

A Study of the Irish System of Recording Suicide Deaths

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Abstract. *Background:* Many studies have examined the reliability of national suicide statistics. *Aims:* To examine the Irish system of certifying suicide deaths and data collected by it. *Methods:* Data were recorded from a police form (Form 104) completed and sent to the Irish Central Statistics Office (CSO) after all inquested deaths that occurred in Ireland in 2002. *Results:* Of the approximately 1,800 inquested deaths, 6% (and 4% of suicides) were not included in routine mortality statistics because of late registration. Of the 495 deaths thought by the police to be suicide, 485 (98%) were so recorded by the CSO. Information relating to medical history and contributory factors was provided in just 54% and 34% of suicides, respectively. Suicide deaths showed significant variation by weekday (excess on Mondays) and calendar month (summer peak). The peak suicide rate (35 per 100,000) was among men aged 25–34 years. Persons separated, living alone, and unemployed had significantly elevated suicide rates. *Conclusions:* There is a need for a better understanding of national suicide recording systems, as this study has provided for Ireland. Such systems may routinely provide data relating to socio-demographic factors but not relating to medical and psychosocial factors.

Keywords: Ireland, suicide recording, inquests, mortality data

Introduction

Establishing the extent of a cause of death is a fundamental requirement for related research and prevention activities. To this end, national statistics offices in all European countries – and in many non-European countries – classify the cause of every death according to the World Health Organization’s International Classification of Diseases, Injuries, and Causes of Death (ICD). This is a major undertaking requiring collaboration between many statutory agencies. For example, in Ireland, coroners, medical practitioners, police, pathologists, registrars, and vital statistics officers all have specific roles to play.

Suicide deaths present a particular challenge to classification systems chronicling cause of death. It must be evident that the death was by an external cause rather than by some illness or disease, that the death was self-inflicted, i.e., a result of the actions of the deceased, and that the deceased truly intended to cause their own death. Having to establish this intention is central to why suicide deaths may be so difficult to classify. A suicide note or other final communication constitutes evidence that the deceased intended to take their own life. However, most suicide deaths occur without suicide notes (Chia, Chia, & Tai, 2008; Ho, Yip, Chiu, & Halliday, 1998; Posener, LaHaye, & Cheifetz, 1989; Shioiri et al., 2005). Operational criteria for the determination of suicide have been developed (Rosenberg et al., 1988), but these are not incorporated in suicide record-

ing systems in the vast majority of countries. As a result, classification is left to the professionals involved resulting in different approaches being taken. In Ireland, coroners will generally take the “beyond reasonable doubt” legal approach, whereas police and doctors may take a “balance of probabilities” approach; on the other hand, cause of death coders and vital statistics officers will aim to meet the requirements of the ICD. Such very differing approaches may impact on both the scale and pattern of suicide incidence rates calculated based on the resulting mortality statistics.

Suicide also presents a significant challenge to those recording mortality statistics as a consequence of its association with stigma, guilt, and shame. The deceased, or possibly the bereaved, may have tried to disguise the suicidal nature of the death. Once homicide has been ruled out, the police may be less inclined to seek further information. Coroners may be resistant to giving a verdict of suicide or may feel pressure against doing so as has recently been evidenced by a study of the coronial system in Australia (Walker, Chen, & Madden, 2008).

Considering the challenges inherent in suicide classification, it is not surprising that there exists a significant body of evidence related to the limitations of suicide statistics (recently reviewed by Claassen et al., 2010). Suicide underreporting due to misclassification has been the main concern, and previous studies made estimates of underreporting as high as 80% with suicides misclassified to causes

of deaths, including accidental drowning, accidental poisoning, road traffic accident deaths, and the natural cause of death category – signs, symptoms, and ill-defined conditions (Clarke-Finnegan & Fahy, 1983; Cooper & Milroy, 1995; Jobes, Berman, & Josselson, 1987; Jouglu et al., 2002; Phillips & Ruth, 1993). However, suicide misclassification has most often been associated with the category “deaths of undetermined intent,” often referred to as “undetermined deaths or open verdicts” (Neeleman & Wessely, 1997). Respectively, studies in England, Finland, and France found 65%, 32%, and 35% of undetermined deaths to be suicides (Cooper & Milroy, 1995; Jouglu et al., 2002; Ohberg & Lonnqvist, 1998).

