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Brisbane Australia

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[Carpenter, Belinda](#), Bond, Christine, [Tait, Gordon](#), [Wilson, Moira](#), & White, Kris

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Who leaves suicide notes? An exploration of victim characteristics and suicide method of completed suicides in Queensland.

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**Cover Letter**

**Associate Professor Gordon Tait,  
Faculty of Education,  
Queensland University of Technology,  
Brisbane, Queensland  
Australia**

**6/6/2013**

**Dear Editor,**

**We are submitting the article, ‘Who leaves suicide notes? An exploration of victim characteristics and suicide method of completed suicides in Queensland’, for publication in Archives of Suicide Research.**

**All the authors--Dr Belinda Carpenter, Dr Christine Bond, Dr Gordon Tait, Ms Moira Wilson, and Mr Kris White—have agreed to the content and submission of this paper.**

**Yours faithfully,**

**Dr Gordon Tait**

**Who leaves suicide notes?  
An exploration of victim characteristics and suicide method of completed  
suicides in Queensland.**

**(Title for Running Head: 'Who leaves Suicide Notes?')**

**Dr Belinda Carpenter,  
Faculty of Law, QUT, Qld, Australia  
Dr Christine Bond,  
School of Criminology and Criminal Justice, Griffith University, Qld, Australia  
Dr Gordon Tait,  
Faculty of Education, QUT, Qld, Australia  
Ms Moira Wilson,  
School of Justice, Faculty of Law, QUT, Qld, Australia  
Mr Kris White,  
School of Justice, Faculty of Law, QUT, Qld, Australia**

**Contact Author: Associate Professor Gordon Tait  
([g.tait@qut.edu.au](mailto:g.tait@qut.edu.au) Tel: 07 3138 3499, Fax 07 3138 8265)**

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**Who leaves suicide notes?**  
**An exploration of victim characteristics and suicide method of completed suicides in Queensland.**

**1. Abstract**

The objective of this study is to address the question: are those who leave suicide notes representative of the larger population of those who commit suicide? The method involves an analysis of a full population of suicides by residents of the state of Queensland, Australia for the full year of 2004, with the information drawn from Coronial files. Our overall results suggest that, and in support of previous research, the population who leaves suicide notes are remarkably similar to those who do not. Differences are identified in four areas: first, and in contrast to prior research, females are less likely to leave a suicide note; second, and in support of previous research, Aboriginal Australians are less likely to leave suicide notes; third, and in support of some previous research, those who use gas as a method of suicide are more likely to leave notes, while those who use a vehicle or a train are less likely to leave notes; finally, our findings lend support to research which finds that those with a diagnosed mental illness are less likely to leave notes. The discussion addresses some of the reasons as to why these disparities may have occurred, and continues the debate over the degree to which suicide notes give insight into suicide itself.

**2. Introduction.**

The purpose of this paper is to engage with the emerging literature on suicide notes, which unlike the research on suicide more generally, is an under-researched area both in Australia and internationally. While it appears that in the public imagination suicide notes are seen as a measure

of the intent to take your own life, research demonstrates that suicide notes are left in the minority of completed suicides (Koehler, 2007). Because of this, the usefulness of exploring suicide notes has been questioned, especially in terms of the applicability and generalisability of such research for the larger suicide population. This is reinforced by the contradictory results of the small amount of research which has explored the demographics of those who leave suicide notes (Callanan & Davis, 2009). While such research findings seem to be compounded by the small sample size of much of this research, it is also made more difficult by the bigger methodological issue of access to accurate data on suicide and the differing cultural contexts within which these explorations of suicide notes occur (Chavez-Hernandez, Paramo, Leenaars, & Leenaars, 2006; Demirel, Aker, Sayin, Condansayer, & Leenaars, 2008; Leenaars et al., 2010).

The central question in much of the research for which there is no clear answer is: Are certain groups of people more likely to leave suicide notes? This paper will explore this question through the demographic characteristics of age, gender, aboriginality and socio-economic status. However, aside from socio-demographic variables, this paper will also examine the context of the suicide, through the variables of mental illness and the mode of suicide. Incorporating detail on these issues will further enhance our ability to address the relationship between the suicide population more generally, and that sub-population which leaves suicide notes. This paper will address the literature relating to these issues by exploring our knowledge of suicide populations, research on note leavers and comparative research on suicide notes amongst the larger suicide population. It will also examine the statistics for 2004 Queensland suicides to determine whether the data gathered during this research supports previous findings. Finally, it will attempt to draw some conclusions regarding the relationship between suicide notes and suicide more generally.

