

Methods and Data Sources

Data

Tables containing the number of suicide deaths and intentional self-harm hospitalisations across population subgroups are included in the Appendices.

Population denominator

Source

Denominator data were sourced from Statistics New Zealand (SNZ).

Period of data

For the moving average mortality rates (1921–2003) in the historical context section the populations outlined below were used as denominators. The population figures were interpolated between the SNZ De Facto census populations from 1921–1936 using an optimal polynomial spline (SAS statistical software, procedure TPSPLINE). From 1937–2003, the estimated national population as at 30 June from SNZ was used.

For the remainder of the report for the hospitalisation (1978–2004) and mortality (1983–2003) moving average rates the straight-line Interpolated 30 June Census populations were used as denominators. The linear interpolation is performed between Census Usually Resident (UR) populations for each demographic group. These populations are based on the SNZ Census UR populations from 1981, 1986, 1991, 1996, 2001. For example, if the 1996 UR Census population for Māori, Male, 15–19 years in Census Area Unit 1 (CAU1) is 500 persons and the 2001 UR Census population is 1000 in CAU 1 for this same population subgroup, then the interpolated populations for 1997–2000 are 600, 700, 800 and 900 respectively. This method is continued to extrapolate beyond 2001. If the interpolation or extrapolation is less than zero the population is set to zero. It should be noted that this method does not account for the exponential nature of population increases or decreases, through events such as increased immigration, over particular time periods.

Suicide deaths

Source

Suicide data were sourced from the New Zealand Health Information Service (NZHIS).

Definition

Classification of a death as suicide is subject to a coroner's inquiry, and only on completion of an inquest can a death be officially classified as suicide. In some cases, the inquest will be heard two-to-three years after the death, occasionally even later, particularly if there are other factors surrounding the death that need to be investigated first. Throughout this publication suicide deaths are referred to as suicides, deaths or *n* deaths per 100,000 population.

Period of data

The period for which there is a more detailed presentation of suicide death data is 1983–2003. However, the data for the most recent year (2003) were provisional at the time of publication because a small number of deaths (18) were still subject to coroners' findings, for which a cause of death had not been assigned. Since the preparation of this report, final 2003 data have been published by NZHIS in the publication *Mortality and Demographic Data*,¹ which reports that total 2003 suicide-related deaths changed by two from 516 to 518. This change has not been incorporated in the mortality graphs and rates presented in this document.

Ethnicity classification

The ethnic breakdown for the total population was Māori, Pacific peoples, Asian peoples and European/Other. Trends in mortality by ethnicity for the total population have only been presented from 2000 onwards. New Zealand Census–Mortality Study (NZCMS) adjustors can be applied to mortality counts from 1996–1999 to address the undercount for Māori and Pacific peoples, but adjustors are not available for Asian peoples. It is not valid to compare adjusted (Māori and Pacific) and unadjusted (Asian) mortality figures. From 2000 onwards, comparisons across all the ethnic groups are possible because adjustors are not necessary.

The pre-1996 undercounting occurred because ethnicity was recorded differently on death registration forms and in the Census. Ethnicity was based on a biological concept (ie, percentage of blood) on death registration forms, and a sociocultural concept (ie, cultural affiliation) in the Census. From September 1995, the death certificate included a comparable question to the self-identified ethnicity question in the 1996 Census, including allowing for multiple ethnic identities. Completion of the ethnic field on the death certificate also became mandatory at this time.

For further discussion on inconsistencies in ethnicity collection, refer to *Decades of Disparity: Ethnic Mortality Trends in New Zealand 1980–1999*² (Ajwani et al 2003).

For breakdowns of ethnic group by sex or age group, the ethnic breakdown used was Māori/non-Māori because small numbers of deaths did not allow the calculation of robust rates for further ethnic groups. Because adjustors are available from 1996–1999, the trends are presented from 1996 onwards (the first three-year moving average being 1996–1998).

¹ <http://www.nzhis.govt.nz/publications/mortality.html>

² <http://www.moh.govt.nz>

Hospitalisation for intentional self-harm

Source

Hospitalisation for intentional self-harm data were sourced from NZHIS.

Definition

In New Zealand, hospitalisation for intentional self-harm is a recognised proxy measure for attempted suicide that calculates the number of people who intentionally harmed themselves and were admitted to hospital. The motivation for intentional self-injury varies but for a large proportion of people who present in this way there is a desire to end their life.

