COMPLETED SUICIDE IN WESTERN AUSTRALIAN YOUTH: A STUDY OF 96 CASES AGED 15-24 YEARS

Sven Silburn
and Stephen Zubrick
Western Australian Research Institute for Child Health
Perth
Western Australia

Linda Hayward
Neurosciences Unit
Shenton Park
Western Australia

RECENT REPORTS OF CHANGES IN THE WORLDWIDE DEMOGRAPHY OF SUICIDE over the past few decades (Australian Bureau of Statistics 1985; US Centres for Disease Control 1986) have focused professional awareness and raised community concern about the apparent increase of suicide among youth. They have also highlighted the fact that, if effective preventive measures are to be developed, there is an urgent need to describe the characteristics of young people who take their own lives and to identify possible current causative influences.

While the overall rate of suicide in the Australian population has remained remarkably stable at about 11 per 100,000 over the past century, analysis of age specific rates show important trends over the past few decades (Burvill 1980; Goldney & Katsikitis 1983; Kosky 1987; Hayward et al. 1988). Increased suicide has been noted in both the very old (80 and over) and young persons (15-34) (Hassan & Carr 1989). For the over 80 age group the actual numbers involved are small. On the other hand, the increase among the
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young represents a very significant trend, particularly for males. In the 25-year period 1972 to 1987, the age specific suicide rate among males aged 15 to 24 has steadily increased from 15.2 to 22 per 100,000 while the rate for females age 15 to 24 initially decreased from 6.5/100,000 in 1972 to 3.5/100,000 in 1982 and then increased to 5.75/100,000 in 1987 (Australian Bureau of Statistics 1989).

The changing demography of youth suicide in Australia reflects the worldwide increase in the mean rates for suicide in the 15 to 24 age group for countries contributing statistics to the World Health Organization (Barraclough 1988). Australian rates for males in this age group have shown a parallel increase to that recorded in the USA, with both countries having age specific rates of 21/100,000 in 1987. This is three times the corresponding rate in England and Wales which has remained fairly constant averaging 6/100,000. By contrast, the reported rate for male Japanese youth has steadily declined from 20/100,000 to 14.5/100,000 over the same period (World Health Organization 1989).

The absence of similar increases in older age groups suggests the possibility of relatively new factors that specifically influence adolescents and young adults and invites speculation as to causative influences which may have affected the present generation of youth. Kreitman (1976) has suggested that the increase in suicide among younger males is a relatively new phenomenon in developed countries which may be related to the emergence of the illicit drug culture among the young. Goldney and Burvill (1980) have suggested the possibility that it may be related to heavier alcohol consumption of younger males in recent years.

Shafii et al. (1985) found that 70 per cent of young suicides were substance abusers. Fowler et al. (1986) found that 53 per cent of 133 consecutive young suicides in San Diego had a principal diagnosis of substance abuse—particularly alcohol, marijuana and cocaine. This contrasts with a lifetime prevalence of 11 to 18 per cent in the general population aged 18 to 24 years (Robins et al. 1959) suggesting relative risk of suicide among drug abusers of between 5 and 9. The substance abuse was typically a chronic condition, present for 9 years.

Changes in the structure and circumstances of the family have also been linked with the recent apparent rise in youth suicide rates. There are several reports in the literature of the association between family conflict and suicidal behaviour in young people (Barter et al. 1968; Kosky 1983; Reynolds et al. 1988; Kosky et al. 1986 & 1990).

Shafii et al. (1985) reported significantly increased risk for suicide in adolescents who were exposed to past suicidal behaviour in parents, relatives and friends. They also reported a significant association with parental history of emotional problems. Deykin et al. (1986) have hypothesised that there may be an association between the increasing rates of suicidal behaviour among adolescents and the increasing rates of child abuse and neglect which have been reported over the past decades. They also have commented on the fact that the prevalence of known risk factors for child abuse and neglect, such as young and single parenthood, diminished social supports, poverty and unemployment has also increased over these decades.

