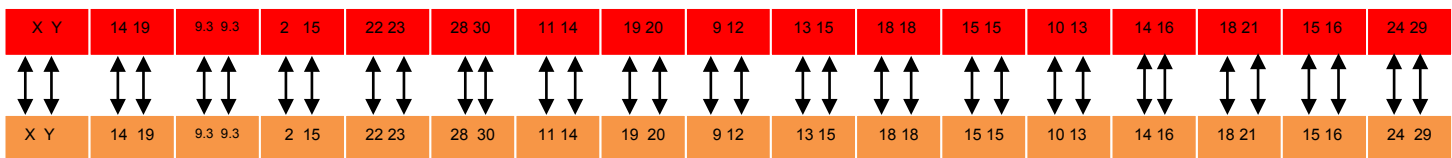
DNA is recovered from crime scenes by police Crime Scene Investigators (CSIs). Nearly every cell in an individual's body contains a complete copy of their DNA so there are many ways in which an offender may leave their DNA behind at a crime scene (for example, in blood or skin cells left on clothing 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, they 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 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 (in red) and a crime scene profile (in orange).

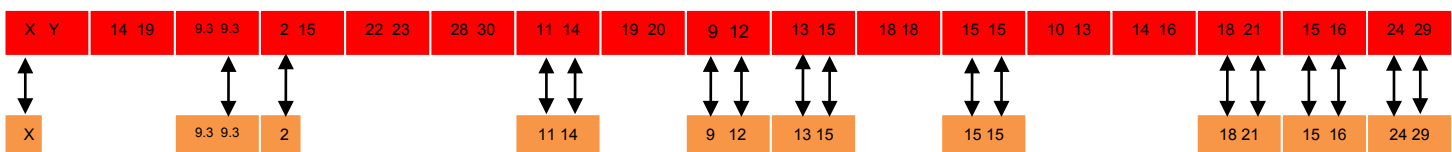


Where a match is made, this indicates that the individual may be a suspect in the police's investigation of the crime. It may also help to identify a witness or eliminate other people from the police investigation.

#### 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 (in red) and a crime scene profile (in orange).



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 less certainty 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 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 FINDS Strategy Board. A total of **22** familial searches were carried out in 2016/17.

### 1.1.5 Identical siblings

The inherited nature of DNA means that identical siblings will share the same DNA profile. 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 31<sup>st</sup> March 2017, **8,875** sets of identical twins and **12** sets of identical triplets have been identified on the NDNAD.

### 1.1.6 Who runs NDNAD?

Since 1<sup>st</sup> October 2012, NDNAD has been run by the Home Office on behalf of UK police forces. 39<sup>19</sup> vetted Home Office staff have access to it. Police forces own the profile records on the database, and receive notification of any matches, but they do not have access to it.

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<sup>19</sup> This includes 12 administration accounts.



## 1.2 Who is on NDNAD?

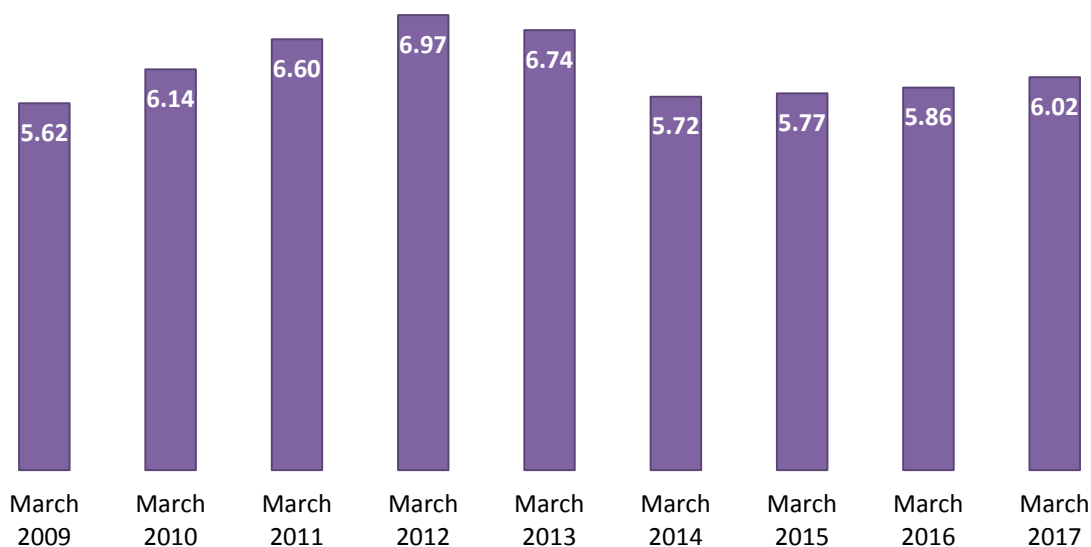
### 1.2.1 Number of profile records held on and deleted from NDNAD

As at 31<sup>st</sup> March 2017, NDNAD held **6,024,032** subject profile records and **555,362** crime scene profile records. In 2016/17, **269,489** new subject profile records were loaded to NDNAD, together with **40,829** new crime scene profile records.

Some individuals have more than one profile on NDNAD. This can occur where the force choose to load another record or where they are sampled twice under different names. **12.7%**<sup>20</sup> of the profile records on NDNAD are duplicates of an individual already sampled. Allowing for these duplicates, the estimated number of individuals on NDNAD is **5,258,600**.

In 2016/17, **165,874** subject profile records were deleted from NDNAD (including **106** under the 'Deletion of Records from National Police Systems guidance ('the Record Deletion Guidance'); see '2.4 Early Deletion'). Additionally, **5,004** crime scene profile records were deleted.

**Figure 1: Number of subject profile records held on NDNAD (in millions) (2008/09 to 2016/17)**<sup>21 22 23</sup>

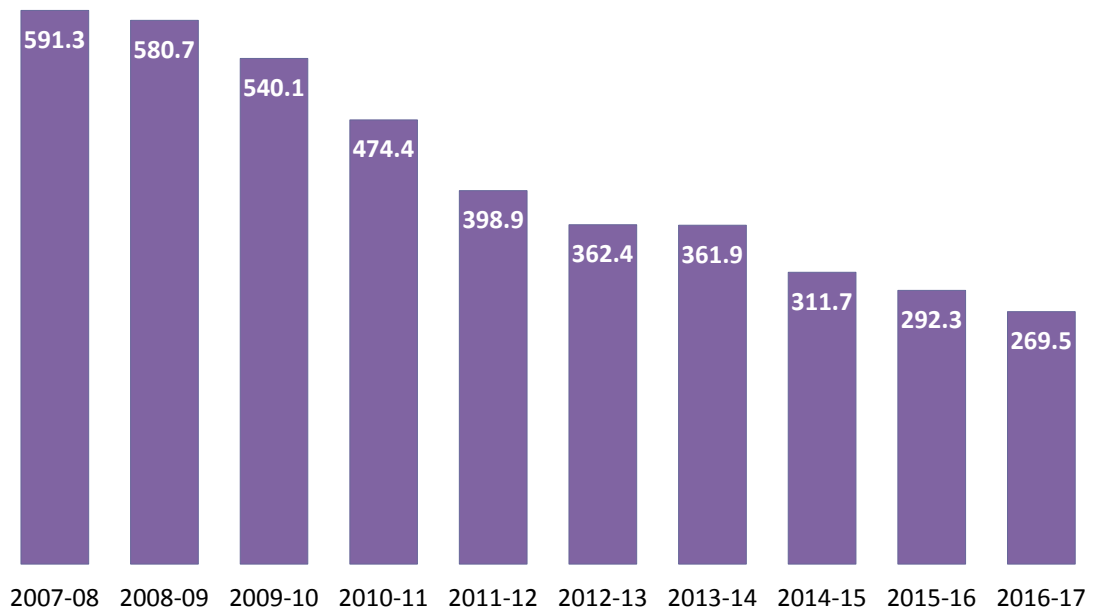


<sup>20</sup> This figure is based on the assumption that a subject profile record that matches a second subject profile record is one individual (unless determined to belong to identical twins or triplets).