### **3. Suicide and suicide notes: some conclusions from the literature**

### **3.1. Rates and Trends**

Each year worldwide it is estimated that just under 900 000 people die by suicide (World Health Organisation (WHO), 2004). In Australia, 2101 suicides were identified during 2005, or 1.6% of the total deaths for that year (Simon-Davies, 2011). However, the overall number of suicides in Australia has fallen from 2,720 in 1997 to 2,101 in 2005—a 30% decrease (Harrison, Abou Elnour, & Pointer, 2009). This decrease is also mirrored in the suicide rates for Queensland (Simon-Davies, 2011).

While suicide notes are typically seen as an indication of the severity of the suicide attempt, only a minority of completed suicides include suicide notes, with recent prior research identifying ranges of between 15-43% (Kuwabura et al., 2006), and 14-31% (Callanan & Davis, 2009). The generally agreed stable proportion of suicides with notes is between 25-30%, despite fluctuations in the actual suicide rate (Tewksbury, Suresh, & Holmes, 2010; Shiori et al 2005).

### **3.2 Victim Characteristics**

#### **3.2.1 Gender**

Extensive research on the issue of gender and suicide has shown that men have consistently higher suicide rates than women (Simon-Davies, 2011). While the levels of male to female suicides vary between countries, most OECD countries have a ratio in excess of 2.5:1. In terms of rates per 100 000, the United States (18.4:4.7 or 3.9:1), the United Kingdom (17.5:5.2 or 3.3:1) and Australia (14.9:4.5 or 3.3:1) have rates that are even higher (Simon-Davies, 2011) and increasing (Hawton & van Heeringen, 2009).

With regard to the issue of suicide notes, some research reports that women are more likely as a group to leave suicide notes, although this intersects with age, marital status and method (Heim &

Lester, 1990; Ho, Yip, Chiu, & Halliday, 1998; Kuwabara et al., 2006) with young married women who use non-lethal methods the most likely to leave a suicide note (Heim & Lester, 1990; Ho et al., 1998; Kuwabara et al., 2006). Similarly, some research reports that men are less likely to leave notes, despite the fact that they are much more likely to commit suicide (Kuwabara et al., 2006). When men leave notes, this has been statistically correlated with age and mode of suicide, with elderly men using a firearm 5% more likely to leave a note (Tewksbury, Suresh and Holmes 2010). When studies have found men more likely to leave a note, this is generally due to small sample size (Bhatia, Verma, & Murty, 2006); or selective sampling (Salib, Cawley, & Healy, 2002).

### **3.2.2 Age**

Suicide is a major cause of death for the young, with statistics showing up to 20% of all male deaths and 28% of female deaths among adolescents in the industrialised world are caused by suicide (Leenaars, De Wilde, Wenckstern, & Kral, 2001). This places suicide as one of the top three causes of death for adolescents. Like suicide rates more generally, young males are 2.6 times more likely to commit suicide than young females (Wasserman, Cheng, & Jiang, 2005). Research also suggests that the suicide rates among men increase with age, in contrast to the rates of suicide among women (Stack, 2000a, 2000b). Graycar (2000, p. 4) notes that elderly men have a disproportionately high overall level of suicide. Although there are clear age differences in suicide rates, research is mixed regarding age differences in suicide notes, with some studies finding that young people are more likely to leave notes, while others find that the elderly are more likely (Callanan & Davis, 2009; Heim & Lester, 1990; Ho et al., 1998; Kuwabara et al., 2006).

### **3.2.3 Aboriginality**

The Aboriginal community of Australia faces many of the same problems that confront Indigenous communities in New Zealand, Canada and the USA, including issues of violence, substance abuse,

poverty and marginalisation (Morrissey, 2003). High rates of suicide in the Indigenous population is a signal illustration of the severity of these concerns (Tatz, 2005). While available Aboriginal suicide figures are likely to be significant underestimations, official statistics still place the rates of suicide at 2.5 times higher than that of other Australians (Simon-Davies, 2011). In Queensland, this rate stands at twice the non-Indigenous rate (Harrison et al., 2009). When age is factored into these statistics—and in contrast to trends in non-Aboriginal suicide—suicide is more pronounced among young Aborigines. With specific regard to suicide notes, previous research by Carpenter and Tait (2009) on Queensland coronial files found that Indigenous Australians are much less likely to leave suicide notes than the non-Indigenous population.

#### **3.2.4 Class**

There is considerably less literature on socio-economic status and suicide rates than for the other demographic variables of interest in this study. Part of the reason for this may be to do with the lack of access to data on class for those who commit suicide, and the difficulty of determining class-based variables clearly and concisely. When socio-economic variables are analysed, rates of suicide are higher in the unemployed and manual occupational groups, and vary over time with rates of unemployment for young people (Hawton, Harriss, Hodder, Simkin, & Gunnell, 2001). Being in debt has also been linked with deliberate self harm (Qin, Agerbo, & Mortensen, 2003). Similarly, areas characterised by high rates of socio-economic deprivation have increased rates of suicide (Page et al 2006; Qin et al., 2003). Studies which analyse class and suicide notes have found that those with lower levels of education are less likely to leave a note (Kuwabura et al., 2006), while note leavers have been found to have higher vocabulary scores (Tewksbury et al., 2010).