Other environmental influences have been identified as having differential effect on youth as opposed to older sections of the population. Predicted rates of suicide have been shown to increase in the weeks immediately following nationally televised news broadcasts about suicide (Phillips & Carstensen 1986; Gould et al. 1988). Population pressure has been causally implicated in the rise in suicide rates in youth cohorts. Holinger (1987) reported a population cohort size effect. He found a positive correlation (r=0.34) between the suicide rate for the 15 to 24-year-olds and the proportion of 15 to 24-year-olds in the US population over the years 1933-1987. This positive correlation was not found for other age groups in which the correlation was negative. Possible effects of such a population pressure might include the accentuated development of the adolescent 'sub-culture', increased
competition for available employment and educational placements and increased stress on
the juvenile justice, educational and welfare systems.

There have been relatively few investigations of completed suicide among youth which
have attempted to delineate factors associated with youth suicide in Western societies.
Studies have been carried out in England and Wales (Shaffer 1974) and in Canada (Pettifor
et al. 1983; and Garfinkel & Golombek 1983).

In the United States, Shafiï et al. (1985) conducted a detailed 'psychological autopsy'
(that is using all available information including medical and coronial records and interviewing
the relatives and friends of the deceased) on 20 young people aged 19 and under; Poteet
(1987), Thompson (1987) and Hoberman and Garfinkel (1988) have conducted
retrospective descriptive studies based on information from coroners' and medical
examiners' records with group sizes of n=87, n=190 and n=229 respectively; Brent et al.
(1988) compared 27 adolescent suicide victims with 56 suicidal inpatients.

With the exception of Pettifor et al. (1983) and Brent et al. (1988), all these
investigations were descriptive studies employing no control or comparison groups; they
vary in the extent to which their data collection methods were specified; most have relatively
small subject numbers and they cover varying age ranges.

This present study aims to provide a population description of all officially recorded
suicides by young persons aged 24 and less in Western Australia for a 36-month period
from 1986 to 1988 and provide estimates of relative and attributable risk for associated
factors.

Methods

Case identification for this study was based upon coronial records and the data described
reflect the coroners' ruling of suicide. All cases so identified for the 36-month period from
January 1986 to December 1988 are included. Each recorded case of suicide was
reviewed by one of the authors for case details and data were collected for the following
domains: individual characteristics (age, sex, place of birth, current relationship/s),
demographic details (place of residence, employment status), health history (health at time of
suicide, past history) and details of suicide (time, method, place, blood alcohol level,
evidence of substance abuse, precipitating circumstances).

Age-specific and age standardised mortality and hospitalisation rates were calculated
using CHAMP (Epiwest Software, 1986). Age standardised rates were calculated by the
direct method and were based on the age distribution of the Standard World Population so
as to facilitate comparison of results from other Australian states and other countries. The
most recent Australian Census was made during the survey period. In June 1986 there
were 239,350 West Australians aged 15 to 24 years out of a total state population of
1,406,930.

Results

Factors related to youth suicide in Western Australia

During the 36-month period from 1986 to 1988 there were 96 officially recorded suicides
among youth under the age of 25 years. In 1986 there were 25, in 1987 there were 28 and
in 1988 the number increased sharply to 43. These numbers, when expressed as age
standardised rates per 100,000 population, give rates of 10.4 and 11.7 for 1986 and 1987
respectively and 17.9 for 1988.
Of the 96 suicides of young people that occurred in the three-year period, 80 per cent were male and 20 per cent were female. They were all 14 years of age or older, with the highest frequency among 18 and 19-year-olds (see Figure 1). The mean age for males (20.3 years) was 1.3 years older than that of females (19.0 years).

The proportion of cases who were white of Caucasian ethnic origin was slightly lower than the proportion in the WA youth population (68 per cent of cases vs. 76 per cent of population). There was an over-representation of Aboriginals (7 per cent vs. 3.6 per cent).

Migrant groups were generally not over-represented. The larger migrant groups from the United Kingdom and Europe had suicide rates comparable to their representation in the WA youth population (14.5 per cent vs. 14 per cent). However, while the actual numbers involved did not permit meaningful statistical comparison it did appear that some of the smaller migrant groups could be over-represented. These included those born in New Zealand (5 per cent vs 2.5 per cent), India and Malaysia (3 per cent vs. 1.5 per cent) and South Africa (2 per cent vs. 1 per cent).

