Session Two - *Research Studies*

What is the availability of operational and research studies of the uses of FB in E & W and elsewhere.

Key questions:

- What studies currently exist?
- What methodologies do they use?
- What are their findings and what efforts have been made to collate and compare such findings?
- What uses are made of these operational and research studies, and how are their results disseminated to professional communities and the wider society?

Research on 'Uses'

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- Main focus on peer reviewed social science studies of 'police uses'. (largely dominated by Home Office funding and dissemination routes).
- Some overlap with actors and agents that collect and interpret data discussed in Session One (e.g. HMIC, Home Office Expansion Programme, NDNAD, Police Standards Unit)
- Not here considering publications describing natural science discoveries and/or technological innovations in forensic bioinformation.

Approaching 'Police Uses': A Persistent Orthodoxy

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- *March 1st 2006 Hazel Blears at House of Commons:* Information on the number of serious crimes such as murder, manslaughter and rape that have been detected using DNA profiles taken from suspects who had previously been arrested, charged but not convicted of an offence is not collected by the Home Office as detections are achieved through integrated criminal investigation, and not by forensic science alone.
- *March 3rd 2009. Alan Campbell Written Answer*: Figures for the number of crimes detected in which a DNA match was available only include crimes detected in which a DNA match was reported by the NDNAD. They do not include DNA matches which arise through case work in serious crime…this data is not collected centrally. It is also important to note that detections are achieved through integrated criminal investigation, not through DNA alone.
- **A reflection of organisational reality or criminal justice rhetoric?**

The Persistent Orthodoxy In Practice

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Two co-existing approaches to maximising (and researching) the effective uses of forensic science:

'Organic' model in major and serious crime investigation:

- Utilise wide range of technologies with relevant expert support.
- Forensic bioinformation integrated into co-ordinated investigation
- Forensic science as service provision.
- Sparse UK research literature; operational practice normalised and disseminated in key manuals e.g. Murder Manual.

The Persistent Orthodoxy In Practice

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'Procedural model' in volume crime investigation:

- Maximise managerial knowledge & control of performance.
- Forensic bioinformation integrated into attrition model.
- Small range of forensic commodities 'delivered' to other investigators.
- Larger UK research literature heavily dependent on data shaped by existing organisational understandings and imperatives.

Does the orthodoxy exist? If so, how established/maintained and with what effects?

Focus on Major and Serious Crime

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Innes (2003) *Investigating Murder: Detective Work and the Police Response to Criminal Homicide.* Ethnographic fieldwork & analysis of case files. No extensive treatment of forensic bioinformation – glossed as an expert knowledge production technology not always well understood by detectives.

Roycroft (2007) 'What Solves Hard to Solve Murders'. *Journal of Homicide and Major Incident Investigation.* Interviews with 32 met sio's about Cat A & B homicides: 'forensic material' contributed to the solution in 38% of the cases. No details of what or how.

Nicol et.al.(2004), *Reviewing Murder Investigations.* Study of the process and documents of 34 Murder Reviews. Reviewers noted shortcomings in forensic recovery at scenes in about 12% of cases and in the commissioning of tests on recovered evidence in a smaller number. Few details supplied

Good Practice Guides: PSU - *Cold Case Reviews: Familial DNA Intelligence Products;* FSS – *Guide to Intelligence Led Mass Screening*; ACPO *DNA Good Practice Guide.* Mixture of empirical and normative claims

What other studies/sources exist? What do they tell us about the uses of forensic bioinformation to support the investigation of major and serious crime? What uses are well/less well considered?

