SEXUAL OFFENCE INTELLIGENCE: PROACTIVE APPROACHES FOR POLICE

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WITH THE CURRENT CLIMATE OF VIOLENT ATTACKS AGAINST WOMEN, children and the elderly in their homes, the community looks to government to provide a better means of protection and detection. Increased police numbers are discussed on an annual basis and the lengths of sentences given to convicted persons draw significant space in the media. However, other agencies also have a role to play in the investigation of serious crime. Through the development of new techniques and information storage systems, the State Forensic Science Laboratory (SFSL) in Victoria is one such organisation assisting the criminal justice system.

Although the incidence of reported sexual crime is approximately 1,000 per year (Victoria Police 1992) only about 350 cases per year are delivered to the SFSL for forensic examination. The large discrepancy in these figures is generally explained by a lack of evidence. The complainant may not report the incident for several days or longer for a variety of reasons. Bathing or washing, to rid the body or clothing of any connection to the assault, lessens the possibility of detecting biological material. In cases of incest, it may be many years between the offence and the report and often the scene of the attack is the offender's own bed. Additionally, the examination of exhibits in sexual crimes may not yield any semen despite rapid reporting to the authorities and a prompt medical examination. In such cases, the offender may have difficulty obtaining or maintaining an erection or be unable to ejaculate. Increased awareness of the potential probative value of semen may influence the offender to attempt to render it inaccessible to the scientist. Use of a condom, cleaning up the victim by washing, having the victim swallow the ejaculate following fellatio or simply not ejaculating are methods encountered.
Of the crimes submitted, 50 per cent will have suspects and approximately 20 per cent will never proceed. The remaining 30 per cent represent cases with no known offender. Due to staff shortages and pressing deadlines, it is often tempting for the forensic laboratory to only concentrate on cases with offenders or urgent investigative requirements. Nevertheless, the latter 30 per cent of non-offender cases represent real victims and, although extensive scientific analysis is not required, the exhibits are ‘screened’ for potential evidence and those samples thus generated are stored awaiting future analysis should a suspect be identified. This process has been on-going at the SFSL for the past nine years.

In approximately 75 per cent of cases presented at court, consent is the issue in dispute (Victoria. Director of Public Prosecutions 1992, pers. comm.) and, therefore, little scientific analysis in regard to the biological evidence is required. The presence or absence of damage on articles of clothing is far more significant. It is the remaining 25 per cent of cases that require an extensive scientific examination to assist in exculpating or inculpating any suspects presented. However, any case, regardless of defence, may contain information linking that case or individuals to other serious crimes.

It is in the area of linking cases at the earliest possible point in an investigation that the SFSL is endeavouring to establish a sexual offence intelligence capability. Such proactive analysis is important when little other information is available to pre-determine said associations. Once in place, a significant level of detection will be available.

**Background/Development**

Traditionally, the provision of an intelligence service has been based on *modus operandi* (MO) information supplied by police investigators. However, forensic laboratories have a large amount of information on cases in their archives which has the potential to disclose information that would be of considerable assistance to criminal investigations.

In 1983, the SFSL contacted investigating police within the state of Victoria by means of a questionnaire, seeking information on the type of offence and the recent medical/sexual history of the complainant. The motivation for obtaining such information was born out of the need to provide a more professional scientific service to the courts. Although comprehensive data of spermatozoa survival following sexual intercourse in a variety of orifices had previously been published (Willott & Allard 1982; Enos & Beyer 1978; Lewington & Williams 1979), not all the data reflected casework situations as experienced by the SFSL.

Higgs and Willott (1988) from the Metropolitan Police Forensic Science Laboratory, London, developed a computer system described as the 'Sexual Assault Index'. It was hoped that this 'index' would provide the means to collate and rapidly re-call data obtained from the SFSL manual questionnaire system. A copy of the program was graciously supplied to the SFSL, but unfortunately, it concentrated on MO-based questions and did not answer those scientific questions considered to be of paramount importance. Although a significant development, the information comprised only a small proportion of MO questions already offered in the Crime Department of Victoria Police.

