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**ESRC Research ‘Seminar series on genetics, technology, security and justice. Crossing, contesting and comparing boundaries’**

***‘Forensic genetics in society an operational perspective’***

Gary Pugh  
Director Forensic Services  
Metropolitan Police Service

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## **Forensic Genetics;**

A significant physical interaction between the suspect and the crime scene or victim provides the greatest opportunity for forensic science to solve the crime, eliminate the innocent and bring offenders to justice by;

- confirming whether or not a crime has been committed
- identifying and eliminating suspects
- establishing the sequences of events
- validating the account of victims, suspect and witnesses
- providing links between crimes to identify serial offending

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Operationally Forensic Genetics currently means DNA Profiling that is;

Sizing not sequencing

Non-coding not Coding

Readable not Knowable

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### **Uses of the National DNA Database (NDNAD) in the investigation of crime**

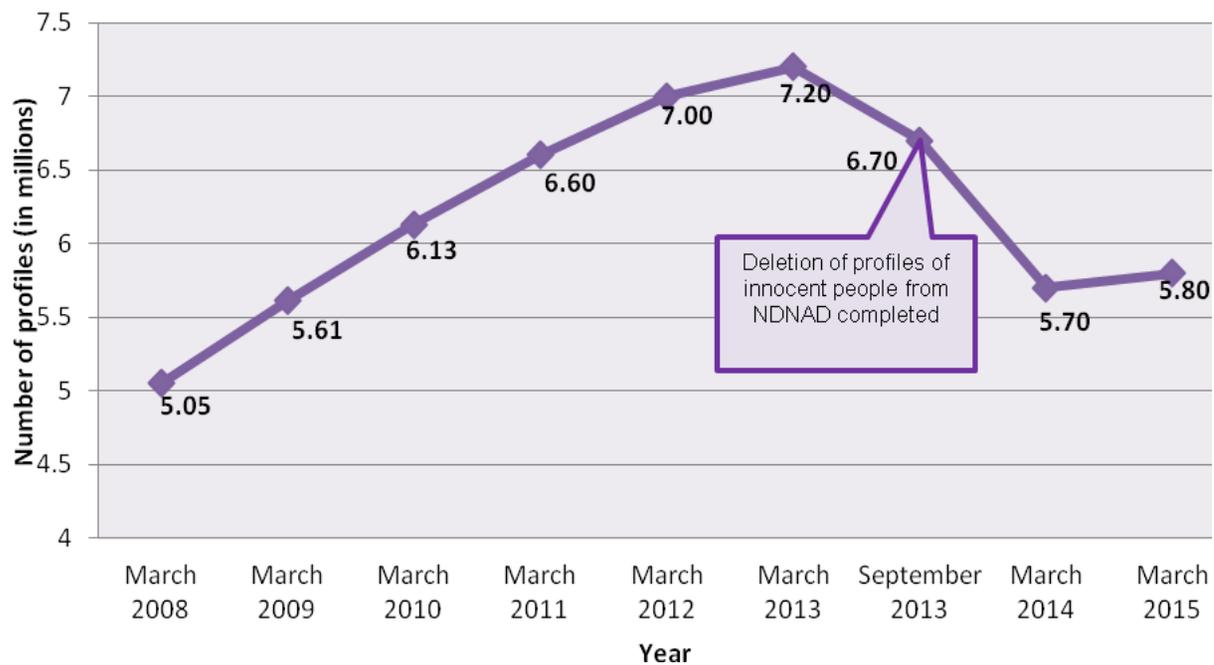
- DNA from an individual who is arrested for a recordable offence when searched against the NDNAD and may provide a link with DNA previously recovered from a crime scene
- DNA recovered from a crime scene and searched against the NDNAD may provide a match with an individual who has been previously charged/convicted for a recordable offence
- DNA recovered from a crime scene may match with another crime scene revealing serial offending and enhance the ability to detect both crimes
- DNA recovered from the crime scene or victim that is thought to have originated from the offender can be used to screen volunteers as a way of eliminating individuals from an enquiry.
- in serious cases with the authority of a Chief Officer a familial search can be undertaken of an unidentified DNA profile to reveal whether there are any close relatives on the NDNAD.

