

## Tactical Advice Using Familial DNA Intelligence Products in Serious Crime Investigations

Police Standards Unit  
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Since it was established in 1995 the National DNA Database (NDNAD) has been an invaluable tool in detecting crime and instrumental in providing suspect matches in many serious crimes including murder, sexual offences and other violent crimes.

The NDNAD is the largest database of its kind, currently holding profiles for 5.24% of the U.K population. This puts the U.K at the forefront in the use of DNA profiling techniques for crime investigation. The large size of the NDNAD not only increases the chance of identification of an unknown offender but also provides for its application as an intelligence tool. One of the most recent of these intelligence applications is familial searching; a search of the NDNAD in order to identify possible close relatives of an offender that has left a DNA profile

at a crime scene but is not themselves held on the NDNAD.

Although proving successful in the investigation of serious crime the use of the familial DNA must not be entered into lightly. Senior Investigating Officers will need to consider this document alongside ACPO guidelines and the broader ethical 'dimension' in which familial DNA sits. These obligations and appropriate safeguards are contained within this document.

Managing and effectively utilising the product can be resource intensive and it is important that investigators are well briefed on familial DNA intelligence before commencing the process. This guide is intended to be the first port of call at the commencement of a familial investigation and it is hoped that this document will prove useful in managing the prioritisation of intelligence leads produced by familial searching.

This advice document has been jointly researched and compiled with the National Centre for Policing Excellence and is the distillation of independent good practice and experience drawn from the work of highly experienced operational investigators and forensic scientists who have actual first hand experience of applying familial DNA techniques to both current and historic serious crime investigations. This document represents the current knowledge of 'what works' today in this rapidly evolving area.

It may be helpful to know that when embarking on the familial DNA process, support and guidance is always available from the NCPE, forensic suppliers, the Home Office and the DNA Operations Group.

I am very pleased to present this practical guide for the use of familial DNA intelligence in serious crime investigations. I hope it will be of real use to all of you who are working to bring offenders to justice and ultimately provide closure and reassurance to victims and their families.

I commend it to you.

A handwritten signature in red ink that reads "Andy Burnham".

ANDY BURNHAM M.P



## Acknowledgements

PSU and NCPE are grateful to the authors of this document;

[REDACTED]

There are many more who have kindly helped with this document please accept our sincere apologies if we have failed to mention you but your input has been invaluable.

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## Section 1

### INTRODUCTION

This section covers a brief description of familial searching and the reasoning behind the production of this advice.

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- 1.1 What is familial searching?
- 1.2 Why is there a need for this advice?

## 1.1 What is familial searching

Familial searching is a search of the National DNA Database, (NDNAD) to identify potential close relatives of an offender when the offender's DNA profile is not present on the NDNAD.

The familial searching approach is based on three principles:

1. DNA is inherited and all members of a family will share certain amounts of DNA. Children will share half their DNA with their father and half with their mother. The extent to which siblings will share their DNA is variable but they will tend to share a larger proportion of DNA bands than unrelated people.
2. It is possible that one or more members of a family may have their profile on the NDNAD. However, it has to be recognised that there may be offenders in families, where no other family member is on the database or that other family members may be criminally active but have not yet entered the judicial process, for whatever reasons.
3. Many families reside within a small geographic area and studies also support the concept that offenders tend to commit crime close to where they reside.

## 1.2 Why is there a need for this advice

Familial searching of the NDNAD is an investigative option known to many investigators due to some recent high profile successes, some of which feature as case studies at Appendix A.

However, while the title, outline of the science and theory of how it works may be known to many, the practicalities of investigating an offence utilising familial DNA are not widely known. Indeed, the identification of good practice is still developing in what is still a relatively new investigative tool/tactic.

A significant number of Senior Investigating Officers (SIOs) have requested that a project be established to draw together the experience of those who have moved into the investigative phase of utilising a familial DNA search product.

The National Centre for Policing Excellence Crime Operations (NCPE Crime Ops, formerly NCOF), the Home Office Police Standards Unit (PSU) and the Forensic Science Service (FSS) commissioned the assistance of Senior Investigating Officers (SIOs) with experience of familial DNA investigations.

This advice is the product of that research project and is current as at May 2006. It provides tactical options and will be updated as further good practice becomes available by the NCPE (Crime Operations).

This document is complementary to the Background to Familial Searching - FSS June 2004 and ACPO DNA Good Practice Guide 2005, and replaces the Crime Investigation Support Officers Tactical Guidance on the use of Familial DNA and the Familial Searching Policy and Guidance for SIOs. All the information regarding the commissioning and the use of familial DNA intelligence is now contained in this advice document.