Despite irrefutable evidence of their limited accuracy, research findings based on suicide statistics have proved to be robust, leading to reassuring conclusions that epidemiologists can “compare rates between countries and districts within them, between demographic groups and over time” (Sainsbury & Jenkins, 1982), that “misreporting . . . has little discernible impact on the effects of variables commonly used to test sociological theories of suicide” (Pescosolido & Mendelsohn, 1986), and that despite underreporting, the principal sociodemographic, and geographic features and trends over time can be considered as valid (Jouglu et al., 2002). However, such conclusions cannot apply to countries that fail to supply any suicide mortality to the World Health Organization and those with implausibly low suicide rates.

Underreporting of suicide has been reported for Ireland perhaps more than for any other country (Brugha & Walsh, 1978; Cantor, Leenaars & Lester, 1997; Connolly & Cullen, 1995; Kelleher, Corcoran & Keeley, 1997; Walsh, Cullen, Cullivan & O’Donnell, 1990), and there is evidence to suggest that trends in Irish suicide have been influenced by changing levels of misclassification (Chishti, Stone, Corcoran, Williamson & Petridou, 2003; Kelleher, Corcoran, Keeley, Dennehy & O’Donnell, 1996). Research into the reliability of Irish statistics began long before the Irish suicide prevention activities, which were precipitated by the decriminalization of suicide in Ireland in 1993.

In 1995, the Irish National Task Force on Suicide was established. It found evidence to suggest that suicide underreporting in Ireland due to misclassification to undetermined deaths was no longer a significant problem (National Task Force on Suicide, 2006). As well as being a pillar on which to base suicide-prevention activities, the Task Force recognized that, with its existing infrastructure, the suicide recording system had the potential to provide a wide range of data on the circumstances and characteristics of those who died by suicide and other relevant causes of death. An arrangement existed between the Irish Central Statistics Office (CSO) and the Irish police, whereby the police provided additional information to the CSO on deaths that resulted in a coroner’s inquest (see Results section below for a description of the system of registering inquested deaths). Annually, about 1,800 deaths in Ireland result in an inquest, representing approximately 25% of all deaths referred to

coroners and about 6% of all registered deaths in the country. With respect to inquested deaths, the police provided an opinion as to whether the death was accidental, suicidal, homicidal, or undetermined in order to supplement the information on the coroner’s certificate for a better statistical classification of cause of death.

The Task Force recommended the expansion of the relevant statistical form (known as Form 104) in order to include more information relating to the deceased and the circumstances of the death, and the appointment of a researcher with the necessary access to analyze the information collected on Form 104. Form 104 is treated as strictly confidential in accordance with the Irish Statistics Act (1993), exceptional access being granted by the CSO for this study. The study was therefore afforded a unique opportunity to investigate the operation of the Irish cause of death classification system.

This paper reports the findings relating to two of the study objectives. The first objective was to examine the Form 104 reporting system with a specific focus on how this system performed for inquested deaths that occurred in Ireland in 2002 and were registered in 2002, 2003 (considered as deaths registered “on time” and included in routinely-available, official statistics) or in 2004 (considered as “late” registered deaths and excluded from routinely available, official statistics), taking into account completeness and consistency of the data recorded on the Forms 104. The second objective was to analyze the Form 104 data in order to provide novel findings related to the characteristics of the individuals who died by suicide in Ireland.

Methods

Study protocols were determined together with the Irish Central Statistics Office (CSO) after which two researchers signed declarations of confidentiality and were provided with Officer of Statistics status in order to work within the Vital Statistics Section of the CSO. Interviews were carried out with representatives of the relevant agencies in order to obtain a detailed description of how the death registration and cause of death classification system operated.

A sample of 300 Forms 104 was examined and coding frames were developed for the data items relevant to the study. An electronic data entry system was developed and installed on a stand-alone computer solely for the purposes of the study. The computer and data entry system were each password-protected and when not in use the electronic files were encrypted. Only anonymous data were recorded electronically. Data were entered from all forms relating to inquested deaths that occurred in 2002 and were registered in 2002, 2003, and 2004. The resulting Form 104 database was crossreferenced with the CSO database of inquested deaths. Where possible, entries from each database were matched on a one-to-one basis. Inconsistencies between

each database relating to common data items such as dates of death, inquest, registration, and birth were identified.