### **3.3 Suicide Context**

### **3.3.1 Mental illness**

There is a strong correlation between suicide and a history of mental illness. According to Hawton and van Heeringen (2009), the vast number of psychological autopsies in developed countries have shown that 90% of people who kill themselves have a psychiatric disorder. Specifically, more than half the people who die by suicide have a current depressive disorder, and as a consequence, about 4% of depressed individuals will die by suicide, usually at their first attempt. A number of Australian studies have similarly shown that disproportionately large numbers of individuals, who have committed suicide have also had psychiatric treatment (Baume, Cantor, & McTaggart, 1998; Simon-Davies, 2011).

With regard to suicide notes, there seems to be some consensus that notes are significantly less likely to be left by those with a mental illness. Kuwabara et al (2006) found that individuals with psychiatric illnesses and/or a history of previous psychiatric disorders had a tendency to not leave a note. Similarly, Ho et al (1998) found that those who left notes had no previous psychiatric illnesses. This is also supported by Salib, Cawley and Healy (2002) who found in their 10 year study of elderly suicides that those who left notes were less likely to be known to psychiatric services and less likely to have had recent psychiatric treatment. In contrast, Callanan and Davis (2009) did not find any significant difference in terms of mental illness between those who left a note and those who did not.

### **3.3.2 Mode**

As Hawton and van Heeringen (2009) note, the method chosen for suicide is related to a range of issues including availability and cultural acceptability, and demographics, specifically age and gender. In the US, where guns are culturally acceptable and gun ownership is high, firearms are used in most suicides. In rural areas of many developing countries, where farming is a way of life,

ingestion of pesticides is the main method of suicide. In Australia, with the negative connotations between hanging and capital punishment disappearing from the social memory (DeLeo et al., 2000), and with a range of legislation in place to buy back guns and tighten gun ownership after the Port Arthur Massacre in 1996, suicide by hanging is now the dominant suicide method in Australia, increasing from 24.5% in 1995, to 42% by 2004 (Harrison et al., 2009).

With regard to suicide notes, the dominant method is not clear. There is some support that those who employ more lethal methods may be more likely to leave suicide notes (Tewksbury et al., 2010). For instance, Salib, Cawley and Healy (2002) found those committing suicide by the non-lethal method of drowning the least likely to leave a note in their 10 year study. In contrast, Kuwabara et al (2006) found a mixture of lethal and non-lethal methods in their research, with those more likely to leave notes committing suicide by carbon monoxide poisoning, hanging or sharp instruments, while Heim and Lester (1990) found that those who left notes were most likely to commit suicide through non-lethal means like poisoning. Outside of the lethal/non-lethal debate, Ho et al (1998) found that individuals who used suicide methods that required little preparation, such as jumping from a height, were less likely to leave a note.

### **3.4 Note leavers and the larger suicide population**

Callanan and Davis (2009) maintain that a thorough review of the literature since 1950 found only 13 studies that compared the demographics of those who left suicide notes with those who did not. This is distinct from that literature which explores the content of suicide notes in an attempt to offer an insight into the motivation for those who commit suicide (Matykiewicz, Duch and Pestian 2009; Leenaars et al 2003; Leenaars, Lester and Wenckstern 1999; Lester 1998; Lester and Linn 1998;; Leenaars 1992; Leenaars and Lester 1991). However, these two bodies of work are related in the research since such insight only has currency if the suicide note leaving population is

positioned as demographically similar to the larger suicide population. Currently, and as the previous discussion has suggested, there is a lack of clear consensus in the literature about the demographics of those who leave suicide notes. Not surprisingly, this discrepancy continues into the research which directly compares those who leave notes with those who do not.

According to Callanan and Davis (2009), no clear pattern in socio demographic differences can be discerned between those who leave suicide notes and those who do not. Part of the problem is due to the small sample sizes and thus the lack of multivariate analysis, as well as the different cultural contexts of the research. Their own analysis discovered only two findings of significance: those who left suicide notes were more likely to have lived alone and have made prior suicide threats. They conclude that there is little difference between those who leave suicide notes and those who do not. This finding is supported by Tewksbury, Suresh and Holmes (2010) who similarly argue that despite some research findings which indicate differences amongst populations of note leavers versus non-note leavers, the majority of research reports that there are few if any differences in individuals who do and do not leave suicide notes. Similarly, Olson et al (2011) concluded that there was no consistent demographic differences between note leavers and non-note leavers, and that this supported the ability to generalise findings between these two groups (see also Tuckman, Kleiner and Lavall 1959; O'Donnell, Farmer and Catalan 1993).