## Ethical Issues

The views of the Home Office Legal advisers and the Office of the Information Commissioner have been sought, in order to clarify the legality and ethics of using the NDNAD for familial searches. Familial searching is compliant with the uses of the NDNAD specified by PACE. The Information Commissioner agreed that under the Data Protection Act it would be proportionate only if restricted to the most serious of cases and recommended that all reasonable steps should be taken to minimise intrusion into the private lives of individuals.

However, although familial searching has been approved by the NDNAD Board based upon the advice provided by the Information Commissioner, there remains significant public concern in the use of this approach. Indeed, the NDNAD Board will be referring the use of this technique to its new Ethics Committee for its consideration. It is therefore important that nothing is done in the interim to prejudice the use of this technique.

It is therefore important that the SIO understands the ethical issues surrounding the use of familial DNA at the outset.

The method to be adopted by the SIO when approaching a potential relative identified by this process is critical. In each case the following needs consideration: -

- It is possible that the father of an offender will not know of the existence of an offspring – the ‘unknown child’ issue.
- It is conceivable that a family might have assumed a child to be fathered by one individual, whereas the DNA results imply someone else to be the father – the ‘mis-believed paternity’ issue.
- The fact that an individual is on the NDNAD may cause the perception that the individual has been convicted of a criminal offence. Although this is not necessarily true, the mere suggestion that a relative has been involved in criminal activity, whether or not that individual is later eliminated from the enquiry, may be sufficient to cause a breakdown of family relations. Relationships within a community could similarly be affected.

It is because of the above considerations that the FSS/NCPE/ACPO ‘Familial Searching Policy and Guidance for Senior Investigating Officers has specified that approval for the use of familial searching must be given by an ACPO officer.



## Section 2

### STARTING OFF

This section covers when to use familial searching and what to do start the process.

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- 2.1 When do I consider a familial search?
- 2.2 What do I do to establish a familial search?
  - 2.2.1 An authorisation strategy
  - 2.2.2 Forensic budget holder
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  - 2.2.4 National Centre for Policing Excellence(NCPE) – Crime Operations
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  - 2.2.7 Family liaison
  - 2.2.8 Disclosure
  - 2.2.9 Management of data
  - 2.2.10 Media/communications
  - 2.2.11 Policy book entries

## 2.1 When do I consider a familial search

Familial searching can be applied only in cases of serious crime where a full SGM Plus DNA profile exists from a crime scene stain which does not yet match against a subject profile on the NDNAD and there is an acceptable level of certainty that the crime scene profile is relevant to the offender (i.e. not the result of contamination). In these cases, subject to ACPO authority, an SIO can commission a search of the NDNAD to identify persons who may be related to the offender.

It is advisable at this stage, prior to initiating the familial search, to consider a comparison of the crime scene profile to other international DNA databases. To do this SIOs should refer to guidance contained within the documents 'Procedures for UK International Searches' (publication from DNA Database Board and DNA Good Practice Guide and the 'Interpol Handbook on DNA Data Exchange and Practice').

It is debatable whether familial searching should be a 'last resort' option when other lines of enquiry are exhausted or an early consideration providing the opportunity for a 'quick hit' (see later) and the consequent early detection and cost savings.

## 2.2 What do I do to establish a familial search

The SIO should request an initial briefing by scientists from the relevant forensic science provider (FSP) to explain the scientific theory behind familial searching and the implications for the SIO when undertaking the procedure.

### 2.2.1 An authorisation strategy

Written consent to undertake a familial search must be obtained from an ACPO Officer (Appendix B). This high level of authority is considered necessary in order to ensure that the approach is only used where necessary, justifiable and proportionate, taking into account the impact of the sensitive ethical issues familial searching can generate. ACPO endorsement of the approach will also provide support and confidence to the SIO when undertaking such a line of enquiry.

### 2.2.2 Forensic budget holder

Authorisation must be obtained from the Force Scientific Support Manager (SSM) or equivalent officer (Appendix B). This is because an investigation utilising the familial searching technique can have significant impacts on forensic budgets.

### 2.2.3 SIO appointment

Familial searching should not be undertaken without the appointment of an SIO to oversee and manage the case. This is to ensure adequate management of the process and reduce the risk of compromise.