Comparisons were made between the four broad causes of deaths resulting in inquest: accidents, suicides, homicides, and undetermined deaths. Rates per 100,000 were calculated where relevant using the population data derived from the National Census 2002. Exact Poisson 95% confidence intervals were calculated for the rates using StatsDirect version 2.7.7. These intervals are displayed by error bars in the relevant charts.

Results

Registration of Deaths

The death registration and cause of death determination system that operated in Ireland with respect to deaths occurring in 2002 and led to a coroner's inquest generally involved the following chain of notifications and information transfers:

1. The police notified the coroners of the death and provided them with information. If the coroner was not satisfied that the death was by natural causes, then an inquest had to be held.
2. After the inquest, the coroners recorded information on a certificate and transferred this to registrars, thereby notifying them of the death.
3. The registrars transcribed information from the coroner's certificate onto a death registration form (Form 102) and forwarded both to the Central Statistics Office (CSO).
4. The CSO used the information from these documents to compile an electronic database of inquested deaths and also to complete some parts of the Form 104.
5. The Form 104 was then sent to the police with a request for it to be completed, thereby providing an opinion as to whether the death was accidental, suicidal, homicidal, or undetermined, and then returned to the CSO.
6. On the basis of this opinion and the supplementary information on the Form 104, Form 102, and the coroner's certificate, the detailed cause of death was then assigned in accordance with the ICD guidelines.

Inquested Deaths in 2002

According to the CSO database, there were 1,815 inquested deaths in 2002, 1,709 (94%) registered "on time" (i.e., in 2002 or 2003) and therefore included in routine mortality statistics, and 106 (6%) registered late (in 2004) and therefore not included in routine mortality statistics. Late registration in 2004 therefore caused a 6% underreporting of external causes of death. The proportion of deaths underreported due to late registration varied by cause of death ($\chi^2 = 31.32$, $df = 8$, $p < .001$) from 2% for homicide, 4%

for suicide, 5% for accidental deaths, and 12% of deaths classified as of undetermined intent.

Form 104 Reporting System

The Form 104 database arising from the study contained 1,798 entries. The extent to which entries in the Form 104 database matched those in the CSO database is illustrated in Figure 1. Overall, the CSO were in receipt of appropriately completed forms for 91% of the deaths referred to in either database.

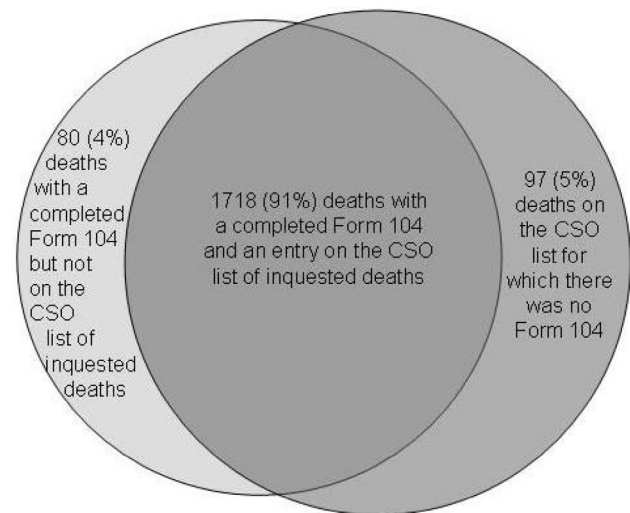


Figure 1. Matching of 1,798 completed Forms 104 and 1,815 Central Statistics Office (CSO) records of inquested deaths.

Of the 80 deaths that had a completed Form 104 but were not on the CSO list of inquested deaths:

- 29 (36%) had resulted in an inquest, but not according to the information held by the CSO;
- 29 (36%) occurred in 2002 according to the Form 104, but occurred in another year according to the information held by the CSO;
- 17 (21%) had Forms 104 completed inappropriately as there had not been an inquest;
- 5 (6%) deaths had no reference information on the completed Form 104 and therefore could not be matched to CSO records.

The 97 deaths on the CSO database of inquested deaths for which no completed Form 104 was received comprised:

- 71 (73%) that resulted in an inquest though no completed Form 104 was received;
- 26 (27%) that did not result in an inquest, so that no completed Form 104 should have been expected.

