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# Solvability Factors of Homicide in Australia: An Exploratory Analysis

Jenny Mouzos and Damon Muller

*Over the last few years the nexus between criminological research and law-enforcement practice has been strengthened through the increased cooperation of police and researchers working towards common goals. The Australian Institute of Criminology, through its National Homicide Monitoring Program, continues to provide police, policy-makers and the public with timely research on homicide and its subsets. The present paper follows this tradition by outlining the latest research on homicide, but it also introduces another element to research: the view of the practitioner. This study examines the factors that differentiate solved and unsolved homicides in Australia, and includes the perspectives of homicide investigators in determining which factors are important in solving a given homicide.*

*In brief, the study found that unsolved homicides were more likely than solved homicides to occur in the course of other crime and at a location other than a residential premise. The victims of unsolved homicides were more likely to be killed with a firearm, and were likely to be aged 30 years or older.*

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Director

One of the issues that is often overlooked when discussing homicide is the efficacy of the police in identifying and charging an offender. Advances in technology such as DNA typing (Weedn & Hicks 1998), and innovations such as Cold Case Squads (Poole & Jurovics 1993; Regini 1997) are helping reduce the number of homicides which remain unsolved. However, there is little valid research about what makes a particular homicide more or less likely to be solved, and most of what is believed has not been verified in any way. While the insight of experienced homicide investigators will always be important for providing direction to a homicide investigation, research can also play an important role in informing practice.

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## Review of the Literature

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There is considerable concern, primarily in the public arena, about serious violent crimes such as homicide, but little attention is paid to the ability of police to solve these crimes. Evidence from the National Homicide Monitoring Program suggests that the percentage of homicides that remain unsolved in Australia has remained relatively stable at about 12 per cent over the years. However in the United States, various authors agree that in the last two decades the homicide clearance rate has decreased substantially (Riedel & Rinehart 1996; Wellford & Cronin 1999, 2000).<sup>1</sup> Gilbert (1983) reports that investigators are generally of the opinion that the increase in stranger homicides in the United States, crimes which are generally considered more difficult to solve, is at least partly responsible for the decreasing clearance rate. Wellford and Cronin (2000) add that decreases in police resources and the decrease in the likelihood of

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bystanders and witnesses to provide information, particularly in urban areas, also contributes to the increase in unsolved homicides.

Some years ago, Keppel and Weis (1994) observed that there was no empirical research on solvability factors relevant to homicide investigations. Since that time, little has changed (Wellford & Cronin 2000). Keppel and Weis point out that while homicide itself has been the subject of much research, the process of investigating homicide has not. Much of what is treated as canon by investigators is generally anecdotal information passed down by word-of-mouth. Furthermore, textbooks devoted to the subject primarily rely on the subjective experience of the author. The dearth of substantiated knowledge is not surprising, as police investigation is an area in which criminologists and other academics have traditionally shown little interest. However, with police organisations becoming increasingly open to assistance from outside experts, this is an area which could benefit from attention.

One approach that various researchers have taken to investigate this issue is to do statistical analyses of incident variables to see how solved and unsolved crimes differ. Wellford and Cronin (1999), for example, identified 51 characteristics of homicide events that affected clearance rates. Of these factors, 14 were not associated with police practices. The remaining factors were largely related to:

- resourcing (such as the number of detectives on the case, the number of detectives present at the autopsy, and the time it took the detectives to arrive on the scene); and
- quality of—and access to—information (information from witnesses and informants, and computer checks).

Some of these issues have already been taken up in guidelines to assist investigators (Technical Working Group on Crime Scene Investigation 2000). This working group observes that many of the characteristics of the crime itself

have little or no influence on clearance rates. It concludes that police policies and procedures can have a substantial effect on clearance rates. In contrast, Reidel and Rinehart (1996) conclude that the main differentiating factor between solved and unsolved homicides in Chicago was whether or not the homicide was committed in the course of another crime. They contend that many of the other factors (such as age of the victim) disappear when the issue of other crime is taken into consideration. Although, obviously, it is impossible to determine the victim–offender relationship in unsolved crimes, it seems reasonable to suggest that many of the homicides that occur in the course of another crime involve strangers.

Taking a slightly different approach, Keppel and Weis (1994) looked at how the distances between important locations in the crime (such as disposal site, point of contact between the victim and offender) and the times between stages of the crime influence clearances. They conclude that having information about time and location issues increases the chance of the crime being solved. For example, they state that knowing the site at which a murder occurred will be of more use to the investigation than the site at which the body was dumped (if different). However, while Keppel and Weis argue that their findings have implications for the allocation of resources in homicide investigations, they have little to offer to assist the process of investigation.