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### National DNA Database (NDNAD) key statistics

#### Number of subject profiles held on NDNAD (in millions) (2008/09-2014/15)



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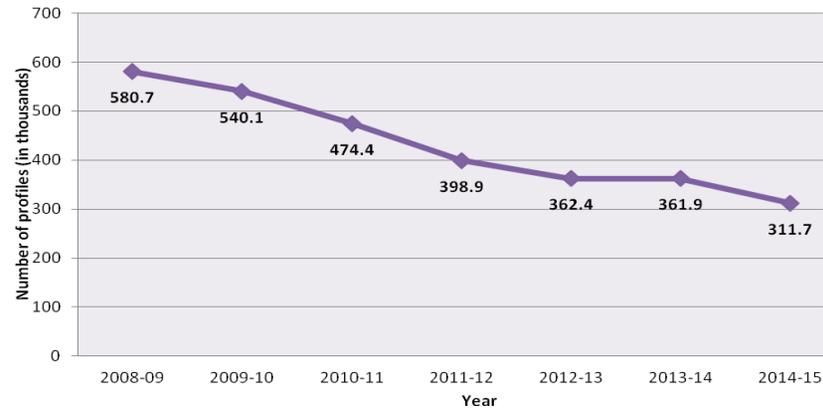
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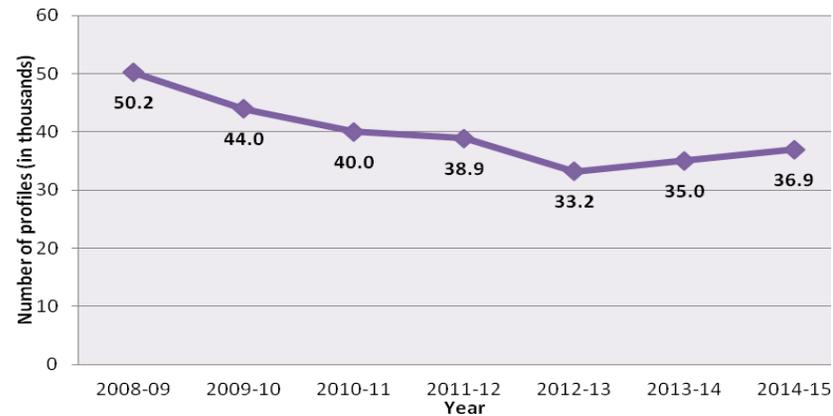
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## National DNA Database (NDNAD) key statistics