Whether a completed Form 104 was received in respect of a death on the CSO databases of inquested deaths varied

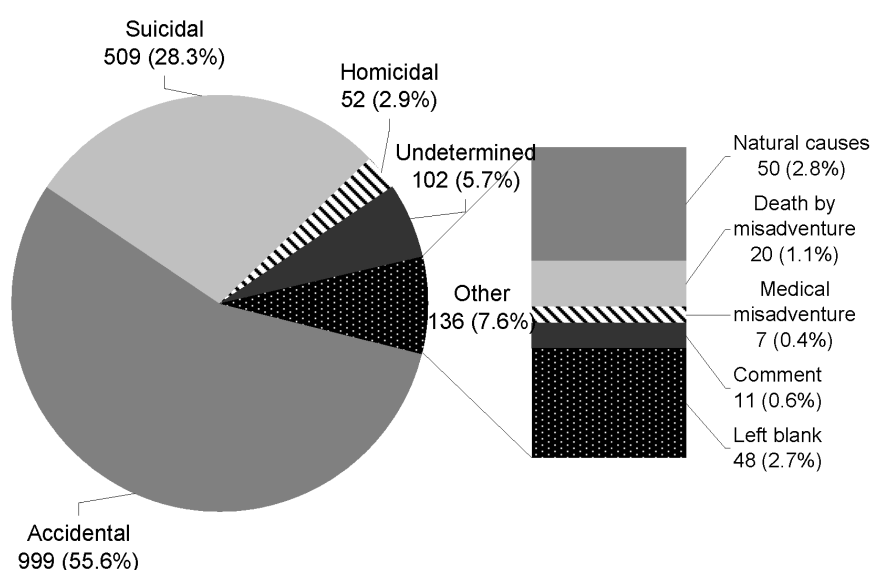


Figure 2. Opinion of cause of death indicated by police officer who completed Form 104.

Table 1. Agreement between police officer opinion of cause of death and cause assigned by the Central Statistics Office (CSO)

		Cause of death assigned by the CSO					Total
		Accident	Suicide	Undetermined	Homicide	Natural	
Police opinion	Accidental	863 (90.2%)	1 (0.1%)	7 (0.7%)	0 (0%)	86 (9%)	957 (100%)
	Suicidal	4 (0.8%)	485 (98.0%)	5 (1.0%)	1 (0.2%)	0 (0%)	495 (100%)
	Undetermined	15 (15.6%)	3 (3.1%)	52 (54.2%)	0 (0%)	26 (27.1%)	96 (100%)
	Homicidal	3 (6.3%)	0 (0%)	2 (4.2%)	43 (89.6%)	0 (0%)	48 (100%)
	Other	37 (30.3%)	3 (2.5%)	10 (8.2%)	0 (0%)	72 (59.0%)	122 (100%)
	Total	922 (53.7%)	492 (28.6%)	76 (4.4%)	44 (2.6%)	184 (10.7%)	1718 (100%)

by broad cause of death ($\chi^2 = 96.31$, $df = 4$, $p < .001$). Suicide was recorded as the cause in 29% of deaths with a Form 104 compared to just 5% of the deaths without a completed Form 104 (i.e., without a police opinion of the cause of death). Either suicide deaths were associated with a higher rate of returned forms or suicide was underrecorded among deaths without a form.

Cause of Death Recorded

On more than half of the Forms 104 (56%), the opinion of the police officer was that the death was accidental, almost 30% were suicides, 3% homicides, and 6% undetermined (Figure 2). Neither of these four options was selected by the police officer in 136 cases (8%); here, the police officer had noted that the death was either by natural causes or by

misadventure (medical or otherwise) or had left the item blank.

Based on the 1,718 deaths with a completed Form 104 and an entry on the CSO database of inquested deaths, there was a high level of agreement (88.2%) between the police officer's opinion and the broad cause of death assigned by the CSO (Table 1). The highest level of agreement related to suicide deaths. Of the 495 deaths thought by the police officer to be suicide, 485 (98%) were so recorded by the CSO.

Time to Inquest and Registration

Almost one in five (18%) inquests took place within 3 months of the death, almost half (48%) within 6 months, almost three-quarters (71%) within 9 months, and 85%