It must be noted that all of the aforementioned research is from the United States. While differences certainly exist between the type and characteristics of Australian and US homicides and the form of homicide investigations (and often between jurisdictions within Australia), insights garnered from overseas research should still be of interest to Australian investigators. To the knowledge of the authors, no study has ever looked in depth at the investigation of Australian homicides.

### *Aims of the Study*

The aims of the current study are to examine the factors that differentiate solved and unsolved homicides in Australia. While the analysis is limited by the types of variables routinely collected in the National Homicide Monitoring Program, it was also considered essential to obtain the insights of experienced homicide investigators. Hence, the perspectives of police homicide investigators were also canvassed in order to determine what they consider to be important factors in solving a given homicide. Such information is considered to be important for informing future investigative practices and broadening our understanding of the various subsets of homicide in Australia.

## Methodology

### *Definition of a Solved Homicide*

For the purposes of this study, a homicide is recorded as “solved” when an offender has been arrested and charged, or the homicide was a murder–suicide. This definition does not take into account the outcome of the judicial process, or whether the alleged offender is consequently acquitted or convicted.

### *Data Sources*

The exploration of solvability factors in homicide in Australia will be based on two main sources:

- National Homicide Monitoring Program data; and
- questionnaires completed by police detectives and officers responsible for the investigation of homicide in Australia.

### *National Homicide Monitoring Program Data*

The National Homicide Monitoring Program (NHMP) is responsible for the annual collection of data on all homicides (solved and unsolved) coming to the attention of police throughout Australia. Established in 1990, this program routinely collects data on some 77 variables relating to each incident of homicide, including data relating to the victim and to the offender (where one has been identified). These data come from

police and coronial records across Australia, and are supplemented where necessary with information provided directly by police in specific homicide investigations.

A total of 3,450 homicide incidents were recorded for the period 1 July 1989 to 30 June 2000, involving 3,723 victims and 3,783 offenders (where one has been identified by police). At the time of this report, there was a total of 430 homicides recorded in the NHMP database as unsolved, where an offender had yet to be identified by police (11.5%). The comparative analysis will focus on these 430 unsolved homicides and the remaining 3,292 solved homicides (one case with insufficient details has been excluded).

#### *Questionnaire Responses*

In addition to the analysis of NHMP data, it was also deemed important to obtain the perspectives of homicide investigators as to what factors they considered important in solving any given homicide. The questionnaire<sup>2</sup> consisted of five questions which allowed for open-ended responses, with the aim of eliciting as much information as possible. This questionnaire was forwarded to each "homicide squad" or major crime investigation branch in Victoria, South Australia, Western Australia and Queensland in May 2001. A total of 11 completed questionnaires were received, and responses analysed,<sup>3</sup> from police ranging in rank from Detective Senior Constable to Detective Superintendent.

The questionnaire sought responses to the following:

1. Please identify which internal organisational factors you consider to be most important in solving homicides. Explain why each factor is important.
2. Please identify which crime scene factors you consider to be most important in solving homicides. Explain why each factor is important.
3. Please identify which witness factors you consider to be most important in solving homicides. Explain why each factor is important.
4. Please identify which other factors you consider to be most

important in solving homicides. Explain why each factor is important.

5. Please identify which factors you consider to be the major impediments in solving homicides.

#### **Comparative Analysis of Solved and Unsolved Homicides**

In order to examine what factors differentiate solved and unsolved homicides in Australia, a comparative analysis of incident and victim characteristics was undertaken. The results revealed that there were a number of significant factors found to be more common in unsolved homicides when compared to homicides where an offender had been identified and charged (Table 1). These significant differences will be discussed in turn.

#### *Factors Associated with the Homicide Incident*

One of the most significant factors found to differentiate solved and unsolved homicides was whether the incident occurred during the commission of another offence, such as a robbery or a break and enter. The comparative analysis indicates that unsolved homicides were significantly more likely than solved homicides to occur during the course of another crime (22.6% and 11.9% respectively).

Although the majority of homicides, regardless of their clear-up status, were more likely to occur between 6pm and 6am, the current study found that unsolved homicides were significantly less likely than solved homicides to occur during these hours (54.7% versus 62.8%). Similarly, it was found that unsolved homicides were significantly more likely than solved homicides to involve single victims as opposed to multiple victims. Only 6.7 per cent of unsolved homicides (n=29) involved multiple victims, compared to 12.5 per cent of solved homicides (n=412).