In an attempt to include some MO information that still had a high degree of impact on the scientific interpretation of results, a new and essentially complete form was produced and is still in use today. Once completed by the investigator, it is submitted to the SFSL along with a copy of the complainant's statement and details of any specific examinations required. This entire package assists the scientist in the determination of which tests are
needed to obtain the maximum evidence available. It is also the beginning of the intelligence process. The concept of sexual offence intelligence is not unique (Keating 1988; Keating, Higgs, Willott & Steadman 1990; Davies 1991), but the package described in this paper incorporates a team approach which includes the investigator, medical officer and forensic scientist.

**The Sexual Offence Intelligence System**

The Sexual Offence Intelligence system (SOI) has three main objectives:

- to provide scientific information on aspects of sexual offence cases as required of an expert witness in a Court of Law.
- to provide a database for examining and tracking possible serial offences and offenders; and
- to provide for a professional approach to casework management, with particular emphasis on priorities and efficiencies.

To achieve these objectives, the SOI consists of a manual questionnaire (as supplied by Police, medical and scientific staff) and two computer programs capable of rapid cross-referencing and searching.

Never intended to replace MO systems, but rather to complement them, the SOI should provide for the possible matching of cases when MO information is vague or inconclusive. Naturally, a high level of confidentiality exists surrounding all reports and information gathered and supplied.

**The manual system**

The manual system is dependent on the correct and rapid return of the original questionnaire (RECSO). Once the scientific examination is completed (using conventional techniques), a second form (RESSE) is filled out by the casework manager. If required, a third form (DNA res) is completed by the molecular biology casework manager and details some aspects of the DNA profiling technique. The scope of the information supplied on each form is as follows:
Without Consent: Confronting Adult Sexual Violence

**RECSO**

- the offence including location, time and date;
- the medical, including medical officer, time and date;
- the complainant's medical history;
- the complainant's recent sexual history including any contact with other partners;
- the use of any lubricants or foreign objects; and
- the offender as described by the complainant.

**RESSE**

- the samples supplied for examination;
- the condition of the samples (wet, dry);
- the presence of any interfering substances (for example, blood, faeces, saliva, urine) that may inhibit the interpretation of any or no results obtained;
- identification test results for semen; and
- comparative test results (ABO grouping and PGM typing) of seminal stains, swabsticks and blood samples.

**DNA res**

- information required to set priorities in casework management;
- the strength of the samples submitted based on spermatozoa numbers or the size of blood stains;
- the DNA profiling of blood stains;
- the results obtained
- the progress of the analysis (necessary when court deadlines are being considered).

*The computer system*

The first computer system incorporates the information from the manual system previously described. Data is recalled by using an 'ad-hoc' menu of fields in combination with one another. This system is currently run on a Prime mini-computer, model 9750, and operates under Prime Information developed in Info/Basic using a system development tool 'Advanced Generation'.
The second computer system is a database generated from the DNA profiles of samples supplied by the original casework manager. Included are samples from suspects, complainants and any partners. The files are searched immediately the new DNA profile has been entered. Simply, the following question is asked: ‘Has this profile been seen before?’ Any matches obtained (within certain tolerances) are then manually retrieved and reviewed for any probative value on even stricter criteria. This system is currently run on a Personal Computer using dBase IV software.

On a routine basis or when urgently requested, the files are searched for evidence of serial offences or scientific knowledge required in court.

The SOI seeks to answer questions pertaining to scientific and statistical information for courts of law. These include: the survival time of spermatozoa in body cavities; the ageing of seminal stains; the success rate of conventional blood grouping/typing or DNA profiling given particular conditions such as the relative strength of the samples tested; the success of detecting seminal stains after machine or hand washing; the effects of personal hygiene on the detection of spermatozoa; the effect of interfering substances (such as contamination) on any expected results; and the number of cases that have been examined where combinations of sexual acts have occurred; for example, oral and anal.

The SOI also assists in operational investigations by questions based on the MO information from the forms completed such as time, date, suburb of the offence, type of motor vehicle used, words spoken, weapon used, type of sexual acts and unusual characteristics of the offender (any combinations are possible) and by comparison of the scientific results on either a case vs case or case vs suspect criterion.