<sup>21</sup> Source: NDNAD management information.

<sup>22</sup> 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.

**Figure 2a: Number of subject profile records loaded onto NDNAD per year (in thousands) (2008/09 – 2016/17)<sup>24 25 26</sup>**

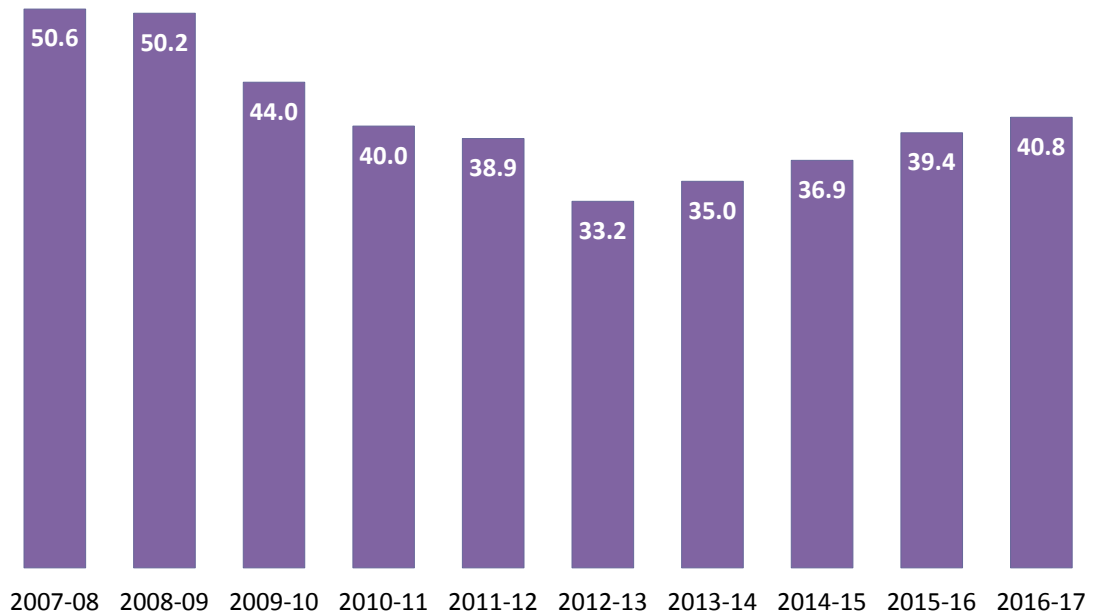


<sup>24</sup> Due to technical difficulties accessing the management information system used to record data on NDNAD, the figures for 2014/15, 2015/16 & 2016/2017 has been calculated using a different methodology from previous years.

<sup>25</sup> There are some NDNAD profile records held for which the load date is unknown; these are not included in these figures.

<sup>26</sup> Source: NDNAD management information.

**Figure 2b: Number of crime scene profile records loaded onto NDNAD per year (in thousands) (2008/09 – 2016/17) <sup>27</sup> <sup>28</sup>**



<sup>27</sup> Source: NDNAD management information.

<sup>28</sup> Due to technical difficulties accessing the management information system used to record data on NDNAD, the figures for 2014/15, 2015/16 & 2016/2017 has 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 (2016/17)<sup>29 30 31</sup>**

Crime type	Number of crime scene profile records loaded	Proportion of total number of crime scene profile records loaded (%)
Burglary (including aggravated)	16,705	42.8%
Vehicle Crime	6,359	16.3%
Criminal Damage	2,610	6.7%
Violent Crime	2,151	5.5%
Drugs	1,964	5.0%
Robbery	1,736	4.5%
Theft	830	2.1%
Rape	795	2.0%
Murder (including attempted) and manslaughter	670	1.7%
Traffic (including fatal)	632	1.6%
Firearms	527	1.4%
Other sexual offences <sup>27</sup>	290	0.7%
Arson and fire investigations	225	0.6%
Fraud	228	0.6%
Public Order	169	0.4%
Abduction and kidnapping	132	0.3%
Blackmail	20	0.1%
Explosives	11	<0.1%
Other	2,947	7.6%
<b>TOTAL</b>	<b>39,001</b>	<b>100%</b>

<sup>29</sup> Source: NDNAD management information.

<sup>30</sup> Offence types are recorded by forensic staff processing the DNA sample and do not correspond to police recorded crime codes.

<sup>31</sup> 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 PoFA<sup>32</sup>. 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 2: Number of subject and crime scene profile records retained on NDNAD by nation (as at 31<sup>st</sup> March 2017)<sup>33 34</sup>**

Nation	Subject profile records	Crime scene profile records	TOTAL
England <sup>35</sup>	5,174,097	507,520	5,681,617
Scotland	294,578	17,527	312,105
Wales	326,062	22,639	348,701
Northern Ireland	137,232	5,446	142,678
Other <sup>36</sup>	92,063	2,230	94,293
<b>TOTAL</b>	<b>6,024,032</b>	<b>555,362</b>	<b>6,579,394</b>

## 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.

<sup>32</sup> Scotland and Northern Ireland have their own retention regime.

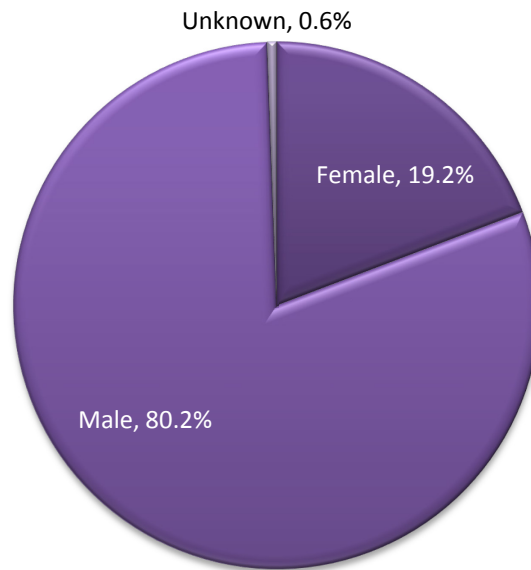
<sup>33</sup> Source: NDNAD management information.