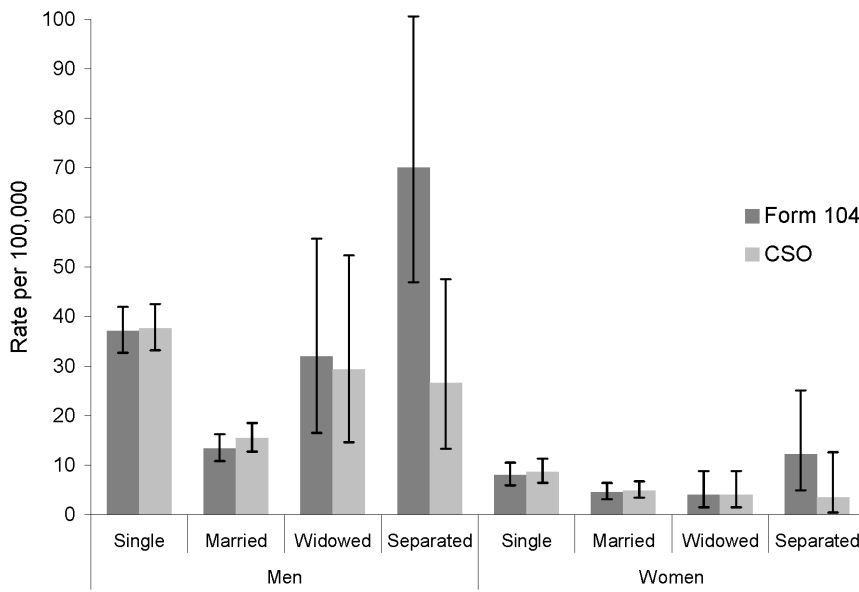


Figure 3. Male and female suicide rate by marital status as recorded by Form 104 and CSO.

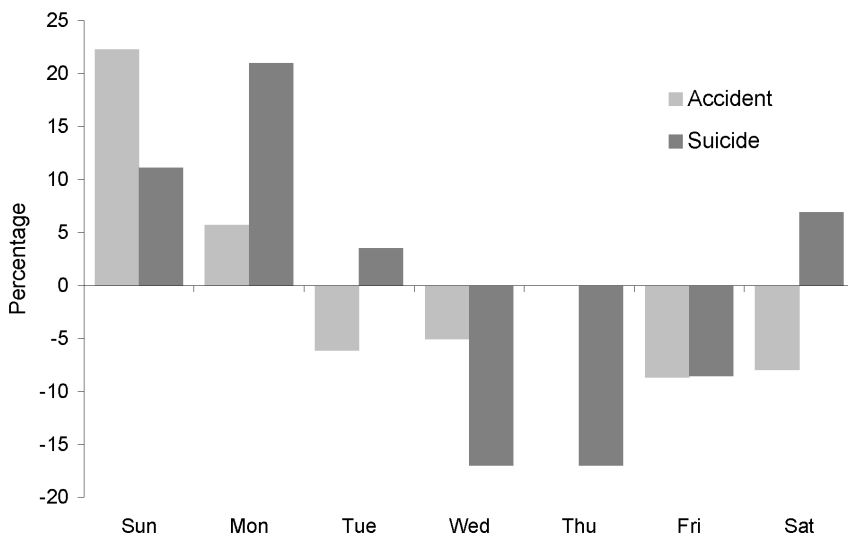


Figure 4. Percentage difference between observed and expected number of accidental and suicidal deaths by weekday.

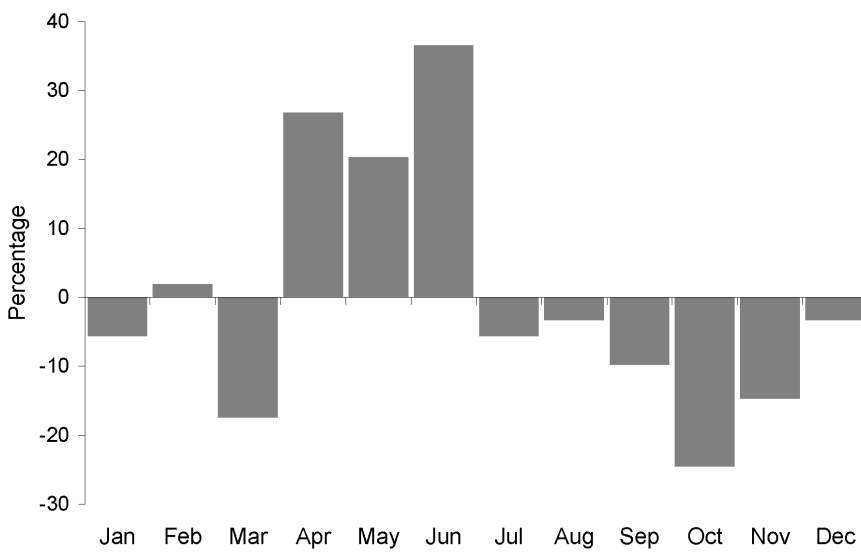


Figure 5. Percentage difference between observed and expected number of suicide deaths by month.

within 1 year. Time to completion of inquest varied significantly by broad cause of death ($\chi^2 = 79.17$, $df = 16$, $p < .001$). More than 12 months elapsed before the inquest in 8% of suicide deaths, 15% of homicides, 16% of accidental deaths, and 27% of undetermined deaths.

