

Changes in the age pattern of New Zealand suicide rates

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ABSTRACT

AIMS: It is timely to examine changes in male and female suicide rates across the age range in New Zealand, comparing them to some of the changes recorded in Australia.

METHOD: Data regarding suicide and population figures in New Zealand and Australia were obtained. The suicide rates of different age-groups in the two countries were calculated and compared. Data concerning 'open verdicts' were also obtained.

RESULTS: The age patterns of suicide rates in New Zealand and Australia have changed markedly and similarly. Suicide rates of New Zealand males in their twenties increased threefold between the 1960s and 1990s, with a fall since then. Nevertheless, the 2009–13 youth suicide rates in New Zealand were double the corresponding rates in Australia. Since 1979–88 a decrease in suicide rates of men and women aged 60–79 has been even greater than in Australia. The Māori suicide rate is high in young men but almost zero in old age.

CONCLUSIONS: The persistently high suicide rate of New Zealand youths (Māori much more than non-Māori) remains of concern. The rate is equally high among indigenous young Australians. There has been a welcome decrease in late-life suicide rates in New Zealand and Australia.

During the last 65 years, over 28,000 deaths in New Zealand (population currently 4.57 million) have been recorded as suicides.

An extraordinary change in the age pattern of suicides over recent decades has been reported from New Zealand,¹ Australia² and other countries, though not always in the same direction.³ Socio-cultural variation may largely explain differences in age and gender patterns of suicide between countries, such as those between New Zealand and China.⁴ New Zealand and Australia have much in common: there is good reason to examine whether changes in New Zealand suicide rates in recent years have been similar to those observed in Australia, and to discuss possible explanations for changes found in suicide rates of particular socio-cultural or age groups. Variations in age patterns of suicide may help identify factors that influence suicidal behaviour.

Method

Statistics regarding deaths recorded as suicides in New Zealand and Australia, together with population figures, were made available, respectively, by the New Zealand Health Information Services (Ministry

of Health) and the Australian Bureau of Statistics (ABS). Data for a series of 10-year periods extending from 1949 to 2008, and for 2009–2013, were provided in relation to five-year age groups of males and females (15–19 years up to 80–84 years, and then 85 years or more). Rates of suicide were calculated from five-yearly national census data. New Zealand's 2013 suicide statistics were provided by the New Zealand Ministry of Health in July 2016. For earlier years, information regarding deaths where findings did not allow a verdict of suicide, and that were classified as deaths due to injury but "undetermined whether accidentally or personally inflicted", was also obtained.

Graphical representations of differences in suicide rate were prepared in order to facilitate comparisons across the age-range, between genders, over time and between New Zealand and Australia.

Results

Prior to 1988, comparatively few people in New Zealand were aged over 85 years. The number of suicides by males in this age-group ranged from four to eleven per five-year period, and female numbers

ranged from one to five (average 2.5). Therefore, in Table 1, data for those aged 80 years or more were amalgamated. In the five-year periods between 1989 and 2013, the suicide rate per 100,000 of New Zealand males aged 85 years or more was (successively) 31.5, 30.4, 28.4, 36.3 and 28.2.

Examination of Figure 1 and of the fluctuations in rate shown in Table 1 reveal remarkable changes in the age patterns of male and female suicide in New Zealand. Comparable changes have occurred in Australia.

In both New Zealand and Australia in the 1950s and 1960s, the suicide rate of *males* was low in their teenage years, but was progressively higher across the age-range to reach a peak in old age. During the following three decades, the suicide rate of New Zealand males in their late teens and early twenties rose progressively and substantially, reaching a peak in the 1990s three times higher than it had been two decades earlier (Table 1, Figure 2). There was a comparable but smaller increase in suicide rates of young Australian males (see Figure 3). Meanwhile, the suicide rate of New Zealand men in their early thirties

increased twofold (Table 1). Since the 1980s the suicide rate of older males has fallen more than twofold. The lowest rates among adult New Zealand males in the new century have been in those aged 60 to 79 years (Figures 4 and 5, Table 1). In Australia the lowest adult male rates have been in the 60 to 74 years age group (Figures 4 and 5). Tables showing Australian rates during 2004–13 have been published.⁵

The suicide rate of young New Zealand *females* increased during the last half-century, while suicide rates at age 40–49 years remained fairly steady (Table 1, Figures 1 and 3–5). However, suicide rates of all five-year age groups of women aged 50–54 to 75–79 years have fallen considerably over recent decades, the drop since the 1950s being threefold or more. The suicide rate of women aged over 80 years has changed little across the decades (Table 1); it has been lower than the rate among young women for over twenty years.