### 2.2.4 National Centre for Policing Excellence – Crime Operations

The NCPE (Crime Ops) have supported numerous investigations which have utilised familial searching and it is strongly recommended that in all investigations where the use of familial DNA intelligence is being considered, advice should be sought at the outset from your Regional Advisor or Crime Investigation Support Officer from the NCPE.

### 2.2.5 Crown Prosecution Service (CPS)

It may be advantageous, at an early stage, to consult and brief the relevant CPS representative.

### 2.2.6 Community impact assessment (CIA)

Consideration should be given to the completion of a CIA in consultation with the relevant territorial commander.

### 2.2.7 Family liaison

A family liaison strategy should be completed in accordance with national guidelines. This is particularly relevant where the family subject of the enquiry is not made aware of the process employed in the investigation.

### 2.2.8 Disclosure

A disclosure officer has an important role in this process and must give early consideration to all disclosure issues. Familial searching is a relatively new procedure and many disclosure issues have yet to be tested. The list of names provided is for intelligence purposes only and should not be produced in evidence. The familial search results lists should be treated as sensitive material and be protected as a police tactic.

### 2.2.9 Management of data

The quantity of names appearing on most familial lists, potentially several thousand, in many cases prohibits creating each person as a nominal on a HOLMES database. However, having the results lists typed into the HOLMES system as a document allows simple searching against names already in the database.

The revised MIRSAP (2005) gives guidance that DNA screens should be managed using HOLMES.

A clear view of progress will be required and this issue should be specifically addressed in a current situation report if the case is closed as undetected. The situation report should include details of policy decisions concerning those to be sampled based on cost and resource availability.

Developments in technology or changes to available resources may prompt a review to that policy which may be conducted by another SIO several months or even years after.

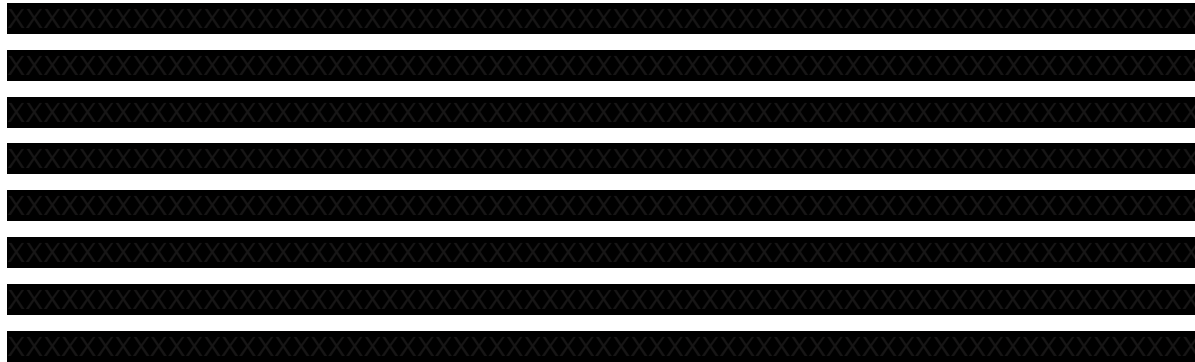


SIOs need to be mindful of the essential need to maintain public confidence in the oversight and management of the NDNAD and Police use of data from it. The Criminal Procedure and Investigation Act and its associated conventions place detailed legal requirement on the police service to retain, record and reveal all material which comes into a criminal investigation. Familial data is not excluded from that requirement however SIOs must ensure that the familial data is kept secure and accessed only by those with the appropriate authority for the purpose of investigating serious crime.

## 2.2.10 Media/communications

The SIO should have a media strategy relating to the use of familial searching of the NDNAD. It is recognised that the process is already in the public arena but the SIO should not disclose which relationship led to the identification of the offender. The media strategy should be a joint strategy agreed via the force media officer with ACPO, the FSP and CPS involved.

## 2.2.11 Policy book entries



It is important that the approach and format of the questions asked of those on the list is consistent.

A policy decision on the approach to the individual and what they are to be told will require formulation. Suggested wordings are shown at Appendix C.

## Section 3

### INVESTIGATION

This section covers how to use familial search results in the course of an investigation.