### **3.5 Limitations**

The under-researched nature of suicide notes, the contradictory findings and the continuing issues of access to accurate data offer an opportunity for further research to clarify some of our understanding of these issues. First, this research increases reliability of the data by using a range of information from a variety of sources (police report, autopsy report, coroner's findings) in the coronial investigation to create a distinct picture of each death. Such research findings will be

more reliable, for example, than using only ABS statistics as these rely in turn on cause of death certificates, which may only record the cause of death (e.g. asphyxiation) and not the circumstances of death (e.g. suicide) (McKenzie, 2004; Senate Community Affairs Reference Committee, 2010). Second, this research accessed one whole year of death investigations of suicide findings in Queensland. This meant that 564 complete files were identified. Finally, a large range of risk factors and characteristics were available through the coronial death investigation. This has meant that we have been able to create a more complex picture of the suicide note leaver than might be otherwise available. For example, rather than simply relying on the traditional hand written suicide note, we have been able to include verbal threats to family prior to the completed suicide.

#### **4. The Current Study**

We rely on data drawn from closed coronial files for completed suicides of Queensland residents that occurred in Queensland during 2004. The classification of a death as a suicide was based on a definition developed in consultation with the state coroner and the chief forensic pathologist and consistent with that used by the Australian Institute of Suicide Research and Prevention (AISRAP) (DeLeo, Klieve and Milner 2006).

The coronial files (and in particular the police report and autopsy report) contain information on the cause and circumstances of death, demographics of the victim, location of death and residence of victim, as well as information on the presence and form of a suicide note.<sup>1</sup> A team of six non-medical researchers coded information from paper files on site at the Coroners Court in Brisbane. The coding schedule was initially piloted using 50 closed cases from 2005, resulting in some

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<sup>1</sup> In late 2003, the new *Coroner's Act 2003* (Qld) introduced significant changes to the way coronial matters are dealt with for deaths occurring on or after 1 December 2003. One of these changes was the requirement for more comprehensive records to be kept by the police in attendance at the scene of a death. This legislative change means that, since December 2003, more comprehensive information is available about the circumstances of the death.

refining of instructions and codes. This data was supplemented with census-based measures of remoteness and socio-economic disadvantage (matched on postcode of residence).

#### **4.1 Study sample**

The sample consists of the full population of suicides by Queensland residents that occurred in Queensland during 2004. In 2004, there were 564 cases of deaths in Queensland that met the definition of suicide. However, 31 cases (or 5.5%) were removed as these cases involved deaths of non-Queensland residents, victims with no fixed address, victims with unidentifiable residential postcodes (so their residency could not be determined), or had no matching cross-reference in the Australian Institute of Suicide Research and Prevention records. Thus, the final sample consisted of 533 suicides within the study period. Of these, 83.1% (n=434) were male, 5.3% (n=28) were Indigenous, and the mean age at death was 43.8 years. The majority of victims' last known residence was in a major city (66.2%, n=353). The most common mode of suicide was asphyxiation (45.8%, n=244), mostly by hanging (about 43.0%, n=229, of the total suicides). Just over half of the sample (52.5%, n=280) had known mental health issues. About 61.0% (n=325) of the suicides in the sample were accompanied by a suicide note. The most common form of suicide note was handwritten (59.4%, n=192, of those who left notes).

#### **4.2 Study measures**

We are interested in two dependent variables. Our first dependent variable of interest is whether a suicide note was left (coded '1' for presence of a note and '0' for no note). The second dependent variable is a categorical measure for the form of the suicide note (handwritten, verbal, electronic, mixed).

We examine the effect of six independent variables: victim's age at death; victim's sex; Indigenous status of victim; socio-economic status of the victim's residential location; victim's mental health issues, and mode of suicide. The measurement of these variables is described in Table 1. However, three variables require further discussion. First, Indigenous status was generally determined by police officers attending the scene using appearance, name and potentially from information provided in interviews. This may mean that the data may under-count the number of Indigenous suicides.

Second, a direct measure of the socio-economic status of the victim was not possible as information about socio-economic status (e.g. occupation, education, income) was generally absent in the coronial files. As a result, we measured socio-economic status indirectly through the decile score on the 2006 Socio-Economic Indexes for Areas (SEIFA)<sup>2</sup> for Queensland using the postcode of the victim's last known residence. The SEIFA indices summarise the general socio-economic status of the area in which an individual resides (Australian Bureau of Statistics, 2008). The SEIFA indices have been converted to a decile score, with '1' indicating the area is in the lowest 10% and '10' in the highest 10%. We recognise that this is an aggregate measure of socio-economic status, and may obscure heterogeneity in individual socio-economic status within these geographical areas, resulting in the misclassification of individuals (Wise & Mathews, 2011). Thus, we can only make conclusions about the effect of the *average* socio-economic characteristics of the area in which the victim last resided.