Over two-thirds (69 per cent) of the suicides occurred in the Perth metropolitan area. This figure corresponds to the proportion of the overall youth population aged 15 to 25 living in metropolitan area of Perth (72 per cent). However, when the teenage group were considered separately it was found that non-metropolitan cases accounted for 41 per cent of the cases in the 15 to 19 years age group. This compares with 28 per cent of the 15 to 19-year-olds who live in the non-metropolitan areas of the state ($\chi^2=3.6, \text{ df}=1, p<.05$).

The highest rates occurred in the more remote and isolated areas of the state. The Kimberley and Great Southern Regions recorded age specific rates of 30 and 26.5 per 100,000 youth aged 15 to 24 years respectively. This is in contrast to the Perth metropolitan rate of 12.8 per 100,000.

Figure 1

Age and Sex Distribution, Youth Suicide
Western Australia, 1986-88
Methods used in youth suicide

The methods of suicide used by males and females are shown in Figure 2. Over the three-year period studied the most commonly used method of suicide was carbon monoxide poisoning (32 per cent), followed by firearms (25 per cent), hanging (22 per cent), drug overdose (8 per cent) and jumping from a building or bridge (3 per cent). While hanging was equally represented in both metropolitan and country areas, other methods tended to reflect their availability, for example carbon monoxide, drug overdose and jumping from high places were more common in the city while the use of a firearm was twice as likely to occur in the country. Fifty-two per cent of the suicides committed the act in or around their home, 19 per cent went to a bush area, the remainder used a variety of other venues.

Of particular note was the fact that there was a substantial increase in the numbers of youth suicides by hanging in 1988 in comparison with previous years. In 1968 there was only one such death in this age group, in 1987 there were 5 and in 1988 there were 15. Comparison with aggregated ABS data (Australian Bureau of Statistics 1983) on method of suicide among youth in Western Australia over the period 1968-88 suggests that this represents a significant trend (see Figure 3).

During 1988 there was much media publicity given to a Royal Commission of Inquiry into Aboriginal deaths in custody. We were therefore interested in establishing how many of the youths who hanged themselves were Aboriginal and how many had done so in custody. Of the 13 people who died in custody in Western Australia during 1988, there were two whose cause of death was asphyxia due to hanging but none of these were in the age group 14 to 24 years. All but one of the 15 cases in this study who hanged themselves during 1988, were male and two were Aboriginal. Two-thirds (that is 10 cases) were resident in the metropolitan area of Perth. Two-thirds had recorded previous suicide attempts and one-third (5 cases) had multiple previous attempts which is double the corresponding rate of the overall study sample.

Figure 2

Sex and Method of Suicide
Youth aged 14-24 Years
Western Australia, 1986-88
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As the date of death of these cases was not evenly distributed over the year, but tended to cluster around two particular months, the authors are currently examining whether these periods correspond with the number and prominence given to news reports regarding deaths in custody at that time.

**Figure 3**

Trends in Method of Suicide  
Youth aged 10-25 Years  
Western Australia, 1968-88

**Alcohol and other drugs at time of suicide**

At the time of death alcohol was detected in the blood of half of the cases. Of these three-quarters (that is 38 per cent of all cases) had blood alcohol levels over 0.05 mg/mL. Other drugs or substances were detected in 56 per cent of cases, with up to 4 drugs per case being recorded. Carbon monoxide was identified in 32 per cent of cases, minor tranquillisers in 5 per cent, antidepressants in 4 per cent, cannabis in 4 per cent, opiates in 3 per cent. Other drugs detected included anticonvulsants (1 per cent), Major tranquillisers (1 per cent), barbiturates (1 per cent), inhalants (1 per cent), and other chemicals and poisons (3 per cent).

The relationship between the drug detected and cause of death was also recorded. Apart from carbon monoxide which was present in lethal doses in 32 per cent of cases, antidepressants and anticonvulsants were found in lethal levels in all the cases where they were detected. In the cases where minor tranquillisers were detected, they formed part of a
lethal combination. Cannabis, opiates and 'other drugs' were only detected at levels said to be therapeutic or less.