**Scientific Evidence**

In order to have an understanding of the capabilities of the SOI, a brief review follows of the types of biological scientific testing that is currently in use at the SFSL. The evidence available falls into one of two categories.

*Conventional systems*

The forensic biologist not only analyses exhibits from individuals but can attend, examine and collect for further testing, various biological substances from crime scenes. Such exhibits may include articles of bedding, clothing, furniture and motor vehicles or external areas that have been identified as the possible crime scene. Most testing at scenes is of a presumptive nature and requires confirmation in the more controlled environment of the laboratory. Some are immediately interpretative and provide assistance to the investigator in the field. Blood stain pattern (blood dynamics) interpretation is such an example.

Blood, semen, hair, skin, saliva, nails and vaginal secretions provide, to varying degrees, information that categorises individuals based on biochemical and/or immunological markers. Urine, faeces and vomit, however, are substances that can only be identified as such, and therefore only provide corroborative evidence. The ability of any of these tests to give meaningful results diminishes with the age of the stain, but this trend can be arrested to some degree if the samples of interest are identified and then stored away in ideal conditions (usually −70°C).

The discriminating power of a technique is its ability to differentiate between individuals selected at random. Although having sufficient discrimination to exculpate individuals,
techniques in the conventional category have limited use in inculpating individuals with particular crimes. The analysis of semen, for example, has only two blood grouping/typing systems in use at the SFSL. In contrast, blood has a wider range of polymorphic systems from which to exculpate an individual. DNA profiling provides an even greater degree of discrimination. However, when semen is identified in the absence of spermatozoa, DNA profiling cannot be used and the probative value of the evidence relies on conventional techniques. In one serial rape case in Victoria, at least twenty suspects were eliminated from the inquiry by using conventional methods (PGM typing).

In general, the conventional methods are cost-effective and the results are obtained rapidly thus proving to be a substantial investigative tool. It is these results that are entered on the RESSE form in the SOI system. For further detailed information regarding forensic biology the reader is directed to the review by Raymond (1993).

DNA profiling

It is because of the inability to adequately distinguish between individuals using conventional techniques that DNA profiling has been utilised. DNA profiling has undergone a continuous state of flux ever since it was first introduced. Controversy and change have been ongoing; not surprisingly, considering the overwhelming weight of evidence produced if not challenged.

The traditional method associated with the technique used at the SFSL is called Restriction Fragment Length Polymorphism (RFLP). The DNA is cut into small fragments by an enzyme (restriction endonuclease), separated according to size by applying an electric current across an agarose gel matrix, transferred to a stronger matrix (the Southern blot) and identified by annealing radioactive labelled complementary DNA fragments (or probes) to the fragments separated. The resulting pattern when visualised on X-ray film is similar to the 'bar-codes' observed on supermarket articles. Although providing a high discriminating power, it is also time consuming and requires a relatively large sample. In addition, problems are encountered when the sample tested is mixed with substances such as soil or faeces. Interpretation is achieved by placing 'bins' or 'windows' around each band visualised on the x-ray film. RFLP results are recorded on the dBase IV computer program.

In recent times, new technology has been developed that allows smaller samples to be profiled at a lower cost and in a shorter time. Second generation DNA profiling uses the Polymerase Chain Reaction (PCR) as an integral part of the procedure. DNA is prepared from samples and amplified to provide a workable number of copies of the original. Interpretation can be either by a 'dot-blot' method where known DNA types are impregnated into a paper matrix, or by the separation methods similar to those used in RFLP technology. The final result is more easily interpreted than RFLP analysis although contamination from material such as vaginal secretions must be taken into account by analysing all relevant blood samples; that is, complainant, suspect and any other sexual partners.

This second generation DNA technique is the basis of the SOI system. The results obtained can be entered on either of the computer systems. Since results can be obtained in a shorter time frame than for RFLP analysis, DNA profiling is now a useful investigative tool. For further details on DNA profiling the reader is directed to the review by Gutowski (1993).
Casework Applications

As previously discussed, the main thrust of the SOI system was to provide information for the scientist when attending court and to assist in the identification of serial offences and/or offenders. It is the latter aspect that has direct impact on investigative policing.