<sup>34</sup> NDNAD does not hold individuals' addresses. The geographical information provided is based on the location of the police force that submitted the profile record.

<sup>35</sup> Includes the British Transport Police

<sup>36</sup> 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.

**Figure 3a: Proportion of subject profile records on NDNAD by sex (as at 31<sup>st</sup> March 2017)<sup>37</sup>**

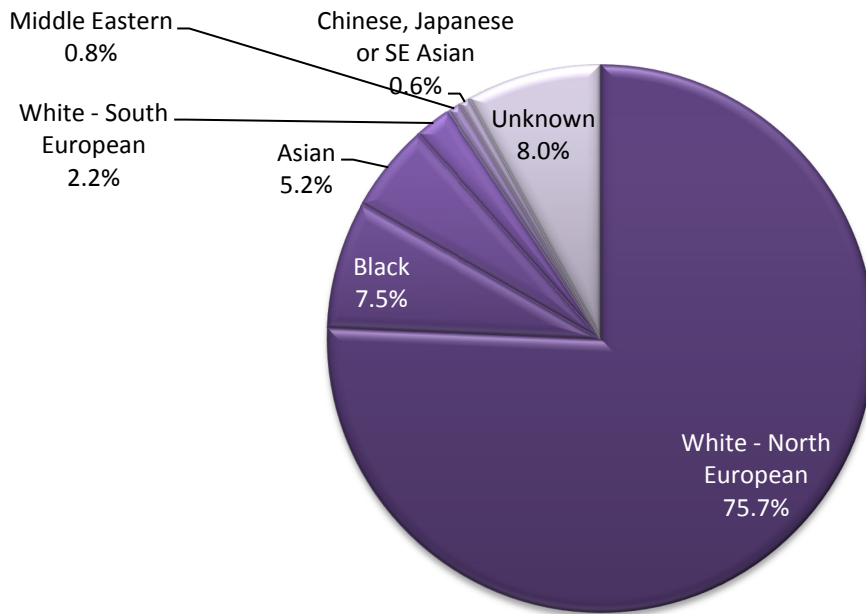


**Figure 3b: Number of subject profile records on NDNAD by ethnicity, as determined by the sampling officer (as at 31<sup>st</sup> March 2017)<sup>38 39</sup>**

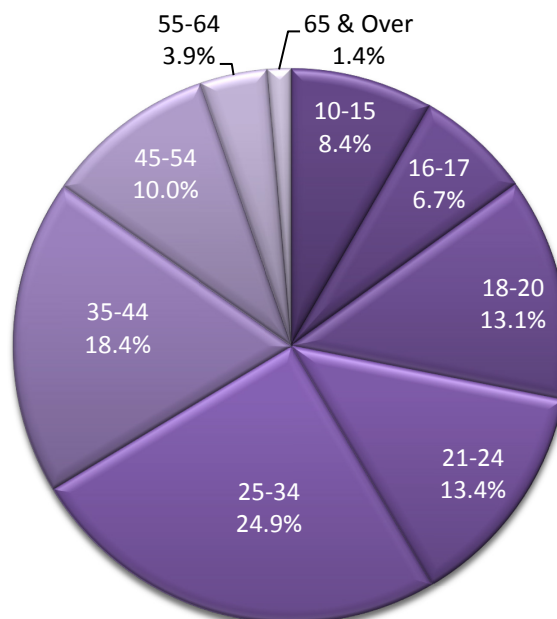
<sup>37</sup> Source: NDNAD management information.

<sup>38</sup> Source: NDNAD management information.

<sup>39</sup> 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.



**Figure 3c: Number of subject profile records by age at time of loading onto NDNAD (as at 31<sup>st</sup> March 2017)<sup>40 41</sup>**



These data are published quarterly on NDNAD web page on [www.gov.uk](http://www.gov.uk)<sup>42</sup>. The age of criminal responsibility in England and Wales is 10; there was 1 profile from a children aged under 10 on NDNAD. This was a Scottish Sample which was taken from a 'Vulnerable person' (an individual who was believed to have the potential to

<sup>40</sup> Source: NDNAD management information.

<sup>41</sup> This is calculated from the date of birth provided by the individual to the police officer at the time of arrest.

<sup>42</sup> The data are available at: [www.gov.uk/government/organisations/home-office/series/dna-database-documents](http://www.gov.uk/government/organisations/home-office/series/dna-database-documents)

come to harm and / or go missing) and was loaded with appropriate consent and authorisation for retention and searching on the NDNAD.



## 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 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 3a 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 profile<sup>43</sup> (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 table 3b and those made following urgent searches in table 3c.

### 1.3.3 Match rate

#### i. Overall match rates

In 2016/17, the chance that a crime scene profile, once loaded onto NDNAD, matched against a subject profile stored on NDNAD was **66.0%**<sup>44</sup>. This match rate has increased year on year as the Database grows better. It does 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.

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 31<sup>st</sup> March 2017, there were **192,155**<sup>45</sup> crime scene profile records on NDNAD that had not yet been matched.

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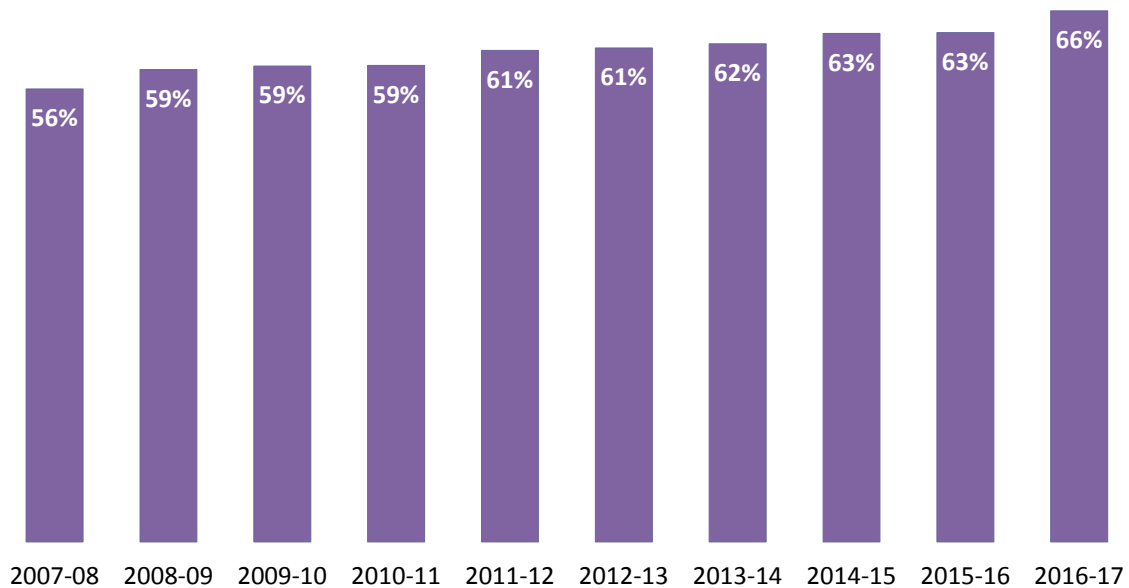
<sup>43</sup> The profile record may either be from DNA-17 (i.e. 16 numbers plus a sex marker) or from the previous system SGMPlus (i.e. 10 numbers plus a sex marker).