**Number of subject profiles loaded onto NDNAD per year (in thousands) (2008/09-2014/15)**



**Number of crime scene profiles loaded onto NDNAD per year (in thousands) (2008/09-2014/15)**

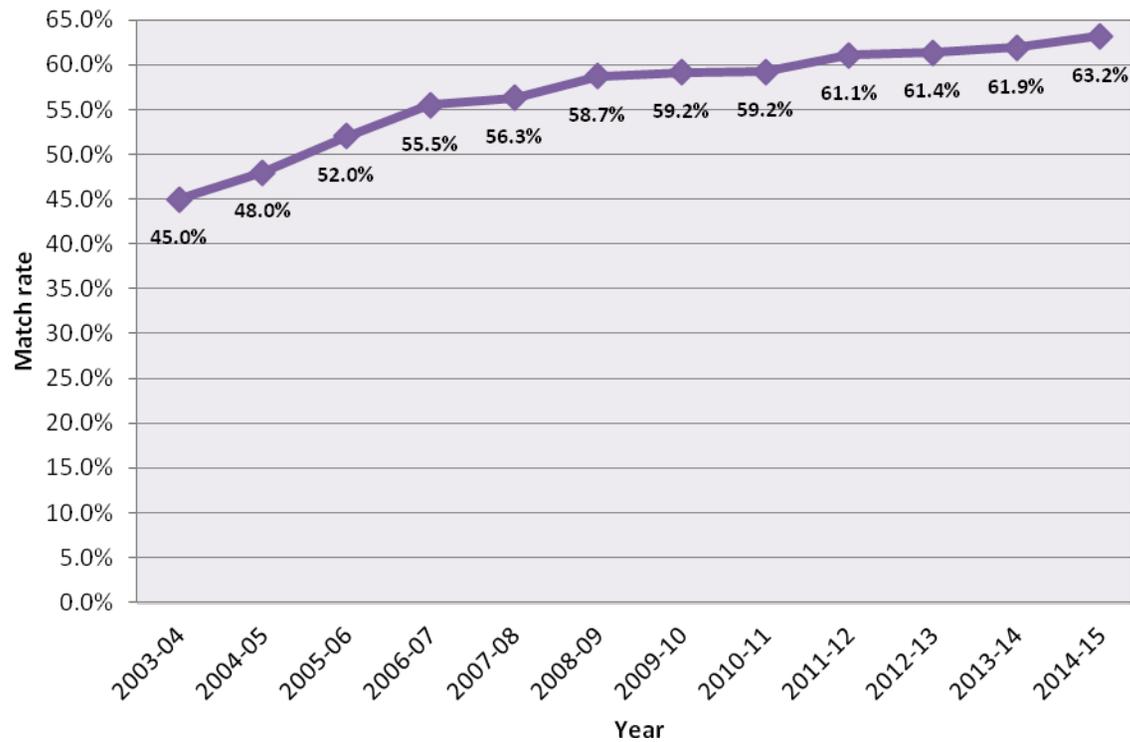


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## National DNA Database (NDNAD) key statistics

### Match rate on loading a crime scene profile (2003/04-2014/15)

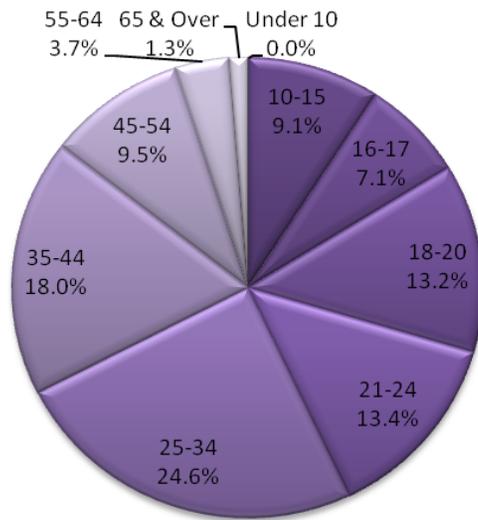
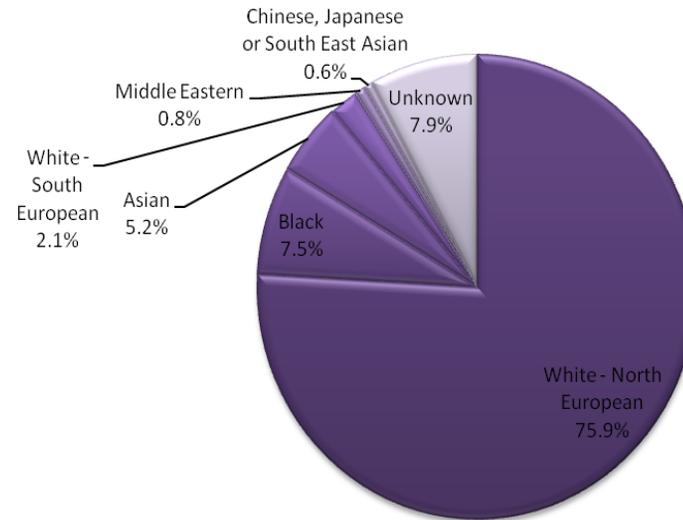


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## National DNA Database (NDNAD) key statistics

Number of subject profiles on NDNAD by ethnicity (as at 31st March 2015)



Number of subject profiles by age on NDNAD (as at 31st March 2015)

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### **DNA Profiling in Acquisitive Crime (Burglary and Vehicle)**

- Main contribution is to provide a name as a starting point for investigation, this may lead to arrest and charge, and prosecution but relies on other evidence, and an assessment of the location and relevance of the DNA at the crime scene
- decision to charge is taken by the CPS and they make their own assessment; movable objects such as cigarette ends are problematic and require a dialogue between forensic staff and prosecutors

#### **Moveable Object**

' ...a carelessly discarded porcelain toilet causing £15k damage to a Ferrari.....'