Previous research suggests that the majority of homicides in Australia occur in residential

premises (Mouzos 2001). However, the comparative analysis suggests otherwise for unsolved homicides. The majority of unsolved homicides occurred in a location other than a residential premise (56.9%). The majority of solved homicides occurred in a residential premise (61.9%) (Cramer's V statistic of 0.12 suggests a moderate association).

#### *Factors Associated with the Victim*

The comparative analysis revealed a number of victim characteristics that differentiated solved and unsolved homicides. Gender of the victim was not a significant factor. The distribution of male and female victims did not differ based on whether the homicide was solved or unsolved. Males outnumbered females as victims of homicide, following similar patterns of homicide in general (63.2% male; 36.8% female—see Mouzos 2000, 2001).

Age, however, was a significant factor found to differentiate solved and unsolved homicides in Australia. Unsolved homicides were significantly more likely than solved homicides to involve victims aged 30 years and older (66.3% and 57.9% respectively). Riedel and Rinehart (1996) noted similar findings in their United States-based study.

Differences were also found according to the racial appearance of the victim. Homicides were significantly more likely to be solved when they involved an Indigenous victim. During the 11-year period under analysis there were only 15 unsolved homicides where the victim was Indigenous, compared to 449 Indigenous victims of solved homicides.

Interestingly, the labour force status of the victim was also a factor that differentiated solved and unsolved homicides. The results indicated that victims of unsolved homicides were significantly more likely than the victims of solved homicides to be in the labour force at the time of the homicide (36.1% versus 25.8%). No differences, however, were found based on the marital status of the victim. Irrespective of whether the homicide was

solved or not, the majority of victims in the current study were recorded as either in a current or former relationship (married or de facto), divorced or widowed (Table 1).

Factors such as the involvement of alcohol or drugs on the part of the victim were also examined. Findings suggest that victims of unsolved homicides are significantly less likely than victims of solved homicides to have consumed alcohol prior to the incident (14.4% versus 33.2%—Cramer’s V statistic of 0.13 suggests a moderate

association) or to have used illicit drugs (18.6% versus 30.6%).

The last factor found to differentiate solved and unsolved homicides was the type of weapon used to kill the victim. Knives and other sharp instruments were significantly less likely to be used in unsolved homicides compared to solved homicides (19.5% versus 32.6%), whereas firearms were found to be used more frequently in unsolved homicides compared to solved homicides (25.4% and 19.9% respectively). There were no recorded differences in the

proportion of victims fatally assaulted with hands/feet.

In brief, the results of the comparative analysis suggest that there are a number of factors that differentiate solved and unsolved homicides in Australia. The differential incident and victim factors of unsolved homicides were:

- occurred in the course of another crime;
- single victim incident;
- occurred in a location other than a residential premise;
- victim aged 30 years or older;
- non-Indigenous victim;
- victim in the labour force at the time of the incident;
- victim less likely to have consumed alcohol or used illicit drugs; and
- a firearm was used to commit the homicide.

From the entire sample of solved homicides, the above incident and victim characteristics were selected in order to identify likely characteristics of the offenders of the unsolved homicides. The analysis revealed that the offenders in these matched cases (n=67) were more likely to:

- be male (92.5%);
- be aged between 18 and 34 years (73.1%);
- be non-Indigenous (83.6%);
- not be in the labour force (67.2%);
- have never been married (82.1%);
- have a previous criminal history (49.3%);
- have been unknown to the victim (73.1%); and
- have committed the offence in concert with other offenders (68.7%).

**Table 1: Comparison between unsolved and solved homicides, 1989–1990 to 1999–2000**

Factors	Unsolved homicides		Solved homicides	
	No.	%	No.	%
<i>Incident characteristics</i>				
Occurred in the course of other crime				
Yes	97	**22.56	392	11.91
No	333	77.44	2,900	88.09
Time of the homicide				
6pm to 6am	235	**54.65	2,067	62.79
6am to 6pm	195	45.35	1,225	37.21
Day of the week				
Weekdays	301	70.00	2,168	65.89
Weekends	129	30.00	1,124	34.14
Number of victims				
Single victim	401	**93.26	2,880	87.48
Multiple victims	29	6.74	412	12.52
Location of the homicide				
Residential premise	185	**43.02	2,038	61.91
Other location	245	56.98	1,254	38.09
<i>Victim characteristics</i>				
Gender				
Male	275	63.95	2,062	62.64
Female	155	36.05	1,230	37.36
Age				
Less than 30 years	145	**33.72	1,387	42.13
30 years and older	285	66.28	1,905	57.87
Racial appearance				
Indigenous victim	15	**3.49	449	13.64
Non-Indigenous victim	415	96.51	2,843	86.36
Labour force status				
Victim in the labour force	155	**36.05	850	25.82
Victim not in the labour force	275	63.95	2,442	74.18
Marital status				
Never married	163	37.91	1,206	36.63
Ever married	267	62.09	2,086	63.37
Under the influence of alcohol				
Yes	62	**14.42	1,092	33.17
No	368	85.58	2,200	66.83
Under the influence of illicit drugs				
Yes	80	**18.60	1,006	30.56
No	350	81.40	2,286	69.44
Type of weapon involved				
Knife and other sharp instrument	84	**19.53	1,072	32.56
Firearm	109	**25.35	654	19.87
Assaultive force (hands/feet)	106	24.65	803	24.39
Other weapon	131	**31.47	763	23.18
Total	430	100.00	3,292	100.00