<sup>44</sup> Excludes crime scene to crime scene matches.

<sup>45</sup> 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.

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 4: Match rate on loading a crime scene profile (2003/04 to 2016/17)<sup>46</sup>**



## ii. Number of matches

In 2016/17, NDNAD produced **318** subject to crime scene matches following on from an urgent search of NDNAD, including to **80** homicides and attempted murders<sup>47</sup> and **91** rapes. It also produced **31,743** routine subject to crime scene matches, including to **514** homicides<sup>48</sup> and **652** rapes. It provided **1,456** crime scene to crime scene matches (this information is useful in helping to identify serial offenders). It also provided **2,664** partial matches following a non-routine search. Although a partial match has less evidential value than a full match, it can nonetheless provide the police with useful intelligence about a crime.

<sup>46</sup> Source: NDNAD management information.

<sup>47</sup> This includes murder and manslaughter.

<sup>48</sup> Due to issues with the NDNAD Management Information system in 2014/15, matches were counted at sample (rather than case level) in this year.

**Table 3a: Number of routine subject to crime scene matches made by crime type (2016/17)<sup>49 50 51</sup>**

<b>Crime</b>	<b>Matches</b>
Burglary (including aggravated)	12,801
Vehicle crime	5,345
Criminal damage	2,333
Violent crime	1,823
Drugs	1,583
Robbery	1,402
Theft	754
Rape	652
Murder (including attempted) and manslaughter	514
Traffic (including fatal)	604
Firearms	442
Other sexual offences	198
Arson and fire investigations	172
Fraud	174
Public order	145
Abduction and kidnapping	112
Blackmail	12
Explosives	19
Other <sup>52</sup>	2,658
<b>TOTAL</b>	<b>31,743</b>

<sup>49</sup> Source: NDNAD management information.

<sup>50</sup> Offence types are recorded by forensic staff processing the DNA sample and do not correspond to police recorded crime codes.

<sup>51</sup> 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.

<sup>52</sup> Includes other volume, serious and terrorism offences.

**Table 3b: Number of non-routine search matches made by crime type (2016/17)<sup>53</sup>**

<b>Crime</b>	<b>Searches</b>	<b>Matches</b>	<b>Matches (%)</b>
Burglary (including aggravated)	1,357	761	56%
Vehicle crime	641	390	61%
Criminal damage	90	54	60%
Violent crime	226	142	63%
Drugs	260	182	70%
Robbery	372	208	56%
Theft	86	56	65%
Rape	359	184	51%
Murder (including attempted) and manslaughter	193	114	59%
Traffic (including fatal)	26	22	85%
Firearms	185	113	61%
Other sexual offences	160	80	50%
Arson and fire investigations	26	11	42%
Fraud	27	17	63%
Public Order	11	5	46%
Abduction and kidnapping	32	13	41%
Blackmail	3	1	33%
Explosives	6	4	67%
Other <sup>54</sup>	946	307	33%
<b>TOTAL</b>	<b>5,006</b>	<b>2,664</b>	<b>53%</b>

<sup>53</sup> Source: NDNAD management information.

<sup>54</sup> Includes other volume, serious and terrorism offences.

**Table 3c: Number of urgent non-routine search matches by crime type (2016/17)<sup>55</sup>**

<b>Crime</b>	<b>Searches</b>	<b>Matches</b>	<b>Matches (%)</b>
Burglary (including aggravated)	54	42	78%
Vehicle Crime	3	3	100%
Criminal Damage	12	11	92%
Violent Crime	12	9	75%
Drugs	2	1	50%
Robbery	34	28	82%
Theft	0	0	0%
Rape	141	91	65%
Murder (including attempted) and manslaughter	122	80	66%
Traffic (including fatal)	3	1	33%
Firearms	8	6	75%
Other sexual offences	22	8	36%
Arson and fire investigations	5	2	40%
Fraud	2	2	100%
Public Order	21	11	52%
Abduction and kidnapping	12	7	58%
Blackmail	4	0	0%
Explosives	1	0	0%
Other <sup>56</sup>	35	16	46%
<b>TOTAL</b>	<b>493</b>	<b>318</b>	<b>65%</b>

<sup>55</sup> Source: NDNAD management information.

<sup>56</sup> Includes other volume, serious and terrorism offences..

### 1.3.4 Conviction rates

The number of offenders convicted with the help of DNA evidence is not recorded. However, DNA evidence is instrumental<sup>57</sup> in the conviction of the perpetrators of many serious crimes. For example:-

#### **Attempt Rape – 13 yr old victim - 1986 (An Op Scisco case).**

In 1986 there was an attempted rape of a 13 year old schoolgirl in Oxford. The case remained undetected until the Review Team reopened the case – during the review further DNA work produced an almost full profile. There were no hits on the NDNAD and it was speculatively searched annually.

In June 2015 Spriggs was convicted of an unconnected intra familial rape and was sentenced to 17 years. In October of that year, the annual spec search was done and a hit was found against the 1986 attempt rape. The match probability was eventually 1:69 Million.

Authority was also sought from the CPS to determine whether it was in the public interest to pursue the case, bearing in mind Spriggs's 17 year sentence. Once this authority had been granted, the Review Team then built the file as there were no statements. All that was in existence was the original HOLAB forms and the scientists statements.

Spriggs was interviewed but answered 'No Comment'. It was proved by enquiries that he was living in the Oxford area at the time of the attempted rape. He pleaded not guilty at trial but was convicted. The only 'live' evidence at the trial was the uncontested evidence of the forensic scientist.

Having been convicted in May 2017, Spriggs received a further 12 years imprisonment, to be served consecutively to the original 17 year sentence.

#### **An aggravated burglary in a caravan - 2017.**

During an aggravated burglary the victim disturbed the offenders and shot one of them dead with a shotgun. The second burglar fled the scene. Further enquiries led to the second suspect but he denied any involvement. However the following DNA evidence allowed detectives to put together a very compelling case against the second suspect who continued to deny his involvement right up to the trial.

- Plastic cable ties left in a rucksack at the scene (next to the dead body) had DNA from the second suspect on them
- DNA was also found inside a 'scarecrow' which the suspects had brought to the scene to scare the victim.
- A machete which was discarded close to the scene had DNA/blood from the second suspect – believed to have been brought to the scene and then dropped
- Wearer DNA was found inside a coat from the suspect's home address during a search which he was seen wearing on CCTV and which had deposits of gunshot residue – placing him at the scene of a shooting.

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<sup>57</sup> Prosecutions are very rarely based on DNA evidence alone.

Despite previously denying his involvement in this offence the suspect finally pleaded guilty and was sentenced to 13 years imprisonment for aggravated burglary in December 2017. The occupant was convicted of a firearm offence.