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### **MPS Cold case review – Operation Sapphire**

- 364 cold cases submitted for re-examination
- 340 DNA profiles obtained that were not from the victim
- 198 matches to suspects; 63 have been prosecuted, 45 pleaded guilty and 18 convicted by a jury
- 12 outstanding unsolved linked series profiles- Specific cases;

Subject A pleaded guilty to six indecent assaults over a seven year period and received a sentence of 13 years

Subject B convicted of 3 rapes received a sentence of 14 years

Subject C pleaded guilty to rape and sexual assault on three women and received a sentenced of 12 years

Subject D raped a tourist in London victim returned to the UK waived her anonymity and rapist found guilty and received a sentence of 12 years

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### **Current Operational Capability**

- Well developed DNA matching service
- Human Rights and Privacy issues addressed? but is the focus punishment not prevention
- Still some capability challenges;
  - cell type
  - complex mixture interpretation
  - international searching e.g. Prüm
- Well developed fingerprint capability for large scale identity management
- Facial identification under development

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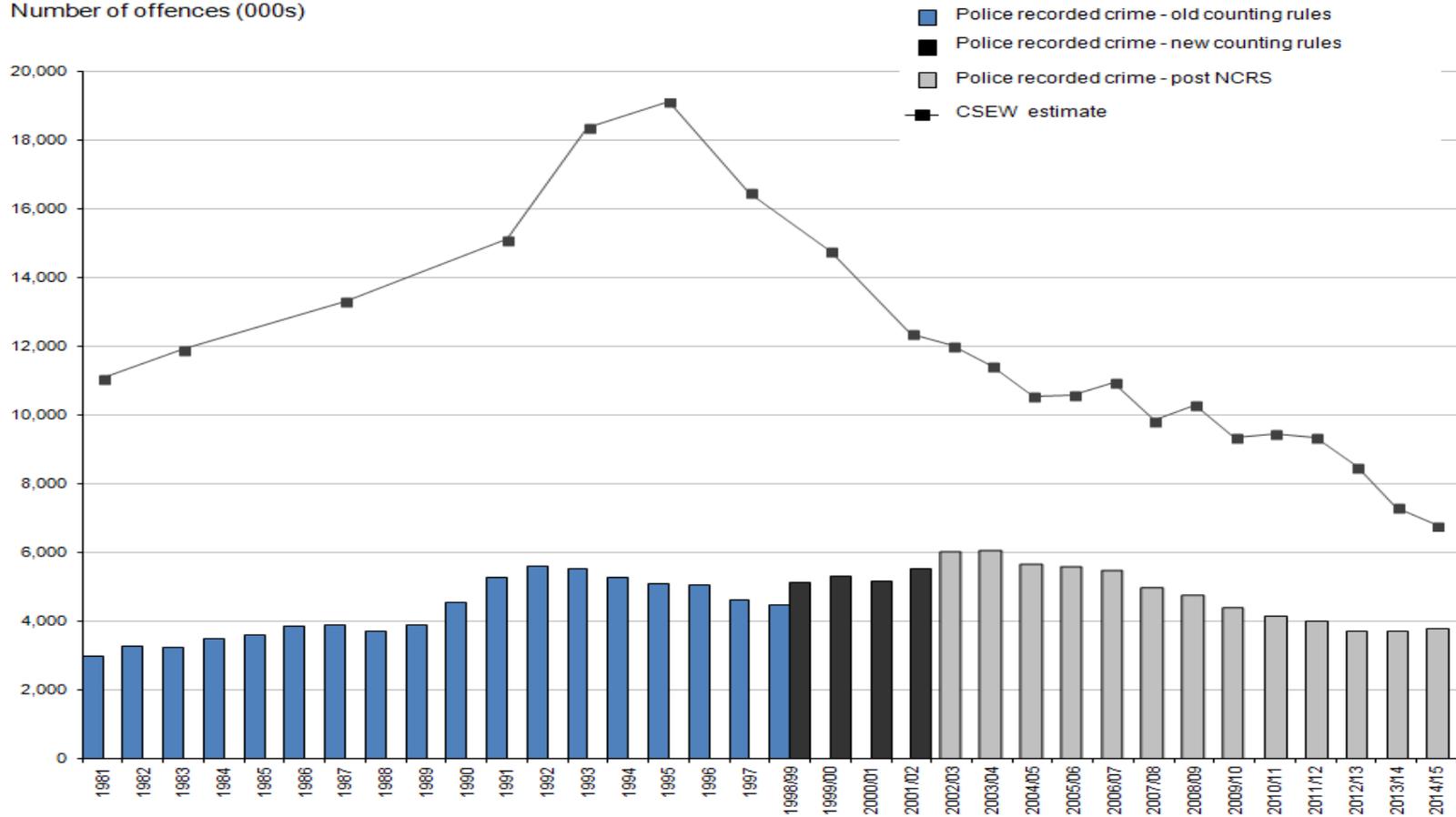
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### **Future Challenges and Opportunities for Forensic Genetic analysis**