**Drug abuse history and suicide**

One-third of the cases (31 per cent) were reported as having a history of drug abuse (including alcohol abuse). The drugs abused were alcohol (60 per cent), cannabis (27 per cent), opiates (3 per cent), and minor tranquillisers (3 per cent). (Note: more than one drug of abuse could be recorded for each person).

**Psychiatric history and psychological state**

Data were collected on the psychiatric history and psychological state of the suicide cases. It was found that 27 per cent of the 96 cases had sought professional help prior to the suicide. In most cases (73 per cent) this was a psychiatrist, in 20 per cent of cases it was a general practitioner and in one case it was a psychologist. However only 20 per cent of all the cases were receiving treatment at the time of suicide, and for 84 per cent of these, the treatment included medication, which was either antidepressants, minor tranquillisers, or a combination of the two.

Formal psychiatric diagnoses were available on most of the cases who were receiving treatment. These included schizophrenia (38 per cent), manic depression (6 per cent) other depressive disorders (17 per cent), anxiety disorder (6 per cent), personality disorder (22 per cent). In 71 per cent of the 96 suicides, family and friends told authorities that the person had been depressed for a period of more than two weeks prior to their suicide. Where a lifestress event had preceded the suicide a record was made of the type of event. Figure 4 shows the distribution of these life-stress events for male and females. One half of the cases (49 per cent) had experienced relationship difficulties or a recent breakup of a relationship. Nineteen per cent (19 per cent) had recently lost their job. Sixteen per cent (16 per cent) were reported to have conflict with their families. Unemployment had been a factor for 13 per cent of cases and a similar proportion (13 per cent) were reported to be troubled by financial problems. Trouble with the law was reported in 12 per cent of cases; the death of a close family member or friend was reported as a significant stress for 9 per cent of cases; physical illness was reported as a stress for 7 per cent and a further 12 per cent were upset about their psychiatric illness.

Prior to the suicide, over one-third (36 per cent) of the decedants had told others of their intention to commit suicide and 33 per cent left a suicide note. One third of the cases (33 per cent) had made prior suicide attempts and half of these (16 cases) had made more than one attempt and one case had 10 prior attempts.

**Sex differences in youth suicide**

Females were more likely to be sober at the time of suicide than males. Sixty seven per cent (67 per cent) of the 18 female suicides had no alcohol at all, and 16 per cent had blood alcohol levels (BAL) of over 0.08 mg/mL. Forty-six per cent of the 77 males had no alcohol at all, the remaining male cases had BAL varying from 0.01 mg/mL to 0.18 mg/mL, 55 per cent of these had BAL of over 0.05 mg/mL.

Approximately one-third of both males (31 per cent) and females (33 per cent) were reported to have a history of drug or alcohol abuse. Only females abused minor tranquillisers and only males abused opiates; both sexes had histories of alcohol and cannabis abuse.

Males did not differ from females on the proportion of cases in which family and friends said that the person was depressed immediately prior to the suicide. Reports of depression
were present in nearly three-quarters of both males (70 per cent), and females (78 per cent).

A significant life-stress event in the period immediately prior to the suicide was identified for all but 14 per cent of males and 17 per cent of females (see Figure 4). Of the type of event identified, males and females only differed on report of relationship problems, which was an issue for 44 per cent of the females and 10 per cent of the males ($X^2=4.7$, df=1, p<.05).

Females were more likely to have threatened to suicide prior to the act, with 33 per cent of females and 20 per cent of males making such a threat. They were also more likely to have made a previous attempt—55 per cent of females and 29 per cent of males having attempted in the past ($X^2=4.67$, df=1, p<.05).

Females were more likely than males to have sought help from a professional prior to the suicide, 50 per cent of the females had sought help in contrast to only 22 per cent of 77 males ($X^2=4.4$, df=1, p<.05). Females were also more likely to have had recorded histories of psychiatric treatment. Ten per cent (10 per cent) of males and 39 per cent of females had received such treatment ($X^2=8.5$, df=1, p<.01).