### **Op Maxwell**

On 5th November 2016 ambulance received a call in Norwich regarding a male who had been stabbed. This male appeared to have been stabbed with an unknown weapon which had resulted in his death at the scene. Initial indications were that the weapon had pierced the victim's heart.

A male was seen by a witness to leave the scene immediately after the offence. This male is described as wearing a black hoodie with a motif thereon.

A knife was subsequently found in a bin a short distance from the scene (500-600m) by bin men, handed to officers and secured by CSI. The knife was submitted to the lab and the deceased's blood found on one end and suspects cellular on the handle, this was a key piece of evidence for the prosecution.

The suspect appeared at Norwich Crown Court where he was sentenced to 20 years imprisonment for the brutal murder of the victim who was found dead outside his flat after being stabbed six times.

### **Op Graduate**

Saturday 5 August 2017 at 10.45am, a member of the public calls the Norfolk control room to report the discovery of the body of a man in woodland on a dog walking route just outside East Harling, Norfolk. It's reported by the member of the public that he has large wounds on his neck. The man's injuries are so severe that officers initially think he could have been attacked by an animal.

The man is identified as an 83-year-old male who had been walking his two dogs, who were found nearby by the informant. The death is initially treated as unexplained. A Home Office post-mortem concluded that the victim had died from multiple stab wounds to his neck and head, and a murder enquiry is launched.

During the initial scene examination and subsequent post mortem, cellar DNA samples were recovered from the victims trousers, these samples were examined and two mixed DNA profiles derived. One of the profiles was loaded to the NDNAD for a speculative search, no matches were obtained.

An intelligence officer working in the Major Investigation Team (MIT) takes information, initially called in by an anonymous person, naming a man as responsible. From this, the MIT are able to develop an intelligence profile. This intelligence package results in significant findings leading to the SIO raising the man to suspect status and overnight a firearms authority is granted for his arrest.

He was not known to Police prior to his arrest and DNA was not held for him on the NDNAD. When arrested relevant biometric samples were taken, whilst still in custody urgent comparisons of Alex Palmer's profile with the outstanding mixed profile from the victims trousers were completed. The suspect Alex Palmer's DNA profile was fully represented in the mixture.

During examinations of the suspect's house, a grey jacket was recovered from his bedroom, when examined at the lab a number of microscopic blood flakes were observed. These blood flakes were combined and a mixed DNA profile derived, when compared with the suspect and the victim, both were fully represented in the mixture. The suspect claims in his interview that he had been in the area because he was in a low mood and stated he had spent time in East Harling as a child with his family and often went there. He denied ever meeting the victim and claims he didn't enter the east side of the heath where the victim's body was found.

He is unanimously found guilty by the jury, who take only 44 minutes to reach their verdict after hearing the evidence (which included the DNA) presented to them. He is sentenced to life imprisonment and ordered by Mr Justice Goose QC to serve a minimum of 28 years in jail.



## 1.4 Missing and Vulnerable Persons Databases

### 1.4.1 Missing and vulnerable people

NDNAD holds DNA profile records taken from arrested individuals and crime scenes. Previously, it also held profile records taken in relation 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 held for identification purposes (which are given with consent), those taken from individuals who have been arrested are now held on their own databases.

### 1.4.2 Missing Persons 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 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.

As at 31<sup>st</sup> March 2017, there were **1,826** records on the MPDD. In 2016/17, the MPDD produced **seven** matches.

### 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 violence) 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 31<sup>st</sup> March 2017, there were **4,048** records on the VPDD. In 2016/17, there were **no** requests to compare records held on the VPDD with records held on NDNAD.

## 1.5 Technology and business process developments in 2016/17

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 has existing biometrics<sup>58</sup> systems whose contracts come to an end in 2019. The Home Office Biometrics (HOB) programme aims to evolve these systems to provide continuity beyond 2019 and enhance their capability through a number of phases. The HOB programme will provide a common Home Office capability which will facilitate greater efficiency in the way that biometric services are delivered to users in the wider Public Sector. In particular, the HOB programme provides biometric capability across law enforcement, border security and for UK passports (HMPO) for the purposes of solving crime, protecting the borders, preventing terrorism and enabling growth.

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

### 1.5.2 Contamination Elimination Database

The current 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.

FINDS (DNA) is currently leading a project in developing a Contamination Elimination Database (CED). The Regulator has recommended that a contamination elimination database be established to identify any contamination events on the NDNAD<sup>59</sup>; this will allow 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 contamination<sup>60</sup>.

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<sup>58</sup> ‘Biometrics’ are physiological characteristics of an individual (e.g. DNA, fingerprints, palm prints etc.) which may be used to identify them.

<sup>59</sup> 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.

<sup>60</sup> This change was brought in via [The Police \(Amendment\) Regulations 2015](#) and [The Special Constables \(Amendment\) Regulations 2015](#). The regulations were signed off on 1<sup>st</sup> April 2015.

On transfer of a PED profile record to the CED, a check is made for matches against crime scene profile records retained on NDNAD. Following any necessary quality assurance checks by the FSP which processed the crime scene sample, matches are investigated by police forces and any crime scene profile records shown to originate from contamination by police officers or staff (rather than from the crime scene from which the DNA samples were obtained) are then deleted from NDNAD. As at 31<sup>st</sup> March 2017, 1,084 contamination events had been identified for investigation. Forces have been investigating these matches and 443 have been concluded. This has resulted in the removal of 332 unsolved crime stains from the NDNAD. As forces conclude their investigations it is expected this figure will rise

Once the CED is fully established, profile records taken from serving police officers and special constables will be 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)<sup>61</sup>. In line with the Police and Criminal Evidence Act 1984 (PACE), DNA samples will be destroyed within 6 months of the sample being taken. In the future, the CED will be expanded to include the profile records of staff from other organisations who may potentially contaminate the crime scene or a sample taken from the crime scene.

### 1.5.3 Rapid DNA

Using standard DNA processing methods, it can take several days to generate a DNA profile from a DNA sample. However, Rapid DNA technology now exists which allows a sample to be processed in a matter of hours rather than days.

Processing is carried out by a small device that has the potential to be deployed at a crime scene. A number of rapid DNA devices have been produced by different companies, using these devices police forces continue to conduct pilots. The former rapid DNA Project Board has now closed.

There is approval in place for DNA profile records generated using Rapid DNA technology to be retained (appropriately caveated) on NDNAD and as of 31<sup>st</sup> March 2017, 315 such records were retained.

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<sup>61</sup> This change was brought in via [The Police \(Amendment\) Regulations 2015](#) and [The Special Constables \(Amendment\) Regulations 2015](#). The regulations were signed off on 1<sup>st</sup> April 2015.

## 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 continuous assessment.

FINDS (DNA) is responsible for ensuring that operational activity meets the standards for quality and integrity established by the NDNAD Strategy Board. 39 vetted staff have access to the NDNAD, this is made up of 27 with day to day operational access and 12 with system administrator access (as at 27/02/18)<sup>62</sup>. 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 science 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 Error rates

Police forces and FSPs have put in place a number of safeguards to prevent any errors from occurring with the processing and interpretation of DNA samples and FINDS (DNA) carry out daily integrity checks on the profile records loaded to NDNAD. Despite these safeguards, errors do sometimes occur with both samples taken from individuals and from crime scenes. The Police Elimination Database, which contains the profile records of police officers and staff, helps to reduce errors. FINDS (DNA) is currently leading 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. For example, if person A and person B are sampled at the same time, and the samples are put in the wrong kits, 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.