- General levels of crime
- Violent Crime including Homicide
- Rape and Sexually Motivated Crime
- Terrorism

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Number of offences (000s)

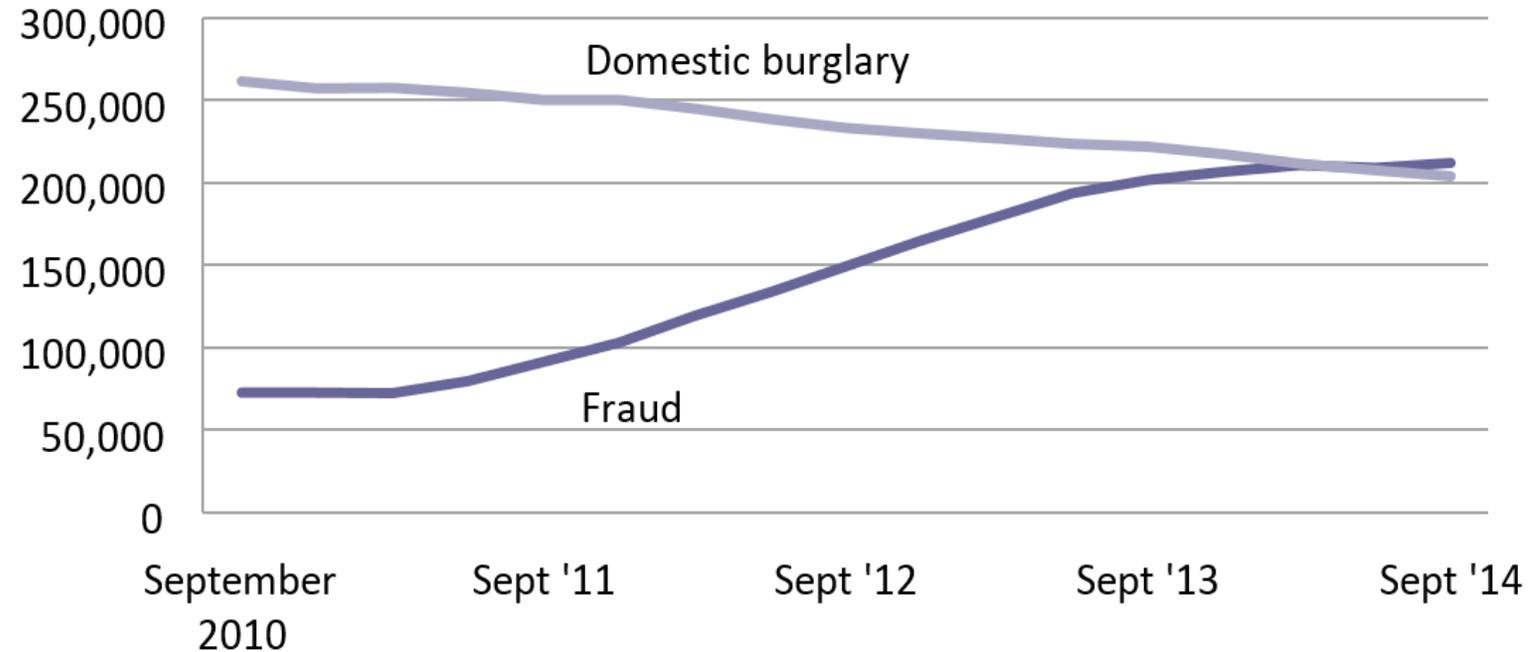


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### **Chart 