[INSERT TABLE 1 ABOUT HERE]

## 5. Results

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<sup>2</sup> The 2006 SEIFA indexes are the closest in time to our study period.

Our analysis proceeded in two stages. First, we examined the bivariate differences in demographic characteristics and mode of death between those who left suicide notes and those who did not, as well as between the different forms of suicide note. Second, we estimated logit models to estimate the separate independent effects of age at death, sex, Indigenous status<sup>3</sup>, socio-economic status, location of residence, mode of death and mental health issues on the presence of suicide notes, and their form.

### **5.1 Differences by presence and form of suicide note**

Table 2 summarises the demographic profile of those who left suicide notes compared to those who did not leave notes. Few statistically significant differences were found between the two groups. Victims who left notes (compared to those who did not) were more likely to have used gas to commit suicide (19.1% vs 10.6%,  $p < 0.05$ ), and less likely to have involved a vehicle or train (1.2% vs 4.3%,  $p < 0.05$ ). However, overall, there were few substantive bivariate differences in the profiles of those who left notes and those who did not.

[INSERT TABLE 2 ABOUT HERE]

### **5.2 Effect of demographic characteristics, mode of death and mental health issues on presence and form of suicide note**

In Table 3, we report the results of our logit models to identify the impact of demographic characteristics, mode of death and mental health issues on the presence and form of suicide notes. However, due to small numbers, we recoded the mode of suicide into a series of dummy variables for asphyxiation, shooting, gassing, poisoning, and other mode. (This use of “other” mode is not uncommon in suicide research, see e.g. Graham and Burvill, (1992)). Similarly,

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<sup>3</sup> Due to the large known disparities, we have included Indigenous status in the model, despite the small number of suicide victims (n=28) who are identified as Indigenous.

numbers in the analyses for the form of suicide notes was restricted to handwritten and verbal, as less than 11% of note leavers left electronic or mixed form notes. Both models appeared to fit reasonably well, with 62.66% (for presence of a suicide note model) and 70.00% (for form of the note model) of cases correctly classified. The results were reported as odds ratios, which represented the probability of the presence of a suicide note versus the probability of no suicide note. For example, for each year increase in an offender's age, there was a 1.005 increase in the logged odds of a suicide note being present versus not present.

[INSERT TABLE 3 ABOUT HERE]

### ***5.2.1 Presence of a suicide note***

Overall, we found that after adjusting for other variables in the model, there was suggestion of some independent demographic differences in the likelihood of the presence of a suicide note. Both being female and being Indigenous, although not significant at conventional levels, had reasonably large estimated effects on the presence of a suicide note versus no note. For instance, consistent with other research, being Indigenous reduced the likelihood of leaving a note (O.R.=0.790,  $b=-0.235$ ,  $s.e.=0.427$ ). We also found that female victims (compared to male victims) were less likely to leave a note, after adjusting for other demographic characteristics, mode of suicide, and known mental health issues (O.R.=0.761,  $b=-0.273$ ,  $s.e.=0.242$ ).

Due to small sample sizes in these sub-groups, and thus larger estimates of standard errors, we did not attain conventional levels of significance. However, as we have analysed a full population of suicides of Queensland residents in Queensland for 2004, the size of the estimated effects suggest further research into the impact of gender and Indigenous status is warranted.

Conversely, our model indicated that, after controlling for other factors, age and socio-economic rank of last known residence did not have an effect on the presence of a suicide note. The estimated odds ratios are very close to 1.0, and not significant at conventional levels (for age: O.R.=1.005, b=0.005; s.e.=0.005; for socio-economic rank: O.R. 1.018, b=0.018, s.e.=0.041). Similarly, the presence of known mental health concerns also did not significantly increase the likelihood of the presence of a suicide note (O.R.=1.089, b=0.085, s.e.=0.186).

Finally, the mode of suicide was related to the likelihood of the presence of a suicide note, net of other factors in our model. In particular, victims who used gassing (compared to “other” methods) were significantly more likely to leave a suicide note versus no note (O.R.=2.700, b=0.993, s.e.=0.450,  $p<0.05$ ).

### **5.2.2 Form of the suicide note**

For victims who left a suicide note, we then examined the effect of demographic characteristics, mode of death and mental health issues on the form of the suicide (handwritten, coded ‘1’, versus verbal, coded ‘0’). Those who left a suicide note in another or mixed forms (n=35, just under 11% of the sample) were excluded from this analysis, due to small numbers. Thus, the results reported in the final columns in Table 3 are based on 290 suicide victims who left notes. Again, small sample sizes in sub-groups meant larger estimates of standard errors.