Volume Crime & Forensic Bioinformation Claims-Making (i)

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The FSS General Crime Reduction Model for Property Crime (1999). 'Year One'

- Step One: 'Recovery efficiency': 22% of crimes scenes examined will yield CTM (some scenes more than one type).
- Step Two: 'Matching efficiency': DNA@30%; fingerprints@20%; Footwear @5%; Toolmarks@2%.
- Step Three: 'Detections': 60% of matches will produce detections.
- Step Four: 'Additional Admissions'. each primary detection will lead to 2 further admissions.
- Step Five: 'Subsequent Deterrence': Each crime detected will deter a further two crimes.
- **What pedigree? What data used? With what effect?**

Volume Crime & Forensic Bioinformation Claims-Making (ii)

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The Morgan Harris Burrows Model of the Impact of Forensic Science in the Detection of Volume Property Crime (In Burrows et al (2005) *Forensic Science Pathfinder Project: Evaluating Increased Forensic Activity in Two English Police Forces)*

The new model: introduced attendance rates as important variable; considered convictions; abandoned estimate of deterrence. Predicted that 3.3% of recorded burglary and vehicle crime offences would be detected from fingerprints and SGM+DNA.

Research findings included:

- forensic identifications (FPs and DNA) provided first link to the suspect in 45% of cases;
- 75% 'contributed to case-building'
- 27% did not lead to a detection (legitimate access, suspect not found, partial DNA hit, further proceedings not in public interest)

More From Pathfinder:

Key messages:

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- 100 burglary and vehicle crime scenes will typically yield seven fingerprint idents, 2.6 SGM plus idents and 1.4 LCN DNA matches;
- for every 100 forensic idents an average of 101 detections are obtained;
- forensic science is a contributory factor (but not necessarily the critical factor) in achieving one third of the detections of burglary and vehicle crime offences achieved in England and Wales
- typically 100 idents will yield 79 convictions, cautions or TICs.

More From Pathfinder:

Key messages:

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The most important improvements in detections will be obtained from improving performance between scene attendance and identification. So issues are

- Increasing the number of crime scene examinations.
- Improving the recovery of contact trace material at crime scenes visited. (use could probably be made of enhanced techniques such as LCN).
- Boosting ‘match rates’ through more comprehensive coverage of suspect forensic databases.

What quality/significance/influence/continued relevance?

Other Relevant UK Volume Crime Attrition Studies

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Tilley, N. and Ford, A. (1996). *Forensic Science and Crime Investigation*. London: Home Office.

McCulloch, H. (1996). *Police Use of Forensic Science*. London: Home Office Police Research Group.

McCulloch, H. and Tilley, N. (2000). *Effectiveness and Efficiency in Obtaining Fingerprint Identifications*. London: Home Office: (unpublished report).

Prime, R. and Hennelly, L. (2003) *Effects of the Processing of DNA Evidence*. London: Home Office.

Morgan Harris Burrows (2004) *The processing of fingerprint evidence after the introduction of the National Automated Fingerprint Identification System (NAFIS).* London: Home Office

Williams (2004) *The Management of Crime Scene Examination in Relation to the Investigation of Burglary and Vehicle Crime*. London: Home Office

Webb, B., Smith, C., Brock, A. and Townsley, M. (2005). 'DNA Fast-tracking' in Smith, M.J. and Tilley, N. (eds.) *Crime Science: New Approaches to Preventing and Detecting Crime*. Cullompton: Willan.

Burrows et.al. (2005) *Understanding the Attrition Process in Volume Crime Investigations*. Home Office Research Study 295

Other studies before or since 2005 to be added to this list?

Burrows et.al. (2005)

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8 BCUs studied. Research included a 'cohort review' of 3,022 cases detected and undetected burglary and vehicle crimes in 2003/4.

' Physical evidence' (FP, DNA, video);

- was 'first link to suspect' in 24% of direct detections
- Was 'principal information enabling detection in 27% of direct detections

But:

- No clear relationship between high proportion of forensic matches and high detection rates
- 'Huge' variation in attendance rates by crime type and BCU
- Marked difference in recovery rates and 'overall benefits' from application of forensic techniques

Conclusions/Implications re the use of forensic bioinformation:

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- Heavy investment has supported increased success at inceptive applications
- More effective screening may lead to more efficiencies in application
- Scope for improvement beyond attendance and recovery stages (but only custody fingerprinting and DNA sampling given as examples).
- A general concern with the possible impact of two ideal-type approaches to investigating volume crime ('discretionary' and 'procedural'), and a proposal to design experimental studies with this in mind
- **What significance? How useful for assessing uses of forensic bioinformation?**

‘Northampton Studies’

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Bond, J.W. (2007) ‘Value of DNA evidence in detecting crime’, *Journal of Forensic Sciences*, 52: 128–36.