Serial attacks can be indicated through MO information and a list of such crimes given to the SFSL. Conventional and DNA testing may be required to confirm the link between each offence. In some instances, the number of cases originally attributed to a particular offender have decreased. The SOI system aims to accelerate this process and also, as has been the case already, widen the inquiry.

Over the past few years, a serial rapist was attacking women primarily in one or two neighbouring suburbs of Melbourne. Originally the cases were linked by the investigating police via MO information and a conventional and DNA profile provided by the SFSL. As part of normal procedure, another rape case was brought to the SFSL from a substantially geographically separated suburb. The urgency to process this case arose from the need to eliminate a suspect being questioned. Although the suspect was indeed eliminated, the seminal stain located on the victim's clothing was established to have the same PGM type and PCR type as the serial offences previously analysed. Following this information, the direction of the investigation was altered and the inquiry widened. Eventually, a suspect was located and charged with all of the offences. Prior to the SFSL intelligence, no connection between the cases had been made.

The importance of highlighting such an example is to stress the need for cooperation and a team approach to investigating crime. Although the SFSL did not provide the identity of the offender (diligent police work provided this link), without the scientific input it would have been doubtful if any connection between the various suburbs would have been made. If a suspect had been previously convicted of a sexual offence and had supplied a blood sample as a consequence of that prior event, then the SOI system should have identified that individual.

The numbers of cases in the database are as yet very limited and, therefore, the full impact on investigation is yet to be fully tested. Other examples of serial offences have occurred over the past five years indicating a need for an operational system. Additionally, if a case is to be contested on consent, or the victim has by public opinion a degree of lack of respectability, then an acquittal or a failure to prosecute may be the outcome. However, if the same suspect is identified as having participated in several similar-fact crimes of sexual assault then each victim gains credibility and a successful prosecution is more likely. Similarly, if a suspect considered to be a pillar of the community is suspected of one crime it may be put aside. However, if there are a multitude of offences confirmed to be caused by the same individual, public perception changes. Paedophiles may generate a large number of cases. In one such case, over seventy charges were prosecuted involving multiple victims.

Although not supplying absolute proof of inclusion, the SOI system should eliminate the innocent and provide additional investigative information on other crimes and individuals. The application to casework should not be limited to sexual offence cases. Arson, homicide and drug trafficking investigations should also have a direct application to such an intelligence database.
Future Applications

As the need for information exchange grows, so does the requirement to centralise or nationalise that information. Particularly in the justice system, crime and criminals have no respect for jurisdictional boundaries. Davies (1991) has noted that in the United Kingdom the advent of DNA profiling has drastically changed the quality of evidence in sexual offence crimes. There has been an increase in the number of cases attributed to certain offenders and an acceptance of the recidivist nature of a significant proportion of sexual criminals.

Another avenue to providing evidence of serial offences or offenders has been developed in both the USA (the Federal Bureau of Investigation at Quantico) and in the United Kingdom (by the Metropolitan Police Forensic Science Laboratory and University of Surrey). These processes are known respectively as the Violent Criminal Apprehension Program (VICAP) and Offender Profiling and are essentially based on behavioural factors leading to the acquisition of knowledge about the offender (Hazelwood & Burgess 1987; Canter 1989; Canter & Heritage 1990; Davies, 1991). The offender profile is a weighted list of offender characteristics defined, at least in the United Kingdom model, by indicators of the extent and constituents of his criminal career, the aggression displayed, the amount and type of the language used and the nature of the sexual component.

VICAP is essentially a data-capture system and the information gained is used in offender profiling or Criminal Investigative Analysis (CIA). Based on the premise that the behaviour exhibited by an offender at the scene of a crime reflects personality, the CIA process is designed to provide a number of services to investigators including the provision of a psychological profile of the offender.

At present, offender behavioural profiling has little evidential application but may be useful as an investigative tool when little else is available. However, a combination of both these techniques and the SOI system should be a significant investigative aid. Victoria Police are currently intending to establish a Victorian Centre for the Analysis of Violent Crime with a view to eventually establishing a National Centre for the Analysis of Violent Crime (NCAVC). Incorporated into this proposal should be the Violent Offender Integrated Computer Evaluation system (VOICE).