There are some interesting findings around the impact of demographic characteristics on the form of the suicide note. For instance, being female significantly increased the likelihood of the note being handwritten, rather than verbal (O.R.=3.527, b=1.260, s.e.=0.463,  $p<0.05$ ). For each decile increase in the socio-economic rank of the area in which a victim lives, there was an increase in the likelihood of a note being handwritten (O.R.=1.127, b=0.446, s.e.=0.065,  $p<0.10$ ). Being

Indigenous (O.R.=0.416, b=-0.876, s.e.=0.701) and having a known mental health issue (O.R.=0.665, b=-0.408, s.e.=0.281) decreased the likelihood of a handwritten, compared to verbal, note.

The findings for the effect of mode of suicide are mixed. For example, victims who committed suicide by gassing (compared to “other” methods) were more likely to leave a handwritten note (O.R.=3.088, b=-0.451, s.e.=0.589,  $p<0.10$ ); although not significant at conventional levels, victims who used poison were less likely to leave a handwritten note (O.R.=0.637, b=-0.451, s.e.=0.515). Of interest was the finding for shooting, victims who used lethal technologies were more likely to leave a handwritten note, net of other factors (O.R.=1.303, b=0.265, s.e.=0.627). However, it must be remembered that this is compared to victims who jumped, drowned, threw themselves in front of vehicles and trains, immolated/electrocuted and used sharp implements.

## **6. Discussion.**

There are a number of significant findings that add to our knowledge of those who leave suicide notes and their relationship to the general suicide population. First, in terms of the number of suicide notes, by including electronic notes and verbal threats alongside the more traditional handwritten notes, we found that a large percentage of the population (325 or 61%) made attempts to explain their motivation and/or signal their intent to kill themselves. This is a much larger proportion of the suicide population than have otherwise been identified in the literature. If we exclude those who made verbal threats only, the proportion of this population who left notes (either hand written or electronic) decreased to 39% of the total suicide population, but this still placed our findings either beyond or within the upper range of previous research (Shiori et al 2005; Callinan and Davis 2009; Tewksbury, Suresh and Holmes 2010; Olson 2011 et al).

Explanations for this greater number of notes may be found in the source of our data which was based on the completed coronial file and included a thorough investigation of each matter by police, pathologists and counsellors. As O'Donnell, Farmer and Catalan (1993) note, suicide notes can only be obtained 'through close collaboration with coroners and others involved in the certification of death', without which problems with data collection occur which 'are sure to have constrained research in this area.' This research was not constrained by such lack of access and was well supported by senior staff in the coronial office who allowed access to every death for 2004. Furthermore, the classification of a death as a suicide was based on a definition developed in consultation with the state coroner and the chief forensic pathologist which allowed for re-coding and re-classifying of all files to ensure consistency of suicide findings across a large state with a diverse range of Coroners. Finally, input was sought from AISRAP with whom we shared files from 2004 to cross check the accuracy of our data for suicide for that year.

Second, and in contradiction to previous research which compared note leavers with those who did not leave notes, we found some evidence of differences at least for Queensland in 2004. However, this remains a cautious conclusion: as is the case with other research in this area, part of the problem is the small numbers of female and Indigenous suicide victims which made estimation more difficult. There were hints in our analysis (given the magnitude of the estimated coefficients) that being Indigenous and being female may reduce the likelihood of leaving a suicide note. The suggestion of a lower likelihood of female suicide victims leaving notes is in direct contrast to prior research which has suggested that when differences between men and women occur, women are more likely to leave notes. In our research, women were less likely to leave all forms of notes, whether verbal, written and electronic, but when they did leave notes, they were more likely to leave a handwritten or electronic note than make a verbal threat. In contrast, Indigenous people, while less likely to leave a note, were more likely to make a verbal threat than leave a written note.

Our findings for women, in light of the cautions noted above, challenge previous research on women and notes which while contradictory, has either suggested that women are more likely to leave notes (Heim and Lester 1990; Ho, Yip, Chiu and Halliday 1998; Kuwabara et al 2006), or that there are no significant differences between socio-demographic characteristics of those who leave note and those who do not (Callinan and Davies 2009; Tewksbury, Suresh and Holmes 2010; Olson 2011). Similarly, and in contrast to our discussion of women, our findings on Indigenous people is supported by the small amount of work done in the area, and lends credence to a lack of traditional markers of suicide, including suicide notes, in populations with high levels of illiteracy (Hunter et al 2001; Tatz 2005). It also challenges previous recent research that has suggested that there are no significant differences in the note leaving population when compared with those who do not leave notes, although it is acknowledged that such research is not Australian and has therefore not included Indigenous Australians as a variable.