**Figure 4**

**Precipitating Circumstances and Life-Stress Events, Youth Suicide**

**Western Australia, 1986-88**

**Age specific characteristics**

Forty-six per cent of the cases were teenagers and 54 per cent were aged 20 to 24 years. These two age groups were compared on a range of demographic and clinical variables.
Both groups showed an essentially similar distribution of gender, ethnicity, and migrant status. The only demographic variable which differentiated between the younger and older groups, was metropolitan vs. country residence. There was an increased representation of younger cases in country areas and a corresponding increased representation of older cases in the city ($X^2=3.5$, df=1, p<0.1).

Clinically, the younger group was more likely to have had conflict with their family ($X^2=9.9$, df=1, $p<.005$), to be in trouble with the law ($X^2=7.6$, df=1, $p=.01$), to have made suicide threats prior to their death ($X^2=3.2$, df=1, $p=.1$) and had higher rates of adjustment and personality type difficulties as opposed to psychotic disorders such as schizophrenia.

They did not differ from the older cases with respect to the proportion of cases in their method of suicide, history of previous attempt and report of depression. They had both sought and received treatment at similar rates. A similar proportion of cases was reported to have a history of drug and/or alcohol abuse in both the younger and older groups. However, the older group were more likely to be intoxicated at the time of suicide, that is had blood alcohol levels (BAL) over .05 per cent at the time of their death ($X^2=6.2$, df=1, $p<.05$).

As our initial choice of age grouping was made on the basis of statistical convenience, we considered that a more developmentally appropriate age-cut would be at the age when young people leave school. On repeating the analyses with those of school age, that is age 17 and less (19 per cent of cases) and those aged 18 to 24 years (81 per cent of cases), the only additional age specific differences to emerge were that females were more likely to be represented ($X^2=5.9$, df=1, $p<.05$) and that there were no Aboriginal suicides in the school age group. The stresses of family conflict ($X^2=17.4$, df=1, $p<.0001$) and trouble with the law ($X^2=4.6$, df=1, $p<.05$) were again identified but were at more significant levels in the school age group.

**Risk estimates**

Relative and attributable risk estimates were derived by a comparison of the percentage of occurrence of specific individual characteristics in the suicidal population, to the best available estimate of the rate of each of those characteristics in the general Western Australian youth population (see Figures 5 and 6).

As there were no known prevalence data available on suicide attempt in the WA youth population, we used the Health Department of WA hospital discharge data to derive a conservative estimate of the cumulative total of youth in the 15 to 24 age group who had been admitted to hospital following a suicide attempt up to and including 1987. This suggested a lifetime prevalence of 0.94 per cent for males and 1.81 per cent for females of suicide attempt in this age group. Comparison with the percentage of study cases with prior suicide attempts revealed a relative risk (RR) of 30 for males and 30.9 for females. When adjusted for the population size of the affected group with known prior suicide attempts, this gave population attributable risks of (PAR) of 21.5 per cent for males and 35.1 per cent for females.

Estimation of the risks associated with depression was problematic for two reasons: firstly, information regarding the occurrence of depression among the 96 cases was only available from the retrospective reports of parents, friends and associates; secondly, the actual prevalence of depression in the WA youth population is unknown. The authors nevertheless chose to make their relative risk estimate using a prevalence figure of 9 per cent. This was chosen on the basis of rates of DSM-III type definition of depression of moderate diagnostic certainty reported elsewhere (Flemming et al. 1989). This also corresponded with the rate of significantly depressed affect reported in Reynolds and Robb’s (1988) community survey of 600 Sydney adolescents. Using this figure the relative
risk associated with depression was estimated to be RR=7.8 and the population attributable risk (PAR) to be 38 per cent.

Figure 5
Relative Risk Estimates
Youth aged 14-24 Years
Western Australia 1986-88

A history of heavy drinking was reported in 60 per cent of the decedants. This, when compared with recent community survey data (Australian Bureau of Statistics 1985) on the proportion of the WA youth population over the age of 18 years who are 'heavy drinkers', that is consume an average of six standard drinks (100 mL of alcohol) per day, yielded a relative risk for heavy drinking of RR=8.8 and an attributable risk of PAR=17.1 per cent. Other risk factors on which data were available, gave estimates for male gender (RR=1.5, PAR=20.31 per cent); Aboriginality (RR=1.9, PAR=3.2 per cent); and unemployment (RR=.76, PAR=3.92 per cent).
Discussion

The goal in this study was to use coronial data to describe the clinical and demographic characteristics of a three-year sample of youth who suicided in Western Australia. An examination of gender and age specific characteristics was also of interest, to identify risk factors and to document possible contributory factors to the recent increase in the rate of suicide among Australian youth.