1: There are now more frauds reported to the police in England and Wales than there are domestic burglaries**

12 month rolling year total number of offences



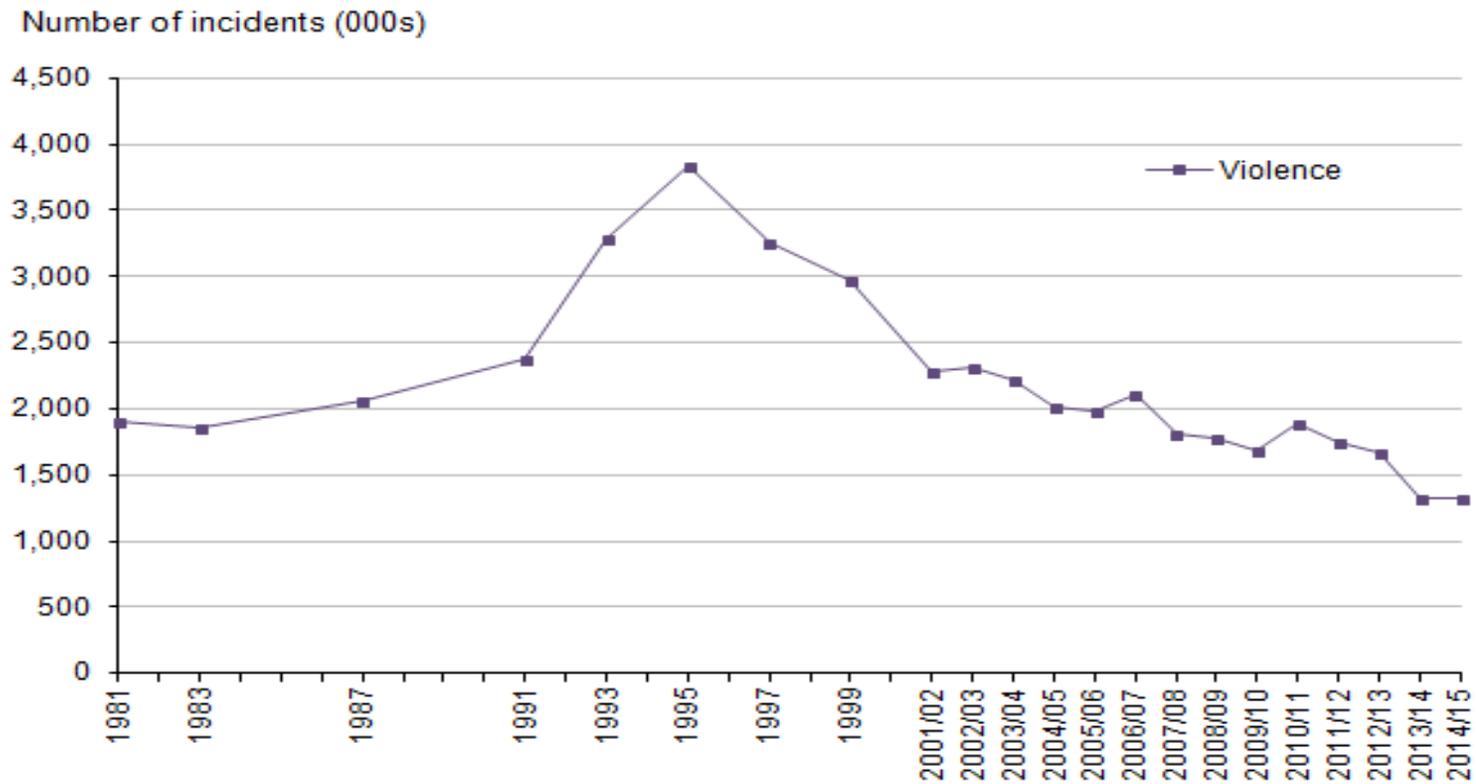
Source: ONS crime statistics, year ending September 2014