Third, we found that a mix of lethal and non-lethal modes of suicide were related to the likelihood of leaving a suicide note. More specifically, those who chose gassing as a mode of suicide were more likely to leave a note, while those who involved a vehicle or a train were less likely to leave a note. This has some support in the literature with suggestions that more opportunistic forms of suicide are less likely to result in a note being left while those suicides that require more planning are more likely to result in the leaving of a suicide note (Kuwabara et al 2006; Ho 1998; Heim and Lester 1990). However, the more interesting differences may be in the relationship between the form of the suicide note and the mode of suicide. Our research suggests that victims using firearms or gas are more likely, when they leave a note, to use a handwritten note (compared to “other” suicides). This has some support from the literature with Tewksbury, Suresh and Holmes (2010)

confirming a significant relationship between firearm suicide and suicide notes for men, especially as they age.

Finally, and as other research has also shown, there is little evidence to support that age at death or socio-economic status of the residential area was related to the likelihood of leaving a suicide note, or its form. Similarly, in our population, the presence of a known mental health issue was not a strong predictor of the presence of a suicide note in all its forms and this was in contrast to those studies which found that a known mental health issue was less likely to result in a note. However, mental health issues *may* be related to a lower likelihood of a handwritten note. Assuming that verbal notes are likely shorter and less detailed, this finding lends support for the argument that victims with known mental health concerns feel less need to rationalise their behaviour (Ho et al 1998; Salib, Cawley and Healy 2002).

There are three key limitations of the current study that are important for any conclusions drawn. First, despite having a full population of Queensland suicides from 2004, the numbers in certain subgroups are still small (especially in terms of the needs of multivariate analysis). In addition to the implications of small sample sizes for significance testing, it means that we could not model interactions (e.g. the impact of being a young male on the likelihood of the presence of a suicide note). Second, as noted earlier, the measurement of the victim's socio-economic status is based on the socio-economic status of the area surrounding their last known residence. This means we may have mismeasured individual socio-economic status. Thus, we cannot completely rule out a class effect, as this measure is simply the independent effect of the average class of the postcode of the last known residence. Finally, although our models contain the main factors explored in past research on suicides and suicide notes, there are other possible variables that could influence the

presence or absence of a suicide notes (such as education level, family characteristics, past attempts) that we were unable to take into account in our models.

## **7. Conclusion.**

This paper has addressed the limited research which explores the characteristics of note leavers and their comparison to the general population of those who commit suicide. While the findings from previous research are contradictory, this research has made a number of significant findings. First, when suicide notes are widened to include not only the traditional hand written note, but electronic forms, verbal threats and notes in combination, the majority of suicides signal their intent and motivation for the suicide. Even when verbal threats are removed, a thorough engagement with all coronial files means that suicide notes can be identified in more than one third of suicides, supporting the conclusion by O'Donnell, Farmer and Catalan (1993) that without close collaboration with coronial files, will have constrained research findings. Second, our analysis has concluded that women and Indigenous Australians are less likely to leave a suicide note and this challenges recent research which has suggested that no significant differences exist between the socio-demographics of the note leaving and non-note leaving populations. Third, mode of suicide is significantly correlated with note taking, with gassing more likely to result in a note, and vehicle or train less likely to result in a note. Finally, if we widen the form of the note to include verbal threats, the existence of a mental illness does not significantly correlate with leaving a note, thus challenging research which suggests that having a diagnosed mental illness makes you less likely to leave a note. The decreased likelihood of a note is only correlated with mental illness when verbal threats are removed.

Thus while the majority of our findings support research which suggests that the note leaving population is comparable to the non-note leaving population, there are some significant differences

that our research suggests need to be taken into account in further studies. This is particularly important for research that uses suicide notes to gain insight into the motivation for suicide more generally since its relevance relies upon those leaving suicide notes being comparable to the larger suicide population (Matykiewicz, Duch and Pestian 2009; Leenaars and Lester 1991; Lester 1998; Leenaars, Lester and Wenckstern 1999; Lester and Linn 1998; Leenaars et al 2003; Leenaars 1992). This study has estimated the impact of demographic and mode of suicide factors on the likelihood of the presence of a suicide note using multivariate analysis. This has enabled us to start disentangling the independent separate effects of these factors. This study provides empirical evidence that cautiously suggests that there may be some differences between suicide note leavers and non-note leavers. Of these, the effect of gender is particularly interesting, suggesting that unlike in other studies, women may be less likely to leave notes. However, there remains considerable work to do in this area.