Data Completeness

Core reference information and information relating to the death were recorded on virtually all forms. There was also a high level of completeness with respect to the sociodemographic characteristics of the deceased, particularly on age (96%), marital status (99%), and employment status (96%), though less so on domestic living arrangement (88%) and occupation (76%). There was a low level of completeness with respect to medical history and contributing factors, provided in just 35% and 16% of the forms examined, respectively. Forms relating to suicide deaths more often contained information relating to medical history (54%) and contributing factors (34%).

Data Inconsistencies

One of the most notable inconsistencies related to the year of death. For 4.5% of the deaths under study, the year of death on the completed Form 104 differed from that on the CSO database. The coroner's certificate was the source of information for the CSO database.

Based on the 1,718 deaths with a completed Form 104 and an entry on the CSO list of inquested deaths, it was found that the marital status recorded on the form was consistent with that on the CSO database in 1,630 (95%) cases. Most inconsistencies related to the marital status "separated": 94 persons were recorded as separated on Form 104, of whom only 35 (37%) were so recorded by the CSO, half (47, 50%) being recorded as married. The coroner's certificate was the source of the marital status recorded in the CSO database.

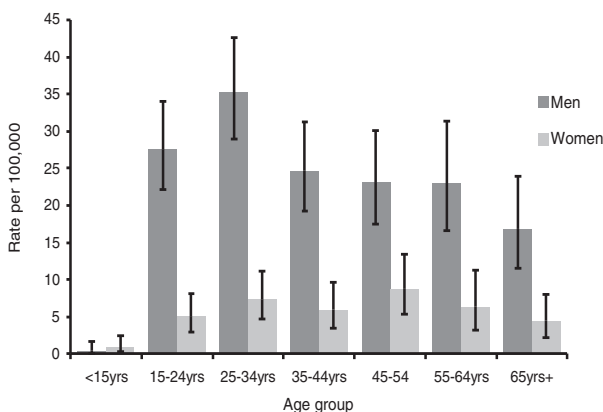


Figure 6. Male and female suicide rate by age group.

There was a marked difference in the suicide rate of separated men and women depending on whether it was derived using marital status recorded on Form 104 or that recorded in the CSO database (Figure 3). Based on the latter, separated persons had a marginally lower suicide rate than single or widowed persons, whereas based on the former, their suicide rate was about three times higher and by far the highest of the marital status groups.

Form 104 Data and Incidence of Suicide

Variation by Day and Calendar Month

An above-average number of inquested deaths occurred on Sundays and Mondays (Figure 4): Accidental deaths had their peak on Sundays, whereas suicide deaths peaked on Mondays. For each, the rate was at least 20% higher than expected on these days. Suicide deaths were least common on Wednesdays and Thursdays, with 17% fewer deaths than expected.

The occurrence of suicide deaths in 2002 showed greater monthly variation than other causes of death. There were 27%, 20%, and 37% more suicide deaths than expected in April, May, and June, respectively (Figure 5). This late spring/early summer peak in suicide rates has previously been reported for Ireland and many other countries. There was a fall in the rate of suicide in late autumn/early winter. Respectively, 10%, 25%, and 15% fewer suicides than expected occurred in September, October, and November.

Age and Sex

The incidence of suicide showed marked variation when examined by age-sex subgroup (Figure 6). The male rate of suicide far exceeded the female rate at each age group over 15 years. The male/female rate ratio was greatest, at 5.5 and 4.8, for the 15–24 and 25–34-year-old age groups, respectively. At 35.3 per 100,000, the peak rate of suicide for men was in the 25–34-year-old age group. Female suicide rates had a bimodal pattern, with one peak in 25–34-year-olds (7.4 per 100,000) and a second in 45–54-year-olds (8.8 per 100,000).