The suicide rate among the Māori population, male and female, has remained at about 1.6 times the rate in the non-Māori population over recent years. The mean suicide rates per 100,000 among Māori aged

Table 1: A comparison of suicide rates of five-year age-groups of males and females in New Zealand, in six decades and in 2009–13.

Five-year age-groups	1949–1958		1959–1968		1969–1978		1979–1988		1989–1998		1999–2008		2009–2013	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
10–14	0.6	0	0.4	0.2	1	0.3	1.7	0.6	3.3	1.3	1.3	1.2	2.5	2.5
15–19	5.5	0.7	3.6	1.7	8.6	3.1	15.4	4.2	30.3	9.2	21.8	10.1	24.8	12.6
20–24	9.3	2.2	10.7	4.3	16.1	5.8	28.3	7.7	50.7	9.4	34.2	9.3	29.7	10.2
25–29	12	5.1	11.8	3.7	13.6	7.2	23.4	7.7	41.1	8.1	33.6	8.7	21.4	8.0
30–34	14.4	4.3	14.5	4.7	13.7	6.3	19.8	7.1	30.4	7.5	30.4	7.1	22.9	7.5
35–39	14.4	4.5	18.1	6.1	16	7.2	20.6	6	27.1	5.1	27.4	9.3	24.0	6.8
40–44	16.5	9	22.4	8.7	20.7	9.1	20.5	7	23	8.5	23.1	7.7	25.2	6.2
45–49	22.3	7.8	26.9	12	23.5	11	23	7.5	25.5	7.8	21.6	6.5	26.5	7.6
50–54	30.4	14	24.5	14.1	21.4	13.5	21.8	11.2	21	9.1	20.4	7.1	22.1	8.7
55–59	33.2	14.8	27.4	17.5	24.5	16.7	25.9	12.2	23.2	6.3	22.5	6.3	20.9	6.7
60–64	26.6	16	28.4	16.1	24.9	16.3	25	9.9	23.8	6.5	16.8	4.7	16.0	5.3
65–69	37.5	11.7	24.2	12.2	24.6	13.8	27.6	8.8	24.6	4.6	14.2	4.7	8.8	3.2
70–74	36.9	11.3	34.3	16.7	31.6	13.5	32.4	11.1	25.8	8.4	16.4	4.9	14.7	1.6
75–79	39.6	8.5	34	8.1	34.1	8.1	38.9	12.8	24.8	5.7	18.8	3.4	16.2	3.9
80+	45.1	5.7	28.3	6.6	34.4	6	41.9	9.5	37	4.4	26.8	6.2	23.7	6.4

Figure 1: New Zealand male and female suicide rates in five-year age-groups, 1949–58 and 1998–2008.