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- 3.1 Conducting an investigation using familial DNA
- 3.2 Quick hits
- 3.3 Prioritisation of the familial DNA search product
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- 3.5 What approaches can I take to eliminate nominals
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- 3.6 Research of family history 3.7 How do I approach individuals?
- 3.8 The swabbing of individuals
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- 3.9 Untraceable/deceased nominals and hospital samples
- 3.10 Review and refreshing of familial DNA intelligence
- 3.11 Data retention and disclosure

### 3.1 Conducting an investigation using familial DNA

The FSP will undertake two searches of the entire NDNAD. The first search is to identify potential children or parents of the offender, and the second, to identify potential siblings of the offender. Lists will be generated of names of persons on the NDNAD who satisfy the genetic criteria for these two special relationships. In agreement with the SIO, these lists will then be prioritised in line with parameters specific to each case, which may include age, geographical location and gender.

At the very outset it is important that SIOs consider utilising the services of an NCPE behavioural advisor and NCPE geographical profiler to advise and assist on setting the search parameters.

The familial DNA element of the investigation should, where appropriate, be conducted alongside other conventional lines of enquiry and should not for example cause the swabbing and elimination/implication of nominals of interest to cease. Familial Intelligence needs to be researched as part of an overarching investigation which also utilises other sources such as the nominal suspect pool generated at the time of the offence and current intelligence sources including VISOR and PNC.

It is essential that SIOs, right from the outset, keep in mind the obvious fact that familial DNA can only identify the suspect in cases where the suspect already has a relative on the NDNAD.

[REDACTED]

When conducting an investigation which seeks to utilise familial searching of the NDNAD it is important that the staff engaged within the investigation understand the process and the science and are substantive detectives. To achieve this it is essential that the SIO undertakes a full briefing of all staff to cover the points identified above. It is recommended that SIOs invite a scientist to this briefing to deliver a brief input on the science underpinning this investigative tool. This will ensure that the staff, particularly the swabbing teams, are consistent in their approach to individuals, thereby minimising the chance of unnecessary intrusion or compromise.

### 3.2 Quick hits

[REDACTED]



### 3.3 Prioritisation of the familial DNA search product

[REDACTED]

### 3.4 Methods of prioritisation

[REDACTED]

#### 3.4.1 Method 1 - Using a geographical filter on the NDNAD, Appendix E, box 5

[REDACTED]

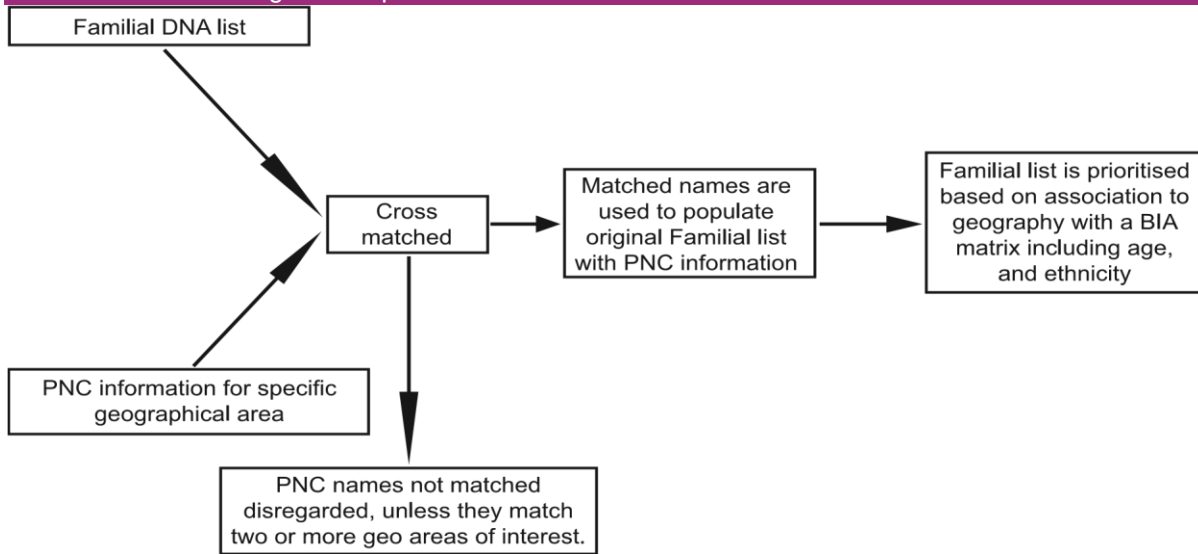
#### 3.4.2 Method 2 - Using a geographical filter on the PNC, Appendix E, box 6

[REDACTED]