\*\* p<0.001 chi-square test of significance

Source: Australian Institute of Criminology, National Homicide Monitoring Program 1989–2000 [computer file]

### Factors Important in Solving Homicide: The Homicide Investigators’ Perspective

The completed questionnaires were analysed in order to identify the major themes that homicide investigators considered to be important in order to solve a homicide. This qualitative analysis revealed a number of commonalities in the factors considered important. It should be emphasised that the discussion

which follows is based on the major themes identified in the questionnaires, and may not necessarily reflect the views expressed in every questionnaire. While there were no major divergences in views, a number of minor divergences were identified and these are highlighted.

#### *Internal Organisational Factors*

The most noteworthy factor mentioned by all respondents was the availability of sufficient resources. For example:

- ample time to devote to the investigation (as one detective pointed out “the golden rule: ‘one investigation at a time’”);
- sufficient numbers of experienced detectives to assign to all of the cases (a team of professionals);
- overtime;
- support staff;
- analysts;
- cooperation; and
- effective communication.

Also emphasised was the importance of the allocation of an experienced detective to a case as early as possible (“forming the nucleus of the investigative team or taskforce”) and the ability of the detectives to promptly attend the scene (“necessary for optimum crime scene management”) and to speak to witnesses.

#### *Crime Scene Factors*

One of the most important crime scene factors was the necessity of an experienced detective to rapidly secure the primary scene, and any other scenes. This facilitates the preservation and collection of evidence, and examination of the body *in situ* (“personal attendance at a crime scene is the most beneficial mechanism for obtaining a full appreciation of the vicinity and surrounds”). It also minimises the potential threat of contamination by limiting the number of people who enter the crime scene. Some respondents emphasised that locating the body was not essential for the homicide to be solved, while others thought that it was “the most significant factor in solving a homicide”.

Also considered important was the need for forensic specialists to attend. With regard to the collection of evidence, one detective stated that “it is better to have it [the evidence] and not need it, than need it and not have it”. Another identified factor was the construction of a time line for both the victim and the offender and a comparison of where overlaps occur. Also considered important in terms of the crime scene was the timely location and segregation of witnesses in order to prevent cross-contamination through witnesses discussing their evidence.

#### *Witness Factors*

The most important witness factor was the actual presence of witnesses. As one detective pointed out “the absence of witnesses severely impedes the investigation”. Consistently across respondents was the idea of “getting it right the first time”. This referred to obtaining a thorough, well-documented statement by an experienced detective containing all the relevant facts, negating the need to interview witnesses on multiple occasions. Door knocks were considered useful in eliciting information, however in some cases this time-consuming and labour-intensive exercise did not always bear fruit. Also considered important were victimology, questioning family and friends, and identifying eyewitnesses.

It is interesting to note that some respondents considered the location where the witness was interviewed to be important (lack of distractions and so on), while others noted that it was not a major factor in the quality of information obtained. One detective indicated that the location of the interview:

...may have a positive and negative effect on their [the witness's] statement. An interview conducted at the scene will have the benefit of time and relevance...conversely, they may be distressed by the proximity of the crime or not wish to be seen discussing the event with police in public.

#### *Other Factors*

Other factors identified as important in solving homicides included the use of technology such as telephone intercepts, listening devices and polygraphs. Respondents considered CrimeStoppers (a publicised anonymous hotline for providing information to police) extremely helpful in some cases, especially when the segment generated a lot of interest. Some respondents did caution that such attention may “result in an overload of time-consuming and unnecessary enquiries”, although some of the information received could turn out to be of significant value. The ability to interrogate police intelligence systems was raised, as was the importance of liaising with other agencies (“inter-agency involvement and cooperation is critical”), the use of covert police operatives, and informants.

#### *Major impediments*

One observation was that:

...all murders are solvable if there was sufficient time to work solely on one murder at a time and with sufficient resources. Many avenues of enquiry never get done due to a fresh homicide being committed.