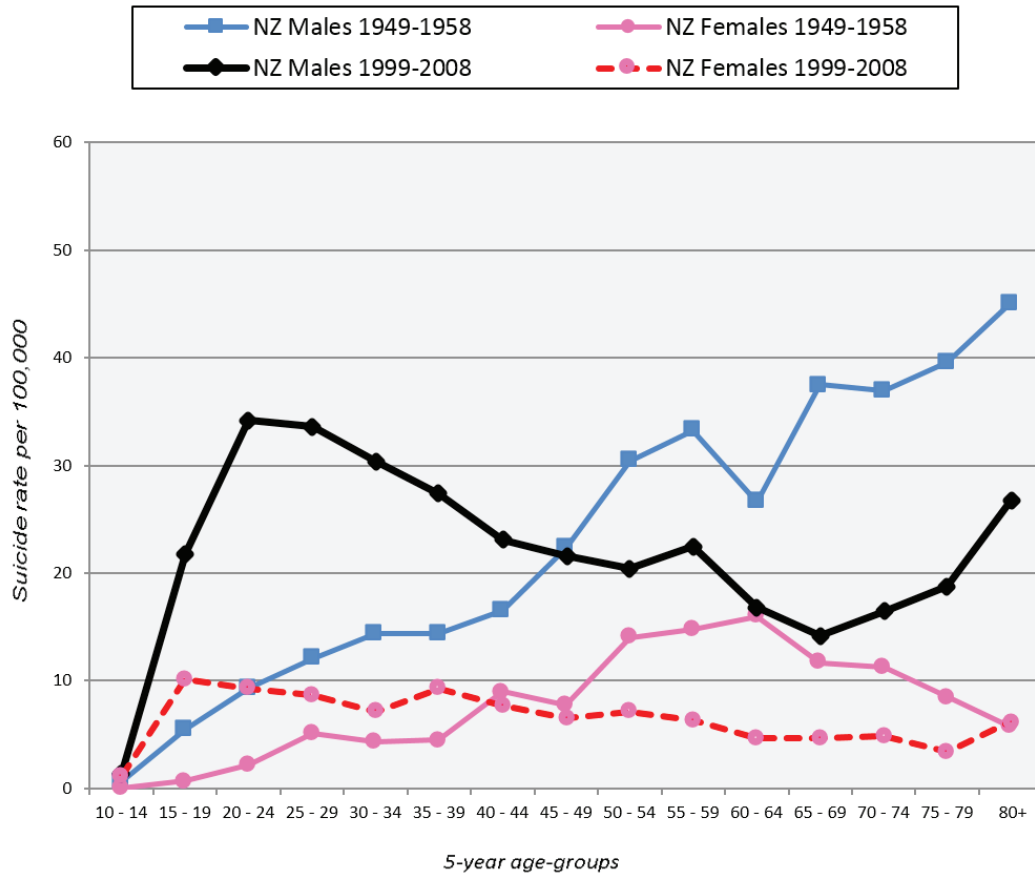


Figure 2: Suicide rates of New Zealand males in five-year age-groups, in the 1950s, 1970s, 1980s and 1990s.