Domestic Living Arrangement

The risk of suicide associated with the three common domestic situations of living alone or with parent(s) or partner is illustrated in Figure 7. For men and women, living alone was associated with a marked increase in the rate of suicide, whereas living with a partner was associated with reduced rates. The rate of suicide in men living with their parent(s) (30.5 per 100,000) was more than twice that of men living with a partner (13.6 per 100,000), whereas the rate for men living alone was five times higher (67.1 per 100,000). The

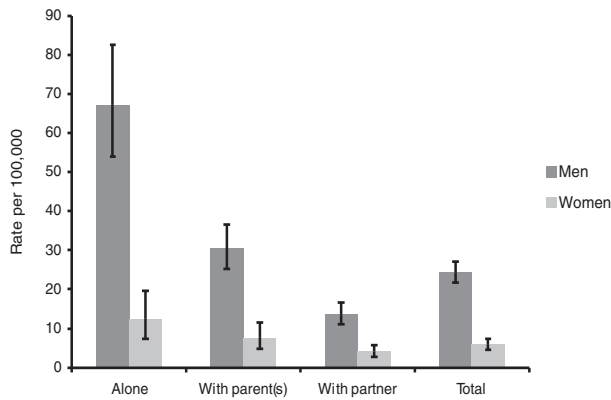


Figure 7. Male and female suicide rate (persons aged over 15 years) by domestic living arrangement.

suicide rate for women living with their parent(s) (7.6 per 100,000) was almost double that of women living with a partner (4.0 per 100,000), whereas women living alone had a suicide rate that was three times higher (12.4 per 100,000). This indicates that living with a partner was associated with a greater reduction in suicide rates among men than women.

Employment Status

There were 365 men and 88 women aged 15–64 years who were indicated to have died by suicide in 2002. For both men and women, unemployment was associated with a greatly increased rate of suicide (Figure 8). Unemployed men had a suicide rate (88.8 per 100,000) that was almost four times higher than the rate for men in employment (23.9 per 100,000). The suicide rate of unemployed women (27.1 per 100,000) was five times higher than that of women in employment (5.2 per 100,000). Women engaged in home duties had a similar suicide rate (7.2 per 100,000) to the employed.

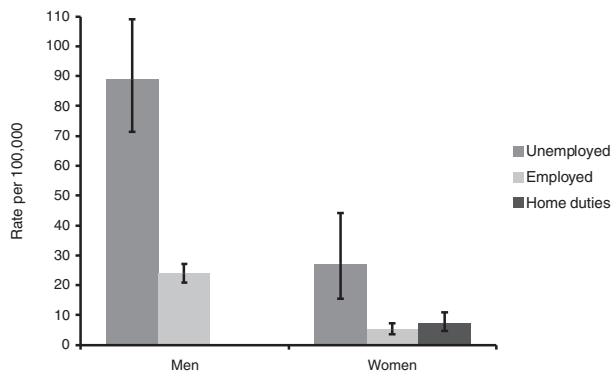


Figure 8. Male and female suicide rate (persons aged 15–64 years) by main employment status.

Discussion

This study provides a unique description of the inner workings of a national system for recording and classifying suicide statistics. The system in Ireland involved a paper-based sequence of data transcription and transfer between police, coroners, registrars, and officers of the CSO. It introduced some inconsistencies in the data recorded, a problem previously mentioned in the Irish context (McGovern & Cusack, 2004). Human error in the transcription of data was likely to have been the cause of these inconsistencies. Most data transfer between the agencies involved in the Irish death registration system is now done electronically, a measure that should eradicate inconsistencies introduced by human error.

The study uncovered an interesting inconsistency relating to the marital status of the deceased. While the numbers involved were not large, there were more than twice as many separated persons according to Form 104 data as per the CSO data, which generally had recorded their marital status as married. The source of the CSO marital status data was the coroner’s certificate. It appeared that persons legally married but separated from their spouse were generally classified by coroners as married and by the police officer completing Form 104 as separated. Heretofore, there has been no evidence of elevated suicide rates among separated persons in Ireland. Separated persons had a three times higher suicide rate when calculated based on the Form 104 recorded marital status, identifying them as at significantly increased risk relative to any other marital status group. Studies in many countries have examined suicide rates by marital status (Griffiths, Ladva, Brock, & Baker, 2008; Lorant, Kunst, Huisman, Bopp & Mackenbach, 2005; Masocco et al., 2008). Definitional differences in relation to marital status may impact the results and comparability of such studies and should be investigated.