Lack of resources, time and suitably qualified staff were recurring themes throughout some of the responses. Other impediments identified included witness reluctance (especially in relation to immigrant communities), poor information flow, organisational structure, the time taken for forensic examinations, and lack of analytical support.

A few detectives indicated that there were a number of legislative impediments relative to the investigation of homicide. One detective mentioned the need to change the legal caution to:

...a system similar to the English caution whereby an offender can maintain their silence but if they intend to use a defence at a later stage they should speak to the police about it at that time.

Changes to other legal requirements concerning the provision of DNA/blood samples were also mentioned as “significant impediments to investigators”.

## Concluding Comments

There appear to be two main issues with regard to the solvability of homicides. The first is dependent on the crime itself. For example, if the crime was committed by a stranger and the motive was unknown (therefore, no obvious suspects), it will be inherently more difficult to solve. While the present study has identified subtle patterns differentiating solved and unsolved homicides (although the differences were small in some cases<sup>4</sup>), these patterns suggest that there is not only one explanation for these homicides. The other issue concerns police responses to the crime, which include issues such as having competent, experienced detectives, being able to collect and analyse the evidence, and having the time to work the case. These factors should increase the chance of solving any given homicide, but it should be cautioned that there is no magic formula for solving all homicides. A seemingly impossible homicide can be quickly solved on the information of one anonymous call, something that is generally impossible for police, criminologists or policy-makers to influence. Other difficult cases can be solved by "tried and proven methods", careful examination of all the evidence, and a great deal of patience and tenacity.

What seems self-evident, however, is that all homicides are potentially solvable, but that some will require a disproportionate amount of time and effort. Research highlighting those factors common in unsolved homicides, along with the experience of a competent detective, should help in identifying those cases which will be most difficult to solve. It would seem that allocating sufficient resources to these difficult cases as promptly as possible should substantially increase the chances of them being solved. This therefore requires that there are sufficient resources to allocate for both the

straightforward and the more difficult homicides. Experience has shown that this is possible (for example, the Lorimer Taskforce that worked on the shooting of two police officers in Victoria managed to charge two suspects after many months of painstaking investigation), but it requires sufficient motivation on behalf of both governments and police to devote the resources to seeing the case to its conclusion.

## Notes

- 1 According to the Federal Bureau of Investigation's Uniform Crime Reports, the United States homicide clearance rate has started to increase again, up to a total of 69 per cent in 1999.
- 2 For further information on the questionnaire, please contact the principal author.
- 3 South Australia forwarded a combined response from four completed questionnaires and Queensland provided general comments in response to items in the questionnaire.
- 4 While the Cramer's V statistic showed relatively weak associations for some cases, it is important to note that because we are dealing with the whole population, and not just a sample, any differences observed are "real" and not a function of errors related to drawing a sample.

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## References

- Gilbert, J.N. 1983, "A study of the increased rate of unsolved criminal homicide in San Diego, California and its relationship to police investigative effectiveness", *American Journal of Police*, vol. 2, no. 2, pp. 149-66.

- Keppel, R.D. & Weis, J.G. 1994, "Time and distance as solvability factors in murder cases", *Journal of Forensic Sciences*, vol. 39, no. 2, pp. 286-401.
- Mouzos, J. 2000, *Homicidal Encounters: A Study of Homicide in Australia 1989-1999*, Research and Public Policy Series, no. 28, Australian Institute of Criminology, Canberra.
- 2001, "Homicide in Australia, 1999-2000", *Trends and Issues in Crime and Criminal Justice*, no. 187, Australian Institute of Criminology, Canberra.
- Poole, H. & Jurovics, S. 1993, "MUST: A Team for unsolved homicides", *FBI Law Enforcement Bulletin*, March, pp. 1-4.
- Regini, C.L. 1997, "The cold case concept", *FBI Law Enforcement Bulletin*, August, pp. 1-6.
- Riedel, M. & Rinehart, T.A. 1996, "Murder clearances and missing data", *Journal of Crime and Justice*, vol. 14, no. 2, pp. 83-102.
- Technical Working Group on Crime Scene Investigation 2000, *Crime Scene Investigation: A Guide for Law Enforcement*, National Institute of Justice, Washington DC.
- Weedn, V.W. & Hicks, J.W. 1998, *The Unrealized Potential of DNA Testing*, National Institute of Justice Research in Action, United States Department of Justice.
- Wellford, C. & Cronin, J. 1999, *An Analysis of Variables Affecting the Clearance of Homicides: A Multi-State Study*, Justice Research and Statistics Association, Washington DC.
- 2000, "Clearing up homicide clearance rates", *National Institute of Justice Journal*, April, pp. 3-7.

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