The VOICE proposal will integrate all aspects of intelligence information. Detectives in the field will be equipped with notebook computers that have software covering the types of questions asked in both the VICAP and SOI system programs. Once obtained, the information will be electronically transferred to a central computer and disseminated through local area networks (LAN) to various bodies. The crime squads (such as the Rape Squad) will have access to the vast majority of the prepared MO information. Searches can be initiated to cover specifically targeted offences. The SFSL would have access to the information presently contained in the RECSO. Additional information is processed as at present (for example, RESSE, DNA res). Naturally, barriers as to access to parts of the information will be enforced via login restriction. A scientist does not need to have access to all the details of an investigation just as a detective should not be expected to interpret complex scientific results or personal background material.

Since DNA profiling is part of the VOICE proposal, if a national system is to be established then a uniform core of DNA profiling systems needs to be investigated. The SFSL and the Forensic Science Laboratory in Adelaide have collaborated to obtain a research grant from the newly created National Institute of Forensic Science. As a result of
this research, recommendations will be made and, if accepted, provide a mechanism for a national database.

In order to achieve a truly national system, legislative differences between the states will need to be addressed. One area of reform is in the ability to obtain comparative samples from suspects. The *Crimes (Blood samples) Act 1989 (Vic.)* has addressed this need in part. It is currently being proposed that an amendment to the Act incorporates the ability to obtain a blood sample from a suspect when it is believed blood or other biological material could have been expected to have been transferred from the victim to the suspect. Examples of such a transfer could be when either a young child or menstruating adult is sexually penetrated, or in the case of serious physical violence causing serious injury or death.

**Benefits to the Community**

While sex offences make up a small proportion of total offences, their impact is significant. In particular, the perceived public fear when a serial offender is highlighted in the media warrants further attention.

- Serial offences or offenders may be discovered as a matter of course as this system will provide information on cases that had not been previously targeted as serial offences.

- Victims (generally women and children) may recover more rapidly following the detection of the offender. Where serial rapists are involved, a greater number of crimes may be revealed than was first considered, thus helping more victims to cope with rehabilitation. In the case of 'Mr. Stinky', due to the now defunct 6-hour rule (*Crimes Act 1958 (Vic.),* section 460) a large number of sex offences attributed to him were not prosecuted. Although the victims have been assured by the investigating police that he was the offender, the lack of conviction or guilty plea to their particular crime has not enhanced their recovery (MacDonald, G. 1989, VOCAL, personal communication).

- Investigations may be geared toward a specific number of crimes as some offences may be eliminated. Police resources can be reallocated and a monetary saving in overtime costs observed.

- Suspects will be eliminated rapidly, thus allowing them to resume a normal life with no adverse consequences. In the collection and retention of any information on individuals, it is expected that the checks and balances in operation ensure confidentiality. It is not the function of the SOI system or indeed legislation to maintain open files on individuals once excluded or whose blood had been originally obtained for elimination purposes.

- That scientists will present up-to-date relevant interpretations to scenarios put by barristers in court. At present, some areas of the scientific literature that are often explored in court are vague and provide little insight to the court in their deliberations.
It is estimated that since DNA profiling was first introduced into routine casework, 25 per cent of all cases submitted gave no result for the test sample. Of the 75 per cent remaining, 50 per cent of the suspects were eliminated. It was also observed that the frequency of guilty pleas or changes to lines of defence has significantly increased in those presented cases for trial (Roberts, H. 1992, State Forensic Science Laboratory, Victoria, pers. comm.). Although the incidence of obtaining results by conventional testing has in the past been low, cases where a result was obtained have been reflected in the successful elimination of a large number of suspects. In all, at least two serial rapists in Victoria in recent times have pleaded guilty to multiple offences when confronted with overwhelming scientific evidence. There would, therefore, be an additional cost-saving in the reduction of court time and/or appearances.

Summary

On examining any intelligence system designed to provide police with information about similar cases or serial offenders, the simple question should always be asked: Do we need intelligence in this area of investigation?