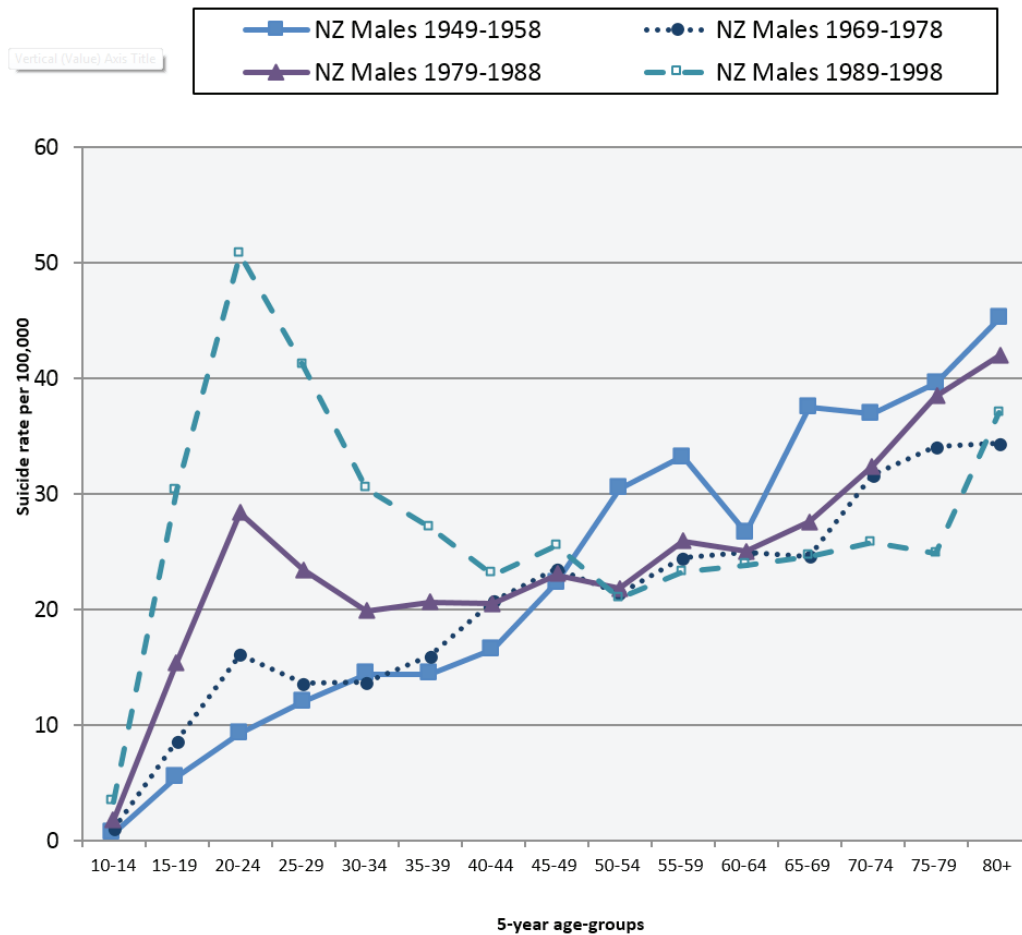


Figure 3: New Zealand and Australian suicide rates per 100,000 in 1989–1998.

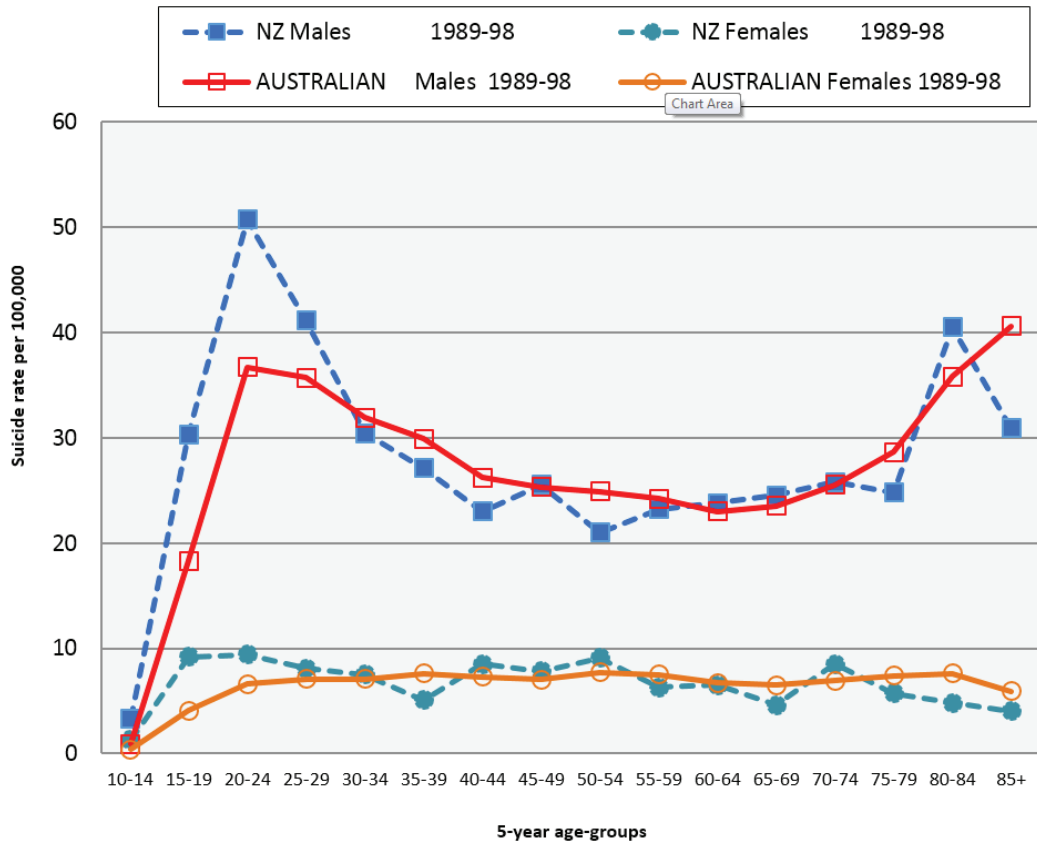


Figure 4: New Zealand and Australian suicide rates per 100,000 in 1999–2008.