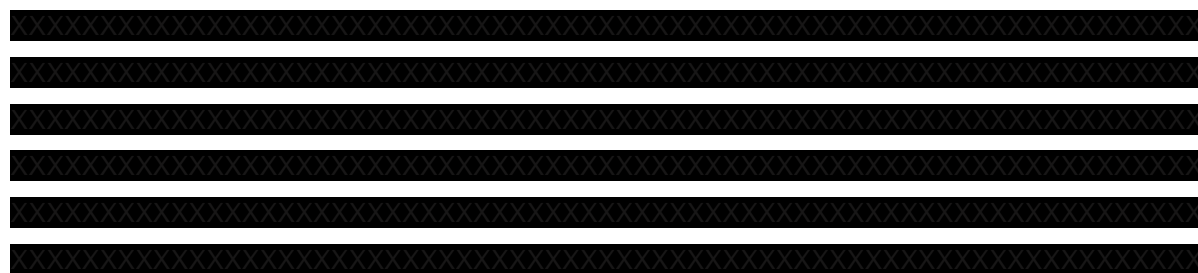
In addition to this process, where there are two or more offences committed by the same offender at different locations, it is possible to cross match the lists taken from PNC to assess whether anyone has an association to both areas of interest. Such individuals, who do not feature on the familial DNA search results lists, become nominals of interest and could be the offender. (See italic script in chart below and Appendix E box 7)



There is nothing preventing an SIO from utilising Method 1 above before reverting to Method 2 at a later date if the investigation requires it.



### 3.5 What approaches can I take to eliminate nominals



#### 3.5.1 Y-STRs

The male individual is characterized by the presence of a Y-chromosome and an X chromosome, whereas the female is characterised by the absence of a Y chromosome and presence of two X chromosomes. The Y-STR is inherited unaltered from father to son. Thus, if a male appears on the familial lists as a possible parent, child or sibling of the offender, in order for that to be true, his Y-STR must match that of the crime scene stain. If it does not, all his male siblings, together with his biological father and all his sons are eliminated as possible offenders.



See Appendix F for a diagrammatic explanation of how Y-STR is inherited.

### 3.5.2 Mitochondrial DNA

Mitochondrial DNA is inherited through the maternal line. Both males and females inherit their Mitochondrial DNA profile from their mother. For a male that is the end of the inheritance line, females pass the Mitochondrial DNA profile onto their children. Thus, if a female appears on the familial search results lists as a possible parent or sibling of the offender, in order for that to be true, her Mitochondrial DNA profile must match that of the crime scene stain. If it does not match, all her siblings and her children are eliminated as possible offenders. NB. Her father is NOT eliminated in this situation.

Mitochondrial DNA, if available, can also be used in relation to males that appear on the results lists. All the siblings of the male on the familial list will have inherited their Mitochondrial DNA from the same person, their mother. Thus, if the Mitochondrial DNA of the person on the results list does not match the crime scene stain, all his siblings, both male and female are eliminated as possible offenders.

A diagrammatic illustration of how Mitochondrial DNA is inherited is shown at Appendix G.

### 3.5.3 Obtaining Y-STR/mitochondrial profiles from a crime stain

It is not always possible to obtain a Y-STR or Mitochondrial DNA profile from the crime stain. Success depends largely on the amount and quality of the crime stain that is remaining. Your forensic service provider should be able to evaluate the likelihood of success prior to processing.

### 3.5.4 Obtaining Y-STR/mitochondrial profiles from a nominals on the familial list

Familial searching provides lists of nominals that are on the National DNA Database. When DNA samples are taken, 2 buccal scrapes are obtained, one of these is used to obtain an SGM plus profile and the current policy is to store the other for possible later use. It is this second sample, referred to as the 'B Scrape' which is usually used to obtain the Y-STR and/or Mitochondrial DNA profile of the individual (subject to prior authority being obtained from the NDNAD Board).

Both the authorisation level and the authorisation form for obtaining access to the second buccal scrape for both Y STR and Mitochondrial DNA analysis are currently under review by Mr Stuart Hyde, Assistant Chief Constable West Midlands Police and chair of the DNA Operations Group. The new authorisation form is shown at Appendix H.

## 3.6 Research of family history

Research of family trees of individuals appearing on the results lists can be a slow, resource intensive process but is required in circumstances where either there is no possibility of obtaining a Y-STR or Mitochondrial DNA profile, or the individual on the list is female and cannot be progressed via the Y-STR (male chromosome) method, or the Y-STR profile of the individual on the list matches the crime scene stain.