The conclusions which can be drawn from the findings are limited by the nature of the data which it was possible to code from records made for legal coronial purposes and the fact that tests of reliability were not undertaken. The problems inherent in psychological autopsy studies such as retrospection of data collection and the effects of the suicide on the informant and interviewer are well recognised. However, there is accumulating evidence from the few controlled studies undertaken elsewhere (Pettifor et al. 1983; Brent et al. 1988; Hoberman et al. 1988) to support the reliability and concurrent validity of data derived from such studies.

This study confirms the typical characteristics of youth suicides reported by recent North American studies. These include: male gender, particularly in the 18 to 19 age group; use of highly lethal methods; intoxication at time of suicide; past history of alcohol and drug abuse; recent depression and association with recent life-stress events such as the breakup.
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of important relationships and family conflict. In the majority of cases the suicide appeared to have been an impulsive action, made with little or no warning and was usually in response to some form of situational crisis.

Characteristics particular to Western Australia which might account for the recent increase in male rates are the over-representation of Aboriginals; significantly higher rates (up to three times the metropolitan rate) in the more remote and isolated areas of the state; the over-representation of younger and school-age cases in country areas; recent increases in the proportion of suicides using highly lethal methods such as hanging and carbon monoxide; and the high proportion of cases with histories of drug and alcohol abuse.

The fact that over half of the males were intoxicated at the time of suicide would tend to support the views of Kreitman, 1976; Goldney & Burvill 1980, and Fowler et al. 1986 regarding the effect of drug use and increasing alcohol consumption among youth on the suicide rates in the younger age groups.

Of particular concern was the 54 per cent increase in youth suicide which occurred from 1987 to 1988. Almost half of this increase is accounted for by the number of young persons (15 cases) who used this method of suicide that year. We believe that the increase in the proportion of young people who took their lives during 1988 by hanging may have been affected by the media publicity given to the Royal Commission into Aboriginal Deaths in Custody which was prominent that year. Media reports during this time gave prominent emphasis to hanging as a method of suicide. Two-thirds of the fifteen cases who hanged themselves in 1988 had previously attempted suicide. By contrast only one-third of all ninety-six cases had prior attempts. This would suggest that these cases may have been particularly vulnerable to the imitative influence of such publicity. It also draws attention to the role of responsible media reporting in limiting such unintended effects.

The prevention of youth suicide is dependent on the ability to identify populations at high risk and offer interventions that modify these risks before suicide ensues. A recent review of youth suicide prevention studies (Shaffer et al. 1988) concluded that predicting who will commit suicide has frequently been dismissed as a futile enterprise in the general class of predicting rare events from common ones with all the problems of low specificity (high false positive rates). While they saw this as the principal failing of most prevention programs which adopt low-risk strategies, it may not apply to focused high-risk interventions, particularly as knowledge of specific risk factors improves.

Our identification of risk factors yielded figures which are similar to those reported previously on a smaller number of Western Australian teenagers (Silburn et al. 1988) and those reported on New York teenagers by Shaffer et al. 1988. History of previous suicide attempt was found to be the most readily identifiable risk factor with males having RR=30 and PAR=21.5 per cent and females having RR=31 and PAR=35.1 per cent. Heavy drinking (RR=7.8, PAR=38 per cent) and depression (RR=8.8, PAR=17.1 per cent) as the next highest risk factors have very much higher prevalence rates but present difficulties in identification, thus limiting their amenability in being targeted for preventive effort.

In conclusion, the authors believe that these findings lend support to preventive efforts aimed at enhancing the level of intervention and treatment given to identified high-risk groups. Such groups would include depressed young males presenting at hospital emergency departments with suicide attempts and students with significant depression identified in the school situation.

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