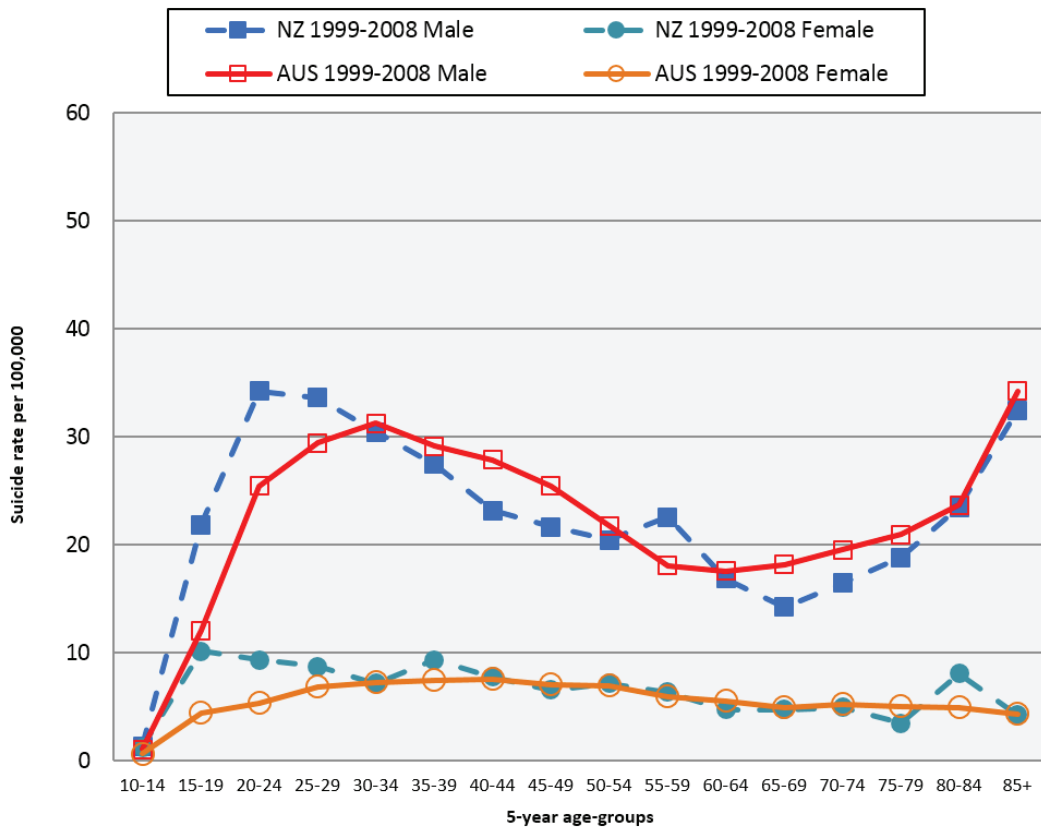
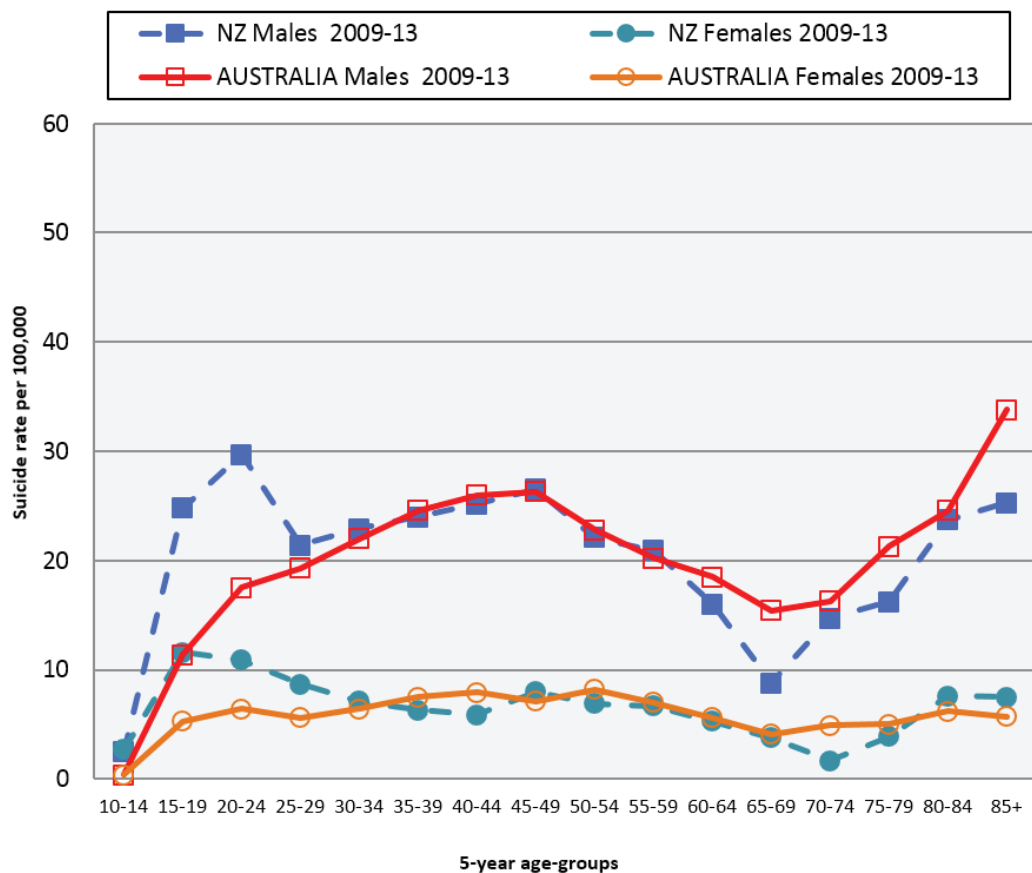