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## Violent crime



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### Violent crime

Police recorded violence against the person - number and rate of offences

#### England and Wales

	Apr '04 to Mar '05	Apr '09 to Mar '10	<b>Apr '13 to Mar '14</b>	<b>Apr '14 to Mar '15</b>
<b>Violence against the person offences</b>	845,673	699,011	<b>634,623</b>	<b>779,027</b>
Homicide	868	620	<b>533</b>	<b>534</b>
Violence against the person - with injury	515,119	401,244	<b>322,818</b>	<b>374,216</b>
Violence against the person - without injury	329,686	297,147	<b>311,272</b>	<b>404,277</b>
<b>Violence against the person rate per 1,000 population</b>	16	13	<b>11</b>	<b>14</b>

1. Source: Police recorded crime, Home Office

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### **Homicide Categories**

#### **Category A:**

All cases that are 'hate' motivated, crime causing grave public concern or where the victim is a child, law enforcement officer or person of high public profile.

#### **Category B:**

A routine major enquiry where the offender is unknown and not readily identifiable.

#### **Category C:**

A routine major enquiry where the offender is apparent.

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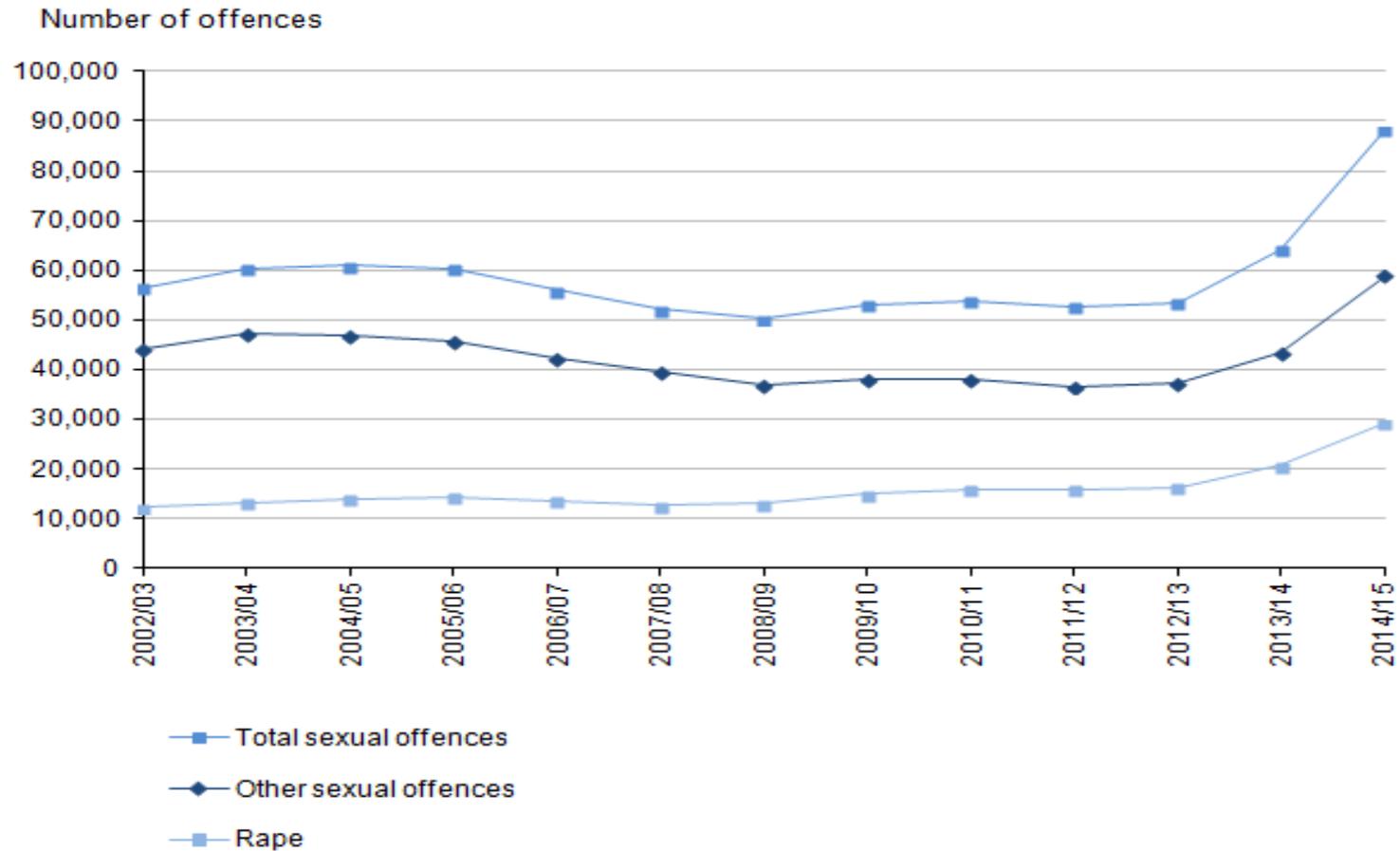
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### MPS Homicide Data 2014-15