#### **ii. Forensic science provider sample 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.

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<sup>62</sup> The 12 system administrator accounts have not been included in previous annual reports.

### **iii. Forensic science provider interpretation error:**

This occurs where the forensic science provider has made an error during the processing of the sample.

### **iv. FINDS (DNA) transcription or amendment error:**

This occurs where FINDS (DNA) has introduced inaccurate information.

The table overleaf shows the error rate for subject and crime scene profile records for each organisation. No miscarriage of justice arose from these errors. However, had they remained undetected, they could have affected the integrity of the NDNAD.

**Table 5: Error rates**

Organisation	Error types	Sample Type	April to June 2016	July to September 2016	October to December 2016	January to March 2017
Profile records loaded		Subject	75,214	68,687	67,373	66,283
		Crime scene	10,043	10,152	10,347	10,272
Police Forces	Sample or record handling	Subject	35	27	23	19
		Subject (%)	0.047	0.039	0.034	0.029
		Crime scene	0	1	1	0
		Crime scene (%)	0	0.010	0.010	0
Forensic science providers	Sample or record handling	Subject	0	1	1	0
		Subject (%)	0	0.001	0.001	0.000
		Crime scene	1	1	2	1
		Crime scene (%)	0.010	0.010	0.019	0.010
	Interpretation	Subject	2	1	0	2
		Subject (%)	0.003	0.001	0	0.003
		Crime scene	9	9	18	11
		Crime scene (%)	0.090	0.089	0.174	0.107
FINDS (DNA)	Transcription or amendment	Subject	0	0	0	1
		Subject (%)	0	0	0	0.002
		Crime scene	1	0	0	2
		Crime scene (%)	0.010	0	0	0.019

### 1.6.3 FSP accreditation

Any FSP carrying out DNA profiling work for loading to NDNAD must be approved by FINDS (DNA) and the FIND (DNA) Strategy Board. This involves continuous monitoring of standards. As at 31<sup>st</sup> March 2017, **13** laboratories were authorised to load profile records to NDNAD.

### 1.6.4 Forensic Science Service (FSS) Archive

From April 2012, following the closure of the FSS, FINDS (DNA) became responsible for investigating any integrity issues raised concerning the results from profile records loaded to NDNAD by the FSS before they closed. In 2016/17, **277** investigations were raised on FSS data already loaded to NDNAD, demonstrating the value of the archive.

FINDS-DNA has also taken on responsibility for holding the archive of the original, raw DNA profiling results generated by the FSS. Case files from investigation work carried out by the FSS are managed by Forensic Archive Ltd. (FAL)

### 1.6.5 Forensic Science Regulator

In 2008, an independent Regulator<sup>63</sup> 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 Gill Tully.

The required standards are published in the Regulator's Codes of Practice and Conduct<sup>64</sup> and include accreditation of FSPs to international standards. Every company supplying the police with forensic services as part of the national procurement framework is required to meet the standards set out in the Codes.

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<sup>63</sup> For further information on the Regulator, see [www.gov.uk/government/organisations/forensic-science-regulator](http://www.gov.uk/government/organisations/forensic-science-regulator).

<sup>64</sup> These are available at [www.gov.uk/government/collections/forensic-science-providers-codes-of-practice-and-conduct](http://www.gov.uk/government/collections/forensic-science-providers-codes-of-practice-and-conduct).

## 1.7 Finance 2016/17

In 2016/17, the Home Office and policing spent **£1.22m**<sup>65</sup> running NDNAD on behalf of the criminal justice system.

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<sup>65</sup> This does not include IT costs.



## 2. National Fingerprint Database

### 2.1 Introduction

The National Fingerprint Database / National Automated Fingerprint Identification System (NAFIS), now 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 provide fingerprint matches to 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 given 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.<sup>66</sup>

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

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<sup>66</sup> 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 finger marks to make them visible. Finger marks developed and recovered from crime scenes are searched against the Tenprints obtained from arrested persons to identify who touched the surface the finger marks 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

### a) 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.<sup>67</sup>

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.<sup>68</sup>

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*.<sup>69</sup>

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<sup>67</sup> Cited from Forensic Science Regulator Codes – Fingerprint Comparison 24.5.1

<sup>68</sup> Cited from Forensic Science Regulator Codes – Fingerprint Comparison 24.5.4

<sup>69</sup> Cited from Forensic Science Regulator Codes – Fingerprint Comparison 24.5 – 24.11.1

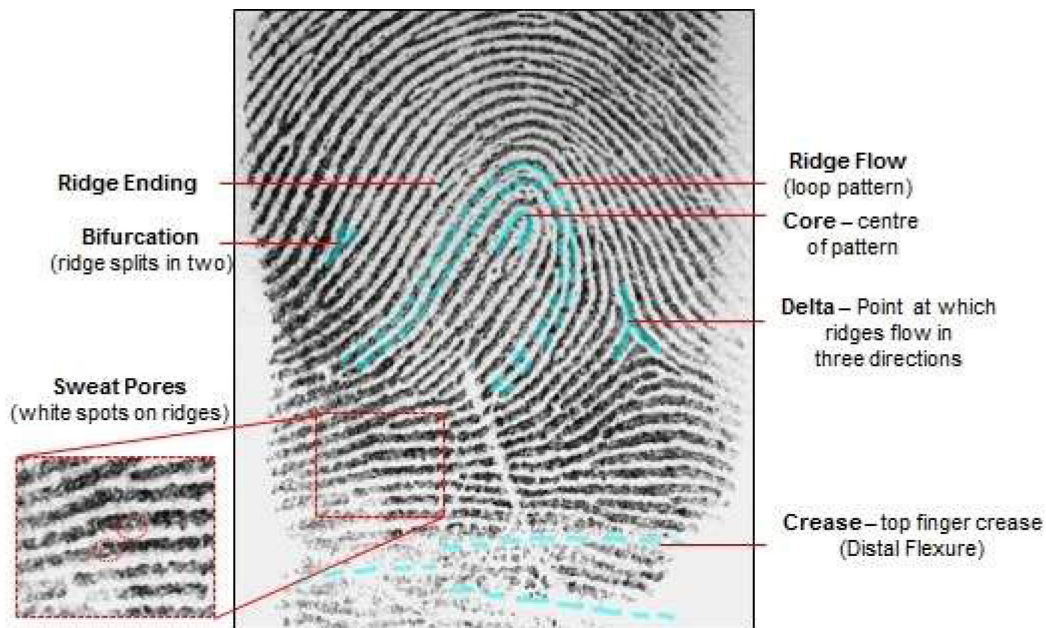


Image courtesy of Lisa J Hall, Metropolitan Police Forensic Science Services; permission to reproduce granted.

**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.

#### b) 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.

#### c) 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.

#### d) 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 practitioners 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 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 upon it.