Figure 5: New Zealand and Australian suicide rates per 100,000 in 2009–13.



15–24 years in 2003–2011 were 43.7 (male) and 21.3 (female). In 2012 the Māori and non-Māori rates (age 15–24) were, respectively, 48 (male 57.2, female 38.4) and 17.3 (male 26.2, female 7.7); in 2013 they were 44.5 and 11.8. In 2011–13 (when 14% of the New Zealand population and 6% of Māori were aged 65 years or more), only one of the 326 Māori who died by suicide was aged over 65 years. Of 1,224 suicides in the non-Māori population in the same years, 154 (12.6%) were of people aged at least 65 years.

The ABS provided comparable figures regarding suicide numbers and rates in the indigenous populations (Aboriginal or Torres Strait Islanders) living in mainland Australian states during 2010–15. During this time, 6.9% of suicides were of indigenous people (6.6% in 2015). Of Australians aged 15–24 years who killed themselves, 18.5% of the males and 19.8% of the females were indigenous; their suicide rates per 100,000 in 2010–15 were, respectively, 52.7 and 23.1, compared to 13.7 (male) and 5.5 (female) in the non-indigenous population in that age-group. At age 25–34 the rate per 100,000 was even higher among indigenous

men (60.8) but somewhat lower among women (22.3). Suicide rates of indigenous Australians older than 35 were lower in successive age-groups, except for a small increase among men aged over 60 years. Only 19 (0.6%) of the 2,988 Australians aged over 60 years who killed themselves in 2001–10 were from Aboriginal or Torres Strait Island backgrounds.