In the case of sexual offence investigation, the recidivism of sex offenders has been the subject of many academic research papers. Most recently, Broadhurst and Maller (1992) studied sex offenders in the Western Australian prison population over the period of 1975–1987. For non-Aboriginal prisoners, the failure rate analysis (probability of re-incarceration) for any offence was 0.35. Estimates of committing further offences of violence, including further sex offences, were 0.21. It was further implied that prior record, age and race were crucial factors, but little evidence of the specialist sex offender were detected.

It is claimed that in the USA, one in three women will be victims of rape or attempted rape during their lifetime (Russell 1982). Although no lifetime rates are available for Australia, rates of sexual victimisation are considered to be higher than for England and Wales (Walker, Collier & Tarling 1990). Since the apparent reporting to relevant authorities is low, fears of crime, whether statistically meaningful or perceived, should never be ignored.

The work of Blumstein, Cohen, Roth and Visher (1986) and Blumstein, Cohen and Farrington (1988), demonstrates that only a few offenders account for the majority of crime, especially serious crime. Furby, Weinrott and Blackshaw (1989) found that the longer the follow-up in examining sex offenders the greater the chance of re-offending. A ten-year follow-up period from such studies was therefore recommended. Burgoyne (1979) found that of 115 rape offenders followed for five years, 58 per cent had at least one subsequent conviction for any offence, while 31 per cent had been convicted of violent offences. A study of adult sex offenders in the USA. (Romero & Williams 1985) found that over half were re-arrested within ten years for any offence and 11 per cent for further sex offences. It was concluded that:

Individuals with a history of sex offences and sexual assaulters with a history of any violent offences are more likely to recidivism over a long time span than individuals with one sex offence (Romero & Williams 1985, p. 63).
Further studies have been published with similar conclusions (Rice, Harris & Quinsey 1989; Grumfeld & Noveik 1986; Van der Werff 1989). It is suggested that for repeat offenders 'generalists' rather than 'specialists' exist. Findings indicate that recidivists:

- show a pattern of aggressive behaviour—suggesting that aggression rather than perversion is the more salient characteristic of some sex offenders (Broadhurst & Maller 1992, p. 72).

From these studies it appears that the chance of re-offending is a real problem to the community. Therefore, systems such as described in this paper will play an important role in early detection given a sizeable database of blood samples from convicted sex offenders. In many states of the USA, and included in the proposed amendments to the Crimes (Blood Samples) Act 1989, is the requirement for convicted sex offenders considered likely to re-offend to provide a blood sample on release. Under the SOI system described, all cases will be screened for semen and other biological material and a profile placed for each on the database. If the individual re-offends, then the profile from both the semen and supplied blood sample will be recorded as a 'hit'. The investigating detective can then narrow the inquiry and, if warranted, effect an arrest.

It is this process that provides a proactive team-orientated approach to the investigation of sexual offences. The community gains from such a rapid response since the victim observes a degree of finality to one phase of the rehabilitation process. Court times may be reduced with more guilty pleas and the police can be re-deployed to other investigations.

At the very least, a change in direction for the investigation by the inclusion or exclusion of cases may lead to a breakthrough. To some members of the community, if a system so described leads to the arrest of one serial sexual offender or re-offender then the system has proved its worth.

Although consisting of both a manual and computer system at present, it is hoped that, following the introduction of the VOICE proposal, a more rapid system of obtaining data for searching purposes (generally MO information) will be available. When linked to a national database via the NCAVC proposal—which includes MO, behavioural profiling and DNA profiling—a powerful investigative tool will be available to all jurisdictions. Collaborative studies between different States on the standardisation of DNA profiling system (National Institute of Forensic Science Research Project 1992) have begun this national approach.

**Conclusion**

In conclusion, the SOI system will provide investigators with a new proactive approach in addition to established MO principles. It relies on a coordinated team approach and will aid, not replace, the normal investigative techniques employed in modern police forces.

The SOI system will have proportionally increased impact once the database increases in size. This will improve the chances for a victim of having either the offender identified or having additional victims identified from whom mutual support may be gained. Simply put, the greater the incidence of reporting sexual offences, the greater the database, the greater the chance of detection.
References


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