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**Table 1. Description of Study Variables**

<b>Variables</b>	<b>Description</b>
<i>Independent variables</i>	
Age at death	In years.
Sex	0=male; 1=female.
Indigenous status	0=non-Indigenous; 1=Indigenous. Identification as Indigenous is based on police determination at the scene (through appearance, name and interviews).
SES rank	Decile based on 2006 SEIFA indices for Queensland for the postcode of the last known residence of the victim. Lower values indicate more disadvantaged.
Mode of suicide	Refers to main cause of death (first cause noted in the autopsy report). 1=hanging/ashyxiation; 2=shooting; 3=gassing; 4=poisoning; 5=jumping from a height; 6=drowning; 7=sharp implement; 8=vehicle or train; 9=immolation (including electrocution). Categories based on classifications used by Large and Neilssen (2007: 433).
Mental health concerns	0=no mental health concerns known; 1=mental health concerns noted by medical practitioner or family member.
<i>Dependent variables</i>	
Presence of suicide note	0=no; 1=yes, left a note.
Form of note	1=handwritten; 2=verbal; 3=electronic (phone, e-mail, text); 4=mixed.

**Table 2. Differences in Demographic Characteristics, Mode of Suicide and Mental Health Issues by Presence of Suicide Notes (Queensland, 2004, N=533)**

Variables	Total	Did not leave a note	Left any note	Left a handwritten/electronic note
<i>Victim demographics</i>				
Mean age at death	43.8 (18.0)	42.6 (18.2)	44.5 (17.8)	44.9 (17.7)
% female	18.6	21.2	16.9	20.2
% Indigenous	5.3	7.2	4.0	2.9*
Mean SES rank	6.6 (2.5)	6.5 (2.7)	6.7 (2.4)	7.0 (2.3)*
<i>Mode of suicide</i>				
% hanging/asphyxiation	45.8	49.5	43.4	40.4 <sup>#</sup>
% shooting	8.8	7.7	9.5	8.7
% gassing	15.8	10.6	19.1**	24.0***
% poisoning	16.7	15.9	17.2	15.4
% jumping	4.1	5.8	3.1	3.4
% drowning	2.8	2.9	2.8	1.9
% sharp implement	2.4	2.9	2.2	2.9
% vehicle/train	2.4	4.3	1.2*	9.6*
% immolation	1.1	0.5	1.5	2.4
<i>Mental Health Concerns</i>				
% with known mental health issues	52.5	51.9	52.9	51.0
<i>Presence of suicide note</i>				
% with a note	61.0	---	---	---
<i>Form of note</i>				
% handwritten	---	---	59.4	---
% verbal	---	---	29.9	---
% electronic	---	---	4.6	---
% mixed	---	---	6.2	---
Number of cases	533	208	325	208

#p<0.10 \*p<0.05 \*\*p<0.01 \*\*\*p<0.001 (test of difference)

Notes:

a. Means (with standard deviations in brackets) are reported for continuous variables; percentages are reported for categorical variables.

b. T-tests for difference between group means, and z-test for difference between group proportions, are used to test whether there is a significant difference between those who did not leave a suicide note and those who left a suicide note or those who left a handwritten or electronic suicide note, respectively.

**Table 3. Logit Results for Presence of a Suicide Note and Form of Suicide Notes on Demographic Characteristics, Mode of Death, and Mental Health Issues (Queensland, 2004, N=533)**

Variables	Presence of a Suicide Note Model			Form of the Suicide Note Model <sup>a</sup>		
	b	s.e.	O.R.	b	s.e.	O.R.
<i>Victim demographics</i>						
Age at death	0.005	0.005	1.005	0.004	0.008	1.004
Female	-0.273	0.242	0.761	1.260 <sup>***</sup>	0.463	3.527
Indigenous	-0.235	0.427	0.790	-0.876	0.701	0.416
SES rank	0.018	0.041	1.018	0.120 <sup>#</sup>	0.065	1.127
<i>Mode of suicide<sup>c</sup></i>						
Asphyxiation	0.327	0.287	1.387	-0.257	0.470	0.774
Shooting	0.622	0.418	1.863	0.265	0.627	1.303
Gassing	0.993 <sup>***</sup>	0.350	2.700	1.128 <sup>#</sup>	0.589	3.088
Poisoning	0.504	0.331	1.656	-0.451	0.515	0.637
<i>Mental Health Issues</i>						
Known mental health concerns	0.085	0.186	1.089	-0.408	0.281	0.665
Constant	-0.141	0.466		-0.520	0.737	
$\chi^2$ (d.f.)	17.85(11) <sup>#</sup>			41.32(11) <sup>***</sup>		
Pseudo R2	2.50			11.18		
% correctly classified	62.66%			70.00%		
N	533			290		

# p<0.10; \*p<0.05; \*\* p<0.01; \*\*\* p<0.001

Notes:

- a. The form of the suicide note analyses excluded cases in which the note was in electronic (n=15 or 4.6% of note leavers) or mixed forms (n=20, or 6.2%). The reference category is 'verbal'.
- b. Reference category is lived in a regional area.
- c. Reference category is other mode.