Home Office Forensic Information Database Services - National Fingerprint Office: The Home Office is responsible for assuring the quality and integrity of data held on the National Fingerprint Database 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 Office are developing a data assurance strategy to monitor the activities of the agencies that provide the inputs to the fingerprint database and its supply chain. The strategy will ensure compliance of those agencies to the FSR codes and conformance to ISO 17025, as well as identifying and correcting data errors and unexpected results. With the application of trend analysis techniques, the NFO will monitor the performance of the

agencies that contribute to and use the national fingerprint database from March 2018. Through interaction with the user community, the NFO will coordinate improvements to business and system processes to improve data quality further.

The statement of requirements of FINDS is currently being expanded and consulted upon to agree the oversight that FINDS (through enacting the expanded rules of the FIND Strategy Board to include the fingerprint database) has over the fingerprint holdings owned by police forces. Once this has been agreed it will be articulated to the Board and described in subsequent annual reports.

#### 2.1.4 Access to National Fingerprint database

The number of IDENT1 active users is 951. 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 5,563 as at 28/11/2017.

## 2.2 Who is on IDENT1?

### 2.2.1 Number of profile records held on IDENT1 System<sup>70</sup>

As at 31<sup>st</sup> March 2017, IDENT1 held **7,905,419** subjects that are associated with one or more fingerprint forms.

As at 31<sup>st</sup> March 2017, IDENT1 held **24,059,907** unique Fingerprint Forms associated with all subjects held on the system.

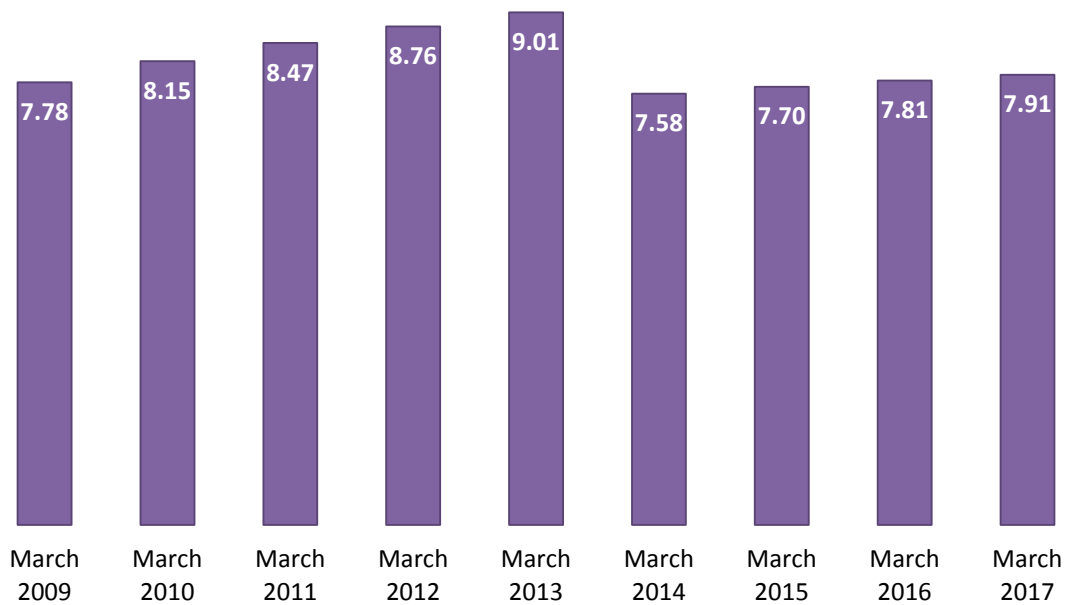
As at 31<sup>st</sup> March 2017, IDENT1 held **2,285,669** unidentified crime scene marks

**Table 6. 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
<b>March 2009</b>	7,777,645	16,800,474	1,785,568
<b>March 2010</b>	8,148,624	18,397,648	1,864,853
<b>March 2011</b>	8,471,960	19,906,978	1,896,885
<b>March 2012</b>	8,759,820	21,303,201	1,971,938
<b>March 2013</b>	9,006,957	22,508,260	2,029,028
<b>March 2014</b>	7,578,717	21,702,050	2,110,962
<b>March 2015</b>	7,695,129	22,571,529	2,303,565
<b>March 2016</b>	7,814,041	23,364,390	2,318,576
<b>March 2017</b>	7,905,419	24,059,907	2,285,669

<sup>70</sup> Source: FINDS - National Fingerprint Office in consultation with the IDENT1 supplier

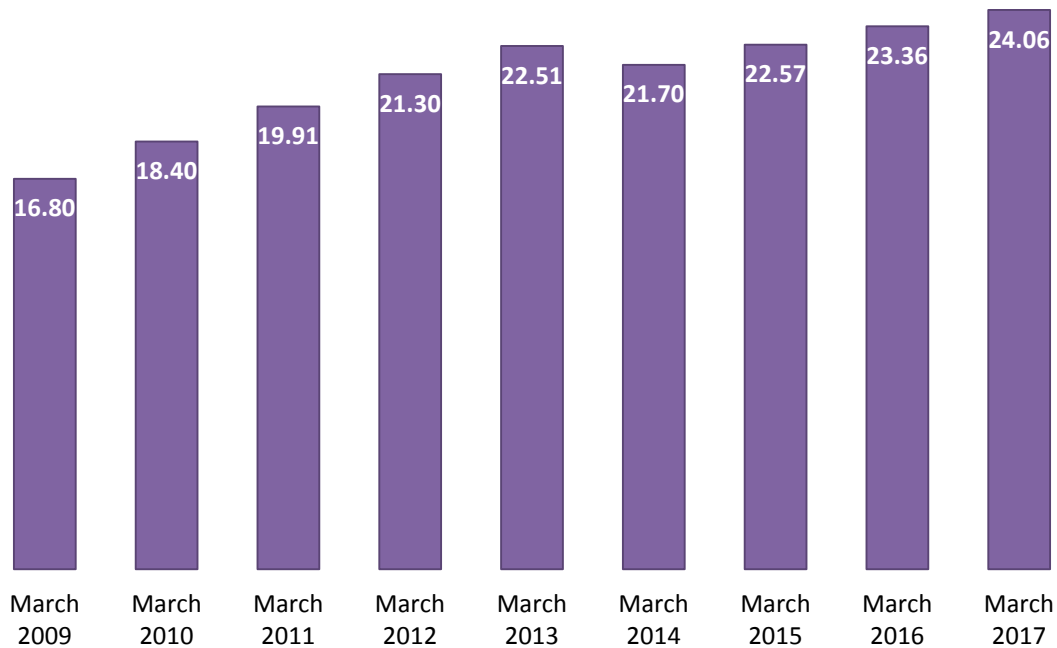
**Figure 5: Number of individuals on IDENT 1 (in millions) (March 2009 to March 2017)<sup>71 72</sup>**