[Redacted]

Although these tactics help to avoid unnecessary intrusion into the private life of persons on the familial lists, it is still the case that sometimes unknown facts regarding family trees or family history can ultimately be resolved only by speaking to the individual on the familial list. For further suggestions on potential sources of information on compiling family trees, contact NCPE Operations Centre.

### 3.7 How do I approach individuals

#### Nominals on the Familial Lists

[Redacted]

### 3.8 The swabbing of individuals

#### 3.8.1 Taking swabs from relatives of nominals on the familial list

Comprehensive and exhaustive guidance on this subject is contained within 'Intelligence Led DNA Mass Screens: A Manual of Guidance, NCPE, 2005 (available on NCPE Genesis website at [www.genesis.pnn.police.uk/genesis](http://www.genesis.pnn.police.uk/genesis)). It is strongly recommended that SIOs familiarise themselves with this guidance and apply it.

[REDACTED]

Both the SIO and the team may ultimately be challenged by individuals and families as to why they have been identified. Consideration should also be given to the possibility that the Court may challenge the SIO on his/her operational knowledge of the technique, which led to decisions relating to the disclosure of information to subjects.

Previously, disclosure that a person had a profile on the NDNAD was tantamount to a disclosure that they had a previous conviction. There are an increasing number of voluntary samples being loaded to the NDNAD as well as samples on arrest. It is important to recognise that these individuals may not have any previous convictions themselves. Furthermore increasing numbers of samples are being taken and retained under Sections 9 and 10 of the Criminal Justice Act 2003 loaded from persons arrested for recordable offences who are never charged/proceeded against.

[REDACTED]

#### 3.8.2 Swabbing teams

[REDACTED]

### 3.8.3 Refusals

[REDACTED]

### 3.9 Untraceable/deceased persons

From time to time it may be necessary to eliminate people from whom samples cannot be obtained directly. In these circumstances the SIO can apply to a Crown Court judge for an order allowing area health authorities to release any medical samples they may have from the individual which form part of their medical record e.g. the 'Guthrie' blood spot cards used at birth or any other histology samples.

This is a contentious issue and there is uncertainty and debate about the legal and ethical justification for this in certain quarters. However, so far, Judges have almost always supported Police requests for such samples by granting the Police a Court Order to obtain such samples from the health authority.

A proportionality test for such work would need to address whether this is justified and whether other methods have been tried and failed. This should be entered into the SIO's policy book. As this approach is contentious, any request must be fully justified and be made in only the most serious of offences. The profile identified must only be compared to the individual profile and must not be loaded to the NDNAD in any circumstances.

### 3.10 Review and refreshing of familial DNA intelligence

Where no suspect is identified during the first piece of work using the methods described in this document, SIOs should consider asking the FSP to re-run the familial DNA Intelligence search. This is recommended because some 40,000 new subject sample profiles per month are being added to the NDNAD. The number of subject sample profiles on the database is expected to grow from around 3 million presently to over 4 million during the next three years. There is no additional cost for this service over and above the initial familial search charge and the exercise can be repeated as often as the SIO considers necessary.


### 3.11 Date retention and disclosure

The Criminal Procedure and Investigation Act and its associated conventions place detailed legal requirements on the Police Service to retain, record and reveal all material which comes into a criminal investigation. Familial data is not excluded from that requirement. However, SIOs must ensure that the familial data is kept secure and accessed only by those with the appropriate authority for the purpose of investigating serious crime.

The list of names provided is for intelligence purposes only and should not be produced in evidence. The familial search results lists should be treated as sensitive material and be protected as a police tactic.

## Appendices

### CONTENTS

- A Familial case studies from English and Welsh forces
- B Agreement of understanding
- C Suggested wordings for approaching individuals to obtain elimination samples
- D Summary of selected research on distance/geographic relationships for stranger rape offences
- E Process chart
- F Y-STR family tree (inheritance)
- G Mitochondrial inheritance
- H Authorisation for obtaining access to the second buccal swab (B scrap) for Y-STR/mitochondrial elimination of nominals
- I Target profile
- J 



Appendix A

[Redacted text block]

Appendix B

[Redacted text block]

Appendix C

[Redacted text block]

[Redacted text block]

Appendix D

Source	Distance from offender's residence to encounter site with victim	Percentage of sample	Notes
Locating the Stranger Rapist - Police Research Group Special Interest Series Paper 3 1995 Davies and Dale	Within 1 mile	33%	Research based on sample of 70 stranger rapists and 300 offences committed by them. 85% of sample had a criminal record.