In this publication, the hospitalisation rate for self-harm is defined as the rate of first admission (inpatient or day patient) for an intentional self-harm event, using the ICD-9 and ICD-10 classification system, who may or may not later die in hospital (about 30 people per year later die in hospital). This rate is expressed as hospitalisations or *n* hospitalisations per 100,000 population.

The numbers and rates reported in this publication are based upon current best practice methods for injury statistics and are consistent with the method used in the New Zealand Injury Prevention Strategy Outcomes Indicators Project (Cryer et al 2004), which includes suicide measures for death and hospitalisation. The rates of hospitalisation reported in this publication are not comparable with rates reported in the previous *Suicide Facts* and *Suicide Trends* publications because 'unfiltered' discharge data were used. This can result in an overcount of intentional self-harm events because any single intentional self-harm event may result in multiple admissions to a hospital (or a transfer between hospitals) to treat the injury. These re-admissions and transfers were previously counted as separate intentional self-harm events. This method is inconsistent with best practice for calculating injury statistics in New Zealand and internationally.

People who intentionally harm themselves but are not admitted to hospital are not included; for example, those people treated by a general practitioner or an emergency department, but not admitted to hospital. People who are hospitalised several times for the same intentional self-harm injury event are only counted once. For example, if a person was admitted to a hospital medical ward and then transferred to a psychiatric unit for one intentional self-harm event, these two admissions would be linked and the event counted once only for this individual. People who are hospitalised for further separate intentional-self-harm events are counted once for each event.

Period of data

The period for which hospitalisation data is presented is 1978–2004.

Hospitalisation statistics have been collated in New Zealand since the late 1800s, with electronic files available from 1971 onwards, although only easily accessible from 1978. However, data before 1978 cannot be presented because of changes in the way the data have been reported and collected.

Ethnicity classification

The ethnic breakdown for the total population was Māori, Pacific peoples, Asian peoples and European/Other. The data sets used to classify ethnicity were mortality (all causes), hospitalisation, cancer registration and a recent copy of the National Health Index (NHI) for the whole time period.

To improve the accuracy of ethnicity classification, an 'ever' ethnic indicator was used across the time period. Individuals were linked across data sets obtained from NZHIS. Each record in these data sets has three ethnicity fields. If Māori was coded as one of the ethnic groups in any ethnicity field over the time period, individuals were classified as Māori. Using prioritisation of ethnicity, the same rule was applied to Pacific and then Asian ethnic groups. The remaining people were determined to be European/Other.

For breakdowns of ethnic group by sex or age group, the ethnic breakdown used was Māori/non-Māori because small numbers of hospitalisations did not allow the calculation of robust rates for further ethnic groups.

International Classification of Disease (ICD) codes

Classifications used are those current during the period data are presented for. In this period, the coding system changed from ICD 9 to 10. From 1983 to 1999, ICD-9 codes used for mortality and hospitalisation were E950–E959. Since then, the ICD-10 codes used were X60–X84.

ICD-9 code	ICD-10 code	Description
E950	X60–65, X68–69	Poisoning by solid or liquid substances
E951, E952	X66, X67	Poisoning by gases and vapours, including household gases and motor vehicle exhaust
E953	X70	Hanging, strangulation and suffocation
E954	X71	Drowning
E955	X72–X74	Firearms and explosives
E957	X80	Jumping from a high place
E956, E958, E959	X75–X79, X81–84	Other method – includes cutting and piercing, late effects of self-inflicted injury and other methods such as lying in front of a moving object (eg, train)

Caution should be exercised when comparing data for hospitalisation for intentional self-harm between years because of changes in coding and treatment practices. In 1999 and 2000, New Zealand introduced the ICD-10 classification of disease for morbidity and mortality statistics. This resulted in a modified inclusion criterion for the diagnosis of intentional self-harm. From 2000 to 2001, psychiatric discharges, previously excluded from the data, were included for the first time, contributing to an increase in the number of discharges recorded. In addition, more people now receive treatment for overdoses on an outpatient basis; such cases would previously have been included in the hospitalisation data.

Some of the regional differences in hospitalisation for intentional self-harm rates between District Health Boards (DHBs) may be because of different practices in reporting, coding and patient management. This includes the use of different definitions for a hospital admission at different DHBs.

Reporting changes over time

Caution should be exercised when comparing data for hospitalisation for intentional self-harm between years because of changes in reporting practices across New Zealand and by individual DHBs. To follow is a summary of the major relevant changes.