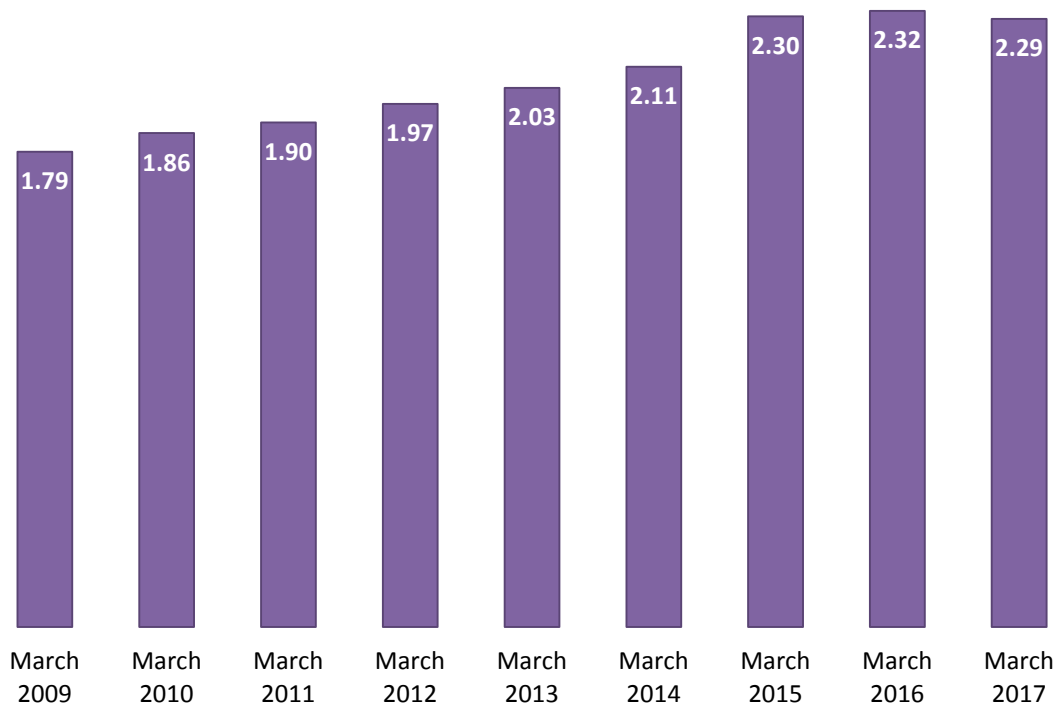
<sup>71</sup> Source: FIND - National Fingerprint Office in consultation with the IDENT1 supplier

<sup>72</sup> 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.

**Figure 6: Number of Fingerprint Forms Held for all Subjects on IDENT1 (in millions) (March 2009 to March 2017)<sup>73</sup>**



**Figure 7: Number of unique unidentified mark submissions held on IDENT 1 (in millions) (March 2009 to March 2017)<sup>74</sup>**



<sup>73</sup> Source: FINDS - National Fingerprint Office in consultation with the IDENT1 supplier

<sup>74</sup> Source: FINDS - National Fingerprint Office in consultation with the IDENT1 supplier



## 2.3 Vulnerable persons.

The National Fingerprint Database contains fingerprints obtained with consent from vulnerable persons, specifically those defined at risk of Honour Based Violence, Forced Marriage or Female Genital Mutilation. The taking of fingerprints and DNA samples is a key protective measure advised by the ACPO 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.<sup>75</sup> Fingerprints donated by vulnerable persons are available for search on the national fingerprint database and as such provide means to identify a vulnerable person when they come to police notice. There were 5,126<sup>76</sup> sets of fingerprints relating to vulnerable people held on the database as at 31<sup>st</sup> March 2017

## 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 305 print sets relating to missing persons held on the database as at 31<sup>st</sup> March 2017.

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<sup>75</sup> 1.5 – ACPO Guidance on Taking of Fingerprints, DNA & Photographs of Victims / Potential Victims of Forced Marriage – Handling Procedures

<sup>76</sup> FABrIC Service Performance Monitoring Report (April 2017 Service Period)

# 3. Legislation governing DNA and Fingerprint retention

## 3.1 Overview

PoFA and the Anti-Social Behaviour, Crime and Policing Act 2014 (ASBCPA) amended PACE to establish the current retention framework for DNA and fingerprints.

## 3.2 Protection of Freedoms Act 2012

### 3.2.1 Introduction

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

### 3.2.2 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.

### 3.2.3 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)<sup>77</sup>. This allows sufficient time for the sample to be analysed and a DNA profile to be produced and uploaded to NDNAD.

### 3.2.4 Biometrics Commissioner

PoFA also established the position of Commissioner for the Retention and Use of Biometric Material ('the 'Biometrics Commissioner')<sup>78</sup>. 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

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<sup>77</sup> 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.

<sup>78</sup> For more information on the work of the Biometrics Commissioner see

<https://www.gov.uk/government/organisations/biometrics-commissioner>.

has a general responsibility to keep the retention and use of DNA and fingerprints, and retention on national security grounds, under review.

### 3.2.5 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.

### 3.2.6 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 unless there is a match in which case 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	<p><b>1st conviction:</b> five years (plus length of any prison sentence), or indefinite if the prison sentence is for five years or more.</p> <p><b>2nd conviction:</b> indefinite</p>

**Table 6b: Retention periods for unconvicted individuals**

Situation	Fingerprint & DNA Retention Period
Any age charged with but not convicted of a qualifying <sup>79</sup> 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 <sup>80</sup> 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 <sup>81</sup> for a recordable offence which is not excluded <sup>82</sup> )
Any age arrested for or charged with a minor <sup>83</sup> 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

<sup>79</sup> 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).

<sup>80</sup> 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.

<sup>81</sup> Convictions include cautions, reprimands and final warnings.

<sup>82</sup> 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.

<sup>83</sup> A minor offence is a 'recordable' offence which is not also a 'qualifying' offence.

### 3.3 Early Deletion

PoFA requires the FIND Strategy Board to issue guidance about the destruction of DNA profile records<sup>84</sup>. This guidance, known as the 'Deletion of Records from National Police Systems', covers DNA profile records and samples, fingerprints and PNC records and was published in May 2015. It replaces both the 'Early Deletion Guidance and Exceptional Case Procedure'. 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's established that they died of natural causes);
- the investigation was based on a malicious or false allegation;
- the 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.<sup>85</sup>

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<sup>84</sup> As set out under section 63AB(4) of the Police and Criminal Evidence act 1984 (PACE) as inserted by section 24 of PoFA.

<sup>85</sup> 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 the appropriate standards. Following the assessment, a statement will be published which states whether or not the standards have been met.

All Forensic Science Providers and laboratories which process DNA samples are required to be accredited to ISO17025; 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 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 Group:** 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 Sexual Assault Referral Centre (SARC) staff who come into regular contact with crime scenes, 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 force staff employed to look for 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 physical 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 16 pairs of numbers 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

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 carried out where DNA is found at a crime scene but there is no subject profile on NDNAD to look for relatives 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.

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 of the FIND Strategy Board.

**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 Regulator:** 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 science 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



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.

**NDU transcription or amendment error:** This occurs where NDU 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 less certainty 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 31<sup>st</sup> 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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