The age patterns of suicide rates in New Zealand and Australia in 1989–98, 1999–2008 and 2009–2013 can be compared (Figures 3, 4 and 5). Suicide rates of males in New Zealand and Australia in 1979–88 reached peaks at age 20–24 years (28.0 and 28.4 per 100,000, respectively), and higher peaks in late old age. By 1989–98 the peak male rate of suicide in New Zealand was at age 20–24 years (50.7 per 100,000), much higher than the late life peak (29.4 per 100,000 at 80+ years) (Figure 3); in Australia there was an initial peak in male suicide rate at age 20–24 (36.7 per 100,000), but there was a second, higher peak in very late life (40.6 per 100,000). By 1999–2008 (Figure 4), and even more so in 2009–13, the suicide rate of younger males had decreased in both

countries. In New Zealand the 2009–13 peak male suicide rate was at age 20–24 years (29.7 per 100,000), double the rate recorded among Australian males of the same age; by 2009–13 the early male peak in Australia had shifted to age 45–49 (Figure 5). In 2013, 21% of male suicides in New Zealand were of people aged 15–24; the corresponding percentage in Australia was 16.6%. The suicide rates of indigenous people aged 15–24 in the two countries are similar, but the proportion of Māori people in New Zealand is higher than that of indigenous people in Australia; thus 8.6% of those aged 20–24 in New Zealand are Māori, but only 3.8% of Australians aged 20–24 are indigenous. Because indigenous youth suicide rates are higher, the difference partly explains the higher rate of youth suicide in New Zealand than Australia. The number of suicides of New Zealand females aged 15–24 years in 2013 was 37 (25.9% out of 143), while in Australia it was 93 (14.3% out of 634). In Australia the peak male rate was at age 85+ years in 2013 (38.3 per 100,000), with an earlier peak of 25.7 per 100,000 at age 40–44. The peak suicide rate in late life among New Zealand males in 2009–13 (28.2 per 100,000) was lower than the peak 2009–13 rate recorded among men aged 20–24 (29.7 per 100,000).

In Australia in 2014, 6,460 deaths were deemed to be accidental, with 2,864 deemed as suicides; in 280 cases the cause of death was “undetermined”. Finalised figures for Australia deaths in 2006–8 showed a ratio of 100 suicides to 15.5 deaths with cause undetermined. The rate of deaths with undetermined cause was reported as 1.6 per 100,000. The New Zealand rate for cases similarly coded (Y10-Y34) in 2006–8 was 0.6 per 100,000.

Discussion

It is widely believed that suicide results from a complex interplay of factors, one being psychological distress. Shneidman⁶ argued that suicide occurs when psychache (intensely felt psychological pain) becomes unbearable. The data presented in Table 1 show relatively huge variations in suicide rates. At least part of the variation may be attributable to varying levels and types of stress and consequent mental perturbation (anguish and distress).

In cautioning against the commonly held view that suicide is usually a consequence of mental disorder, Pridmore⁷ pointed to differences between cultures and over time in the age pattern of suicides. For example, he stated that there is no clear difference in prevalence of mental disorder between men and women, and therefore a 3:1 gender difference in suicide rate cannot be explained by a gender difference in the rate of mental disorder. He posited that cultural factors and gender roles are responsible for this robust difference. In China's urban populations, male and female suicide rates are similar,⁴ and the age pattern is very different from that recorded in New Zealand and Australia. Pridmore⁷ accepted that suicide may be the result of a mental disorder or a single socioeconomic stressor (such as a public disgrace), but stated that more often it is the result of a *number* of stressors, one of which may be a mental disorder, together with (for example) unemployment, relationship failure, substance abuse and/or painful emotions such as shame.

This view accords with findings from the present examination of variations in age pattern of suicides. The dramatic rise and fall of suicide rates of young adult males in New Zealand and Australia may well have been related to a changing incidence of mental perturbation (psychache⁶) but maybe also of substance abuse, rather than being due to changes in prevalence of other DSM-5 mental disorders.

Pridmore⁷ commented that New Zealand's suicide rate is greater than Australia's. However, the latest figures show that suicide rates of men aged 25–64 years in Australia and New Zealand are almost identical (Figure 5). The same applies to women aged 30–69 years. The fact that the overall suicide rate is higher in New Zealand than Australia is attributable to the markedly higher suicide rates of New Zealand youths (male and female). As seen in Table 1, suicide rates of those aged between 15 and 39 years rose to a peak in the 1990s. The highest rate was recorded for the male 20–24 age group, whose averaged suicide rate for 1989–1998 was 50.7 per 100,000. Rates for all age-groups younger than 40 years have fallen since then from their peaks, some substantially. However there must be continued concern regarding the relatively high youth suicide

rate in New Zealand versus the much lower corresponding rates in Australia.