Inherent to the Irish inquest system is the issue of late registrations, which on the basis of the present study contributed to a 4% underreporting of the number of suicides in 2002. The length of time to inquest was likely to be the main contributor to registration delay. For 15% of the inquested deaths that occurred in Ireland in 2002, at least 12 months elapsed before the inquest. The move from a paper-based system to an electronic system of registering deaths in Ireland in recent years may not help to reduce late registrations unless the time between death and inquest is reduced.

Ireland operates a coronial system as in the UK and Australia. However, Ireland differs by seeking a police opinion of the nature of the death. The importance of the police officer opinion in determining the cause of death recorded by the Irish CSO was clearly evident from the study’s findings. Of the deaths indicated by the police officer who completed the form to be accidental or homicidal, 90% were eventually assigned the equivalent cause of death. Of the 495 deaths indicated by the police officer to be suicides, 485 (98%) were so recorded by the CSO.

However, the present study indicates that a system including the police as an information source may not yield useful data in some domains. The data items on Form 104 relating to medical history and psychosocial factors were significantly underrecorded to the point that they were of little or no value. Varying completeness of data relating to inquested deaths in Ireland has previously been noted (McGovern & Cusack, 2004). Nevertheless, the study derived valuable findings – some for the first time in the Irish context – from the data compiled to a high degree of completeness. The study highlighted the strong temporal pattern of suicide both by day of the week and month of the year as has been reported previously (Corcoran et al., 2004) and for the first time showed an elevated risk of suicide associated with marital breakdown, living alone, and unemployment. The study also produced a series of recommendations, some of which are highlighted here.

The study limited itself to inquested deaths that occurred in 2002 and were registered in 2002, 2003, or 2004. It did not aim to quantify the extent to which suicide deaths had been misclassified as other causes of death, which was of interest but would have required a broader and more extensive examination of the death registration and cause of death classification system. More recently, changes were made to the death registration and cause of death determination system and specific efforts were made to improve the Form 104 reporting system, particularly relating to the traceability of the forms and the timeliness of their return. This should be borne in mind when considering some of the data limitations highlighted by our study findings. While the suicide recording system has evolved recently, the profile of individuals whose deaths result in an inquest is unlikely to have changed significantly since 2002. Therefore, the findings from the analysis of the Form 104 data are likely to be valid for more recent years.

In line with recommendations in the Irish National Strategy for Action on Suicide Prevention (Chambers, Arensman, Connolly, Corcoran, & Corcoran, 2005), another system to collect and collate data on the medical and psychosocial characteristics of individuals whose deaths lead to inquest is currently being piloted. This system aims to (1) better define the incidence and pattern of suicide in Ireland, (2) identify and better understand the causes of suicide, (3) identify and improve the response to clusters of suicide, filicide-suicide, and familicide, and (4) improve provision of support to people bereaved by suicide. The implementation of this system is being conducted in close collaboration with coroners, health care professionals, and bereaved family members, and there will be a structural link with bereavement support services.

Researchers are generally frequent users of the mortality statistics produced by the national statistics offices. While they usually have no role to play in the system that produces the statistics, they may also have little or no understanding of how the system actually operates, whether there are deficits within the system, or whether the system has changed over time. These factors may lead to a misinter-

pretation of trends and patterns in the incidence of a cause of death, and to incorrect inferences, which in turn may result in the development of ineffective policy and prevention activities. An example of an initiative to address such deficits is the Australasian Mortality Data Interest Group, established to provide a forum for the producers and users of Australian and New Zealand mortality statistics to meet and discuss issues relating to all aspects of mortality data. The need for suicide researchers and suicide-prevention professionals to better understand their national suicide recording systems has been recognized by the International Association for Suicide Prevention (IASP), which has established a task force to compile descriptions of national systems for certifying suicide deaths (http://iasp.info/national_systems_for_certifying_suicidal_deaths.php). The ultimate goal of such work is to promote the establishment of an internationally standardized suicide recording system operating within the ICD system.

Acknowledgments

The study was funded initially by the Irish National Suicide Review Group and subsequently by the Health Service Executive's National Office for Suicide Prevention. Thanks are due to the officers of the Irish Central Statistics Office, in particular Mr. Joseph Keating, for supporting and facilitating the study. Special thanks are also due to Ms. Vera McCarthy of the Irish National Cancer Registry who was seconded to work on the study and to Dr. Harry Comber, Director of the National Cancer Registry, for facilitating this arrangement.

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