Bond, J.W. (2007) ‘Maximising the opportunities to detect domestic burglary with DNA and fingerprints’, *International Journal of Police Science and Management*, 9: 287–98.

Bond, J.W. and Hammond, C. (2008) ‘The value of DNA material recovered from crime scenes’, *Journal of Forensic Sciences*, 53: 797–801.

Adderley, R. and Bond, J.W. 2008. 'The effect of deprivation on the time spent examining crime scenes and the recovery of DNA and fingerprints'. *Journal of Forensic Science* 53: 178-182.

‘Northampton Studies’ Some sample findings:

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- An increase in the proportion of scenes attended and decrease in processing time for DNA and fingerprints produced more idents and hits used by investigating officers
- Variables determining the likelihood of successful DNA recovery and use in achieving detections include:
  - Level of experience and accreditation of examiners
  - Source of DNA (the more ‘mobile’ the less likelihood of succesful detection)
  - Level of experience and accreditation of investigating officers

Other studies of this kind?

Systematic Reviews and RCTs On Police Uses of Forensic Bioinformation

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Bradbury & Feist (2005) *The Use of Forensic Science in Volume Crime Investigations: A Review of the Research Literature.* London Home Office

Roman et.al. (2008) *The DNA Field Experiment: Cost Effectiveness Analysis of the Use of DNA in the Investigation of High Value Crimes*. US Department of Justice

Wilson & Weisburd (in progress) '*DNA Testing in Criminal Justice*' International Campbell Collaborations

Others – in progress, in press or published?

Roman et.al. (2008) *The DNA Field Experiment*

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5 local law enforcement agencies between 2005 & 2007. 2,160 burglary cases in which 'physical evidence thought to include suspect DNA was collected'.

Randomly divided into test and control cohorts, physical evidence processed only in test cohort.

Outcomes observed October 2007. Findings include:

- Suspects identified in 29% of test cases and 11% of control cases;
- Suspects arrested in 22% of test cases and 10% of control cases
- In cases where both DNA and fingerprint evidence were collected, CODIS matches were twice the rate of AFIS idents

Roman et.al. (2008) *The DNA Field Experiment*

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- Blood and saliva samples more likely to yield usable profiles than touch samples
- Unlocked crime scenes and those investigated during 'busy' officer times are less likely to yield profiles
- Evidence collected by crime scene technicians no more useful than those collected by patrol officers
- The collection of 'whole items' is more likely to generate profiles than those swabbed
- Additional cost of DNA testing is $1,400, cost of identifying an additional suspect is $4,502; cost of arresting an additional suspect is $14,169

Usefulness? Relevance to UK? Capable of replication/development?

Summary Observations on Current Research

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- Regular contrast of imaginary with actual performance;
- Volume crime heavily researched; major and serious crime under-researched
- An over-emphasis on attendance and recovery issues; under-emphasis on subsequent trajectories of artefacts and use of intelligence by investigators or prosecutors;
- Frequent unexplicated references to contact trace material as 'of value' to investigations.

Summary Observations on Current Research

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- Over-emphasis on fingerprint ident or DNA match as ‘first link’; under-emphasis on other uses/findings including exclusionary uses
- Persistent use of small range of explanatory concepts e.g. ‘Performance Culture’; ‘Leadership’, ‘Skill’, ‘Experience and accreditation’;
- Absence of mechanism for accumulating and disseminating studies.
- **Additional/Corrective Observations?**