In 1987, day patients started being reported and, from 1992, all day patients were reported, leading to an increase in hospitalisations for intentional self-harm. From July 1995, more than one cause of hospitalisation could be reported per admission and there was a further increase in hospitalisations. In 1998, the number of causes increased further, but this did not seem to have any practical effect on the data.

In December 1998, some DHBs started considering anyone present in the Emergency Department (ED) for three hours as an admission and began reporting them in their hospitalisation data. This led to a sharp increase in numbers because minor, intentional self-harm cases previously treated and sent home were included as hospital admissions. After a year, this definition was made consistent, with the national definition of an admission being at least three hours of *treatment* not three hours of *waiting*.

From 2000 to 2003, more DHBs began to report patients present at ED as hospital admissions (previously not reported). This led to a further increase in the hospitalisation rate.

Statistical methods

Suicide rates and ratios

The *rate* of suicide refers to the frequency with which suicide occurs relative to the number of people in a defined population and within a defined time period.

Rate ratios compare the suicide rate of one population group with the suicide rate of another population group.

Age-standardised rates or ratios

Age-standardised rates are rates that have been adjusted to take account of differences in the age distribution of the population over time or between different groups (eg, different ethnic groups).

Age-standardised rate ratios are the ratio of two age-standardised rates.

Age-standardisation was undertaken with the direct method, using the World Health Organization (WHO) standard population (Ahmad et al 2000). For a copy of the WHO standard population, see Appendix 1. The age-standardised rates in this publication are

not comparable with those in previous annual publications of suicide data (*Suicide Facts* publications) because the data were standardised to the Segi population.

Table 1: Differences in methods between the current publication and *Suicide Facts: Provisional 2003 All-Ages Statistics*

Method	Suicide Facts: Provisional 2003 All-Ages Statistics	Current publication	Reason for different method
Standard population	Segi's	World Health Organization	Public Health Intelligence best practice standard
Age-standardised rates for suicide	Annual	Three-year moving average	More robust for small numbers
Hospitalisation data	Unfiltered discharge data	Rate of first admission	Best practice for injury statistics

Age-specific rates

An *age-specific* rate is the rate of suicide for a particular age group and refers to the frequency with which suicide occurs relative to the number of people in a defined age group.

Three-year moving average

Three-year moving average age-standardised rates are the average age-standardised rates for three-year periods (ie, 1983–1985, 1984–1986, 1985–1987 and so on). The three-year moving averages are plotted on the midpoint year. For example, the 2001–2003 three-year moving average is plotted on the year 2002. Three-year moving averages are used because rates based on individual years often contain small numbers and therefore tend to exhibit pronounced fluctuation.

Because the three-year moving averages are plotted on the midpoint year, the rate for the last year of the time period analysed is not shown on the figures. For suicide mortality, data are used from 1983 to 2003, so three-year moving averages are presented for 1984 to 2002. For intentional self-harm hospitalisations, data are used from 1983 to 2004, thus, three-year moving averages are presented for 1984 to 2003.

Three-year moving averages allow for underlying trends over time to be more clearly illustrated. Moving averages also provide a more reasonable level of certainty as to the level of change than would a rate for only one year (Ministry of Transport 2005), while being short enough for important differences in rates over time not to be obscured.

New Zealand Deprivation Index

The New Zealand Deprivation Index 2001 (NZDep2001) was used as the key indicator of socioeconomic status (Salmond and Crampton 2002). It is an area-based index of deprivation based on Census 2001 variables (eg, income, house ownership and educational qualifications). NZDep2001 was used for every time period because deprivation was not measured in the 1980s. It is therefore assumed that an area's deprivation in the 1980s is relative to its NZDep score in 2001. NZDep2001 scores were divided into five quintiles, Quintile 1 being the least deprived and Quintile 5 the most deprived. Because of data collecting procedures, data on non-residents of New Zealand are not included in the socioeconomic section.

For further information on the relationship between suicide and social and economic factors, see *Suicide Trends and Social Factors in New Zealand 1981–1999: Analyses from the New Zealand Census–Mortality Study* (Collings et al 2004) and *Suicide Rates in New Zealand: Exploring associations with social and economic factors* (Ferguson et al 2002).

District Health Board boundaries

Consistent geographical boundaries, based on the 2001 Census area units (CAUs) were used for mortality and hospitalisation data from 1978 to 2004. These represent the CAU of domicile for each case (death or hospitalisation). For mapping purposes, the constituent CAUs were aggregated to each DHB boundary.