Indigenous youth suicide

Suicide appears to be especially a problem among Māori youth. Skegg et al⁸ reported on the high suicide rates in the 1980s of Māori and non-Māori males aged 15–24 years (about 24 and 28 per 100,000 respectively), but with progressively lower rates across the age-range among Māori males, contrasting with increasing rates across the age-range of non-Māori. Striking, even then, was the comparatively high suicide rate of Māori females aged 15–24 years (15 per 100,000), which was more than double that of non-Māori females, though with a steep fall to less than five per 100,000 at 25–34. It was even lower at age 35 to 64, with no suicides of Māori females aged 65 years or more. By 2002, the suicide rate at age 15–24 of Māori males and females had risen, respectively, to 43.7 and 18.8 per 100,000, contrasting with male and female non-Māori rates in the same age-group of 18.0 and 9.1 per 100,000.⁹ Suicide rates of Māori aged 15–24 reached peaks of 57.2 (male) and 38.4 (female) per 100,000 in 2012.

Explanations for the high Māori youth suicide rate have been proposed.⁹ One was that the rate largely or wholly reflects the disadvantaged status of Māori in the context of New Zealand society. Another was that the rates reflect factors unique to Māori and to the experience of colonisation. Beautrais and Fergusson⁹ referred to cultural alienation, intergenerational modelling and confusion over identity. It was also suggested that Māori, who traditionally identify themselves as members of a collective group, may find difficulty in societies which value individualism. Evidence pointing conclusively to causative explanations that could lead to preventative strategies is lacking.

The suicide rates of young adult indigenous populations in both countries have remained high, but the recent fall in the suicide rate of non-indigenous youths in Australia has been much greater than the reduction in the non-Māori youth suicide rate in New Zealand. However, the suicide rate of men entering middle age in *both* Australia and New Zealand has remained at about 25 per 100,000. Table 1 shows that the New Zealand suicide rate of the 45–49 years

age-group fluctuated in a narrow range, from 22.3 to 26.9 per 100,000 during the last 60 years, and the 40–44 years group (male and female) maintained a fairly steady rate for most of those years. The fact that the suicide rate among Australian males aged 15–29 has fallen so much (Figures 4, 5), and that the peak rate in 2013 was at 45–49 is likely to be due to a cohort effect;¹⁰ the group now in their forties had a high suicide rate when aged 20–29. Drugs and socio-economic issues have been blamed. The current 20–29 years cohort's suicide rate is markedly lower.

Comparisons between New Zealand and Australian age patterns of suicide show remarkable similarities over time, and differences from suicide patterns in other countries. The patterns of male suicide in both countries have changed from one where suicide appears to increase as a function of age (the type still observed in some Asian countries¹¹), to a bimodal pattern. The Māori age pattern of suicide is unimodal, with the peak in youth and a late life rate close to zero since at least the 1980s. The indigenous Australian age pattern of suicide is virtually unimodal, but with a small rise in the late life rate. Such observations are potentially instructive.

Late-life suicide in New Zealand and Australia

The substantial decrease in suicide rates of males and females in New Zealand aged over 55 years has been progressive since the 1980s, and is similar to what has been observed in Australia.¹³ The fall cannot be related to the near-zero late life suicide rate of Māori, since this rate was already low in the 1980s.⁸

Possible explanations for the fall in late life suicide rates in both countries include:

1. Undoubtedly the use of therapeutic doses of antidepressants has increased since the 1950s. Compliance with doctors' prescription instructions has improved, particularly since selective serotonin reuptake inhibitors and other antidepressants with fewer side-effects have become available. There is evidence¹² that older people who kill themselves are more likely than younger people to have major depression at the time of death, and that such cases respond better than

non-major depression to biological treatments. Beautrais and colleagues¹⁴ noted evidence that serious suicidal behaviour in old age is largely attributable to major depression.

2