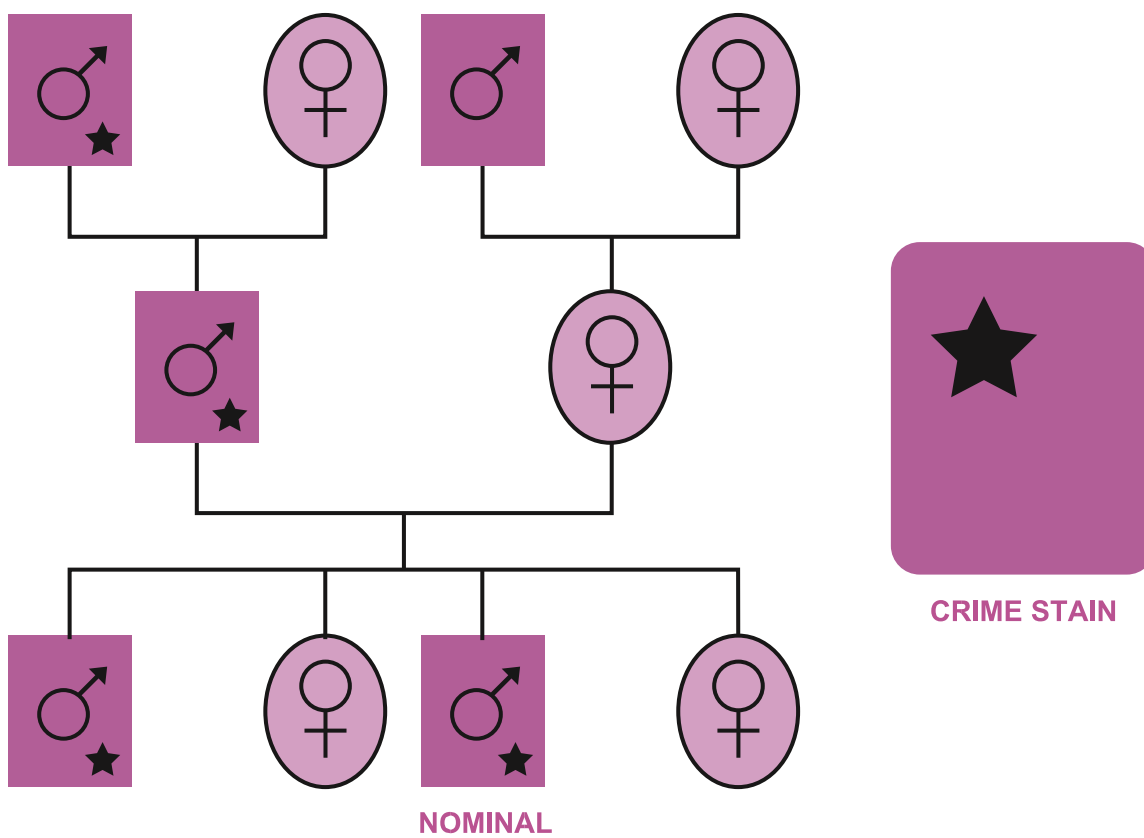


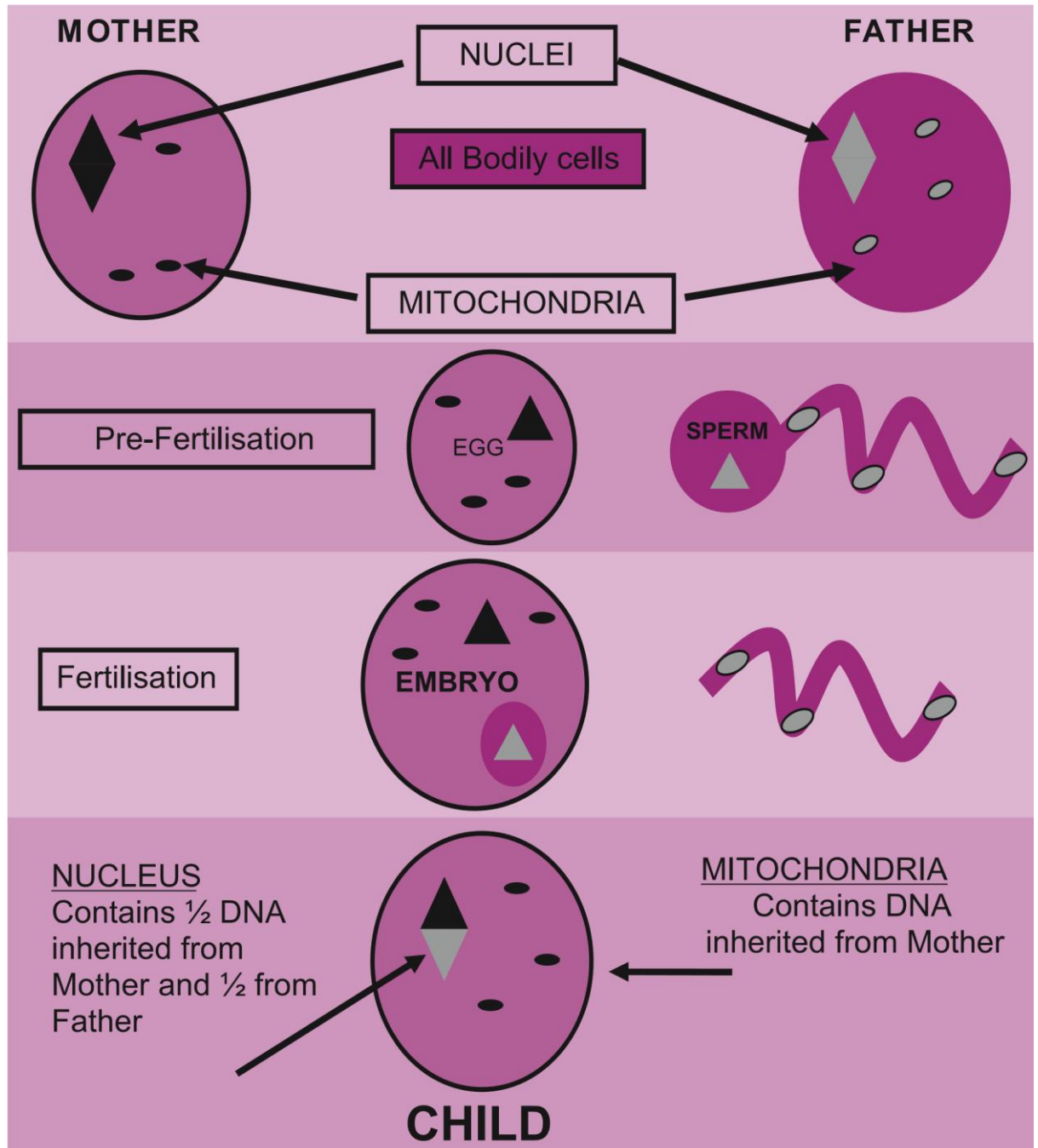
	Within 2 miles	50%	
	Within 5 miles	75%	
	Within 10 miles	87%	
Exploring the Geo-demographic and distance relationships between stranger rapists and their offences Home Office Special Interest Series No 16 2004 Rossmo Patrick and Davies	Median (typical distance) 2.4km (1.5 miles)	50%	Based on sample of 373 detected stranger rapes. 76% of offenders had a previous conviction.
	Within 8.2km (5 miles)	75%	
Offenders without previous convictions	Median (typical distance) 1.6km)		
Vehicle used	Median (typical distance) 4.1km)		

Appendix E - Process chart



Appendix F - Y-STR family tree









Appendix J -



## Further reading

- Background to Familial Searching FSS June 2004.
- Familial Searching Policy and Guidance for Senior Investigating Officers FSS/NCPE/ACPO.
- ACPO DNA Good Practice Guide 2005.
- Good Practice Guide Cold Case Reviews of Rape and Serious Sexual Assault. PSU 2005.
- MIRSAP 2005.
- Procedures for UK International Searches. ACPO DNA Database Board.
- Interpol Handbook on DNA Data Exchange and Practice. Interpol website.
- The Police National DNA Database: Balancing Crime Detection, Human Rights and Privacy Jan 2005. Genewatch UK pressure group.
- Intelligence Led Screens: A manual of guidance, NCOF, 2004. (A Practitioner's Guide to Intelligence Led Mass DNA Screening).
- Exploring the geo-demographic and distance relationships between stranger rapists and their offences – Rossmo et al - Home Office Special Interest Series Paper 16 - 2004.
- Locating the Stranger Rapist – Davies et al - Home Office Special Interest Series Paper 3 - 1995.
- Predicting the Criminal Record of a Stranger Rapist – Davies et al – Home Office Special Interest Series Paper 12 – 1998.
- Duplicated – see above.

- Predicting the Accuracy of Stranger Rape Victims' Statements Thomas Aitken Lucy and Feist Home Office Special Interest Series 2004.
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