Category	Manslaughter	Murder	Grand Total
A		12	12
B	1	41	42
C	6	28	34
Not stated	2		2
Grand Total	9	81	90

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## Sexually motivated crime data



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### **Sexually motivated crime data**

#### **Police recorded sexual offences - number and rate of offences**

##### **England and Wales**

	<b>Apr '04 to Mar '05</b>	<b>Apr '09 to Mar '10</b>	<b>Apr '13 to Mar '14</b>	<b>Apr '14 to Mar '15</b>
<b>Sexual offences</b>	60,924	53,006	<b>64,229</b>	<b>88,219</b>
Rape	14,013	15,074	<b>20,748</b>	<b>29,265</b>
Other sexual offences	46,911	37,932	<b>43,481</b>	<b>58,954</b>
<b>Sexual offences rate per 1,000 population</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>

1. Source: Police recorded crime, Home Office

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### **MPS Sexually motivated crime data 2014-15**

<b>Victim Suspect Relationship Description</b>	<b>Total</b>
Acquaintance/Friend	1217
Familial - Including Family Friends	191
Intimate - Current or Previous Sexual Relationship	1407
Professionals and Carers	54
Relationship Not Known	247
Stranger 1 - No Prior Contact with Victim	415
Stranger 2 - Briefly Known to Victim	806
No description	788
<b>Grand Total</b>	<b>5125</b>

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## Counter Terrorism applications

Taxi driver Anis Sardar has been convicted of the murder of US Sgt Randy Johnson, who was killed by a homemade bomb while on patrol in Iraq eight years ago, and it was a piece of sticky tape that gave him away.

### **Fingerprints matched**

***Parts of the bombs, including the one which killed Sgt Johnson, were sent to the FBI's Terrorist Explosive Device Analytical Centre in Quantico, Virginia, where a massive warehouse houses tens of thousands of IEDs from Iraq and Afghanistan.***

***Forensic scientists extracted fingerprints from four devices that Sardar's bombmaking team had assembled.***

***In early 2014 they matched prints on two of the bombs to Sardar. This was possible because when he had re-entered the UK after fleeing Iraq in 2007, Sardar was questioned by officers at Heathrow Airport. Although he was not arrested, his fingerprints were taken.***

***American scientists also found on each of the devices, including the bomb which killed Sgt Johnson, the fingerprints of fellow bombmaker Sajjad Adnan who was briefly detained by American forces but whose current whereabouts are not known.***

***So although Sardar's prints were not found on the lethal bomb, he was convicted of the murder as part of a joint enterprise with Adnan: their four bombs being very similar in design and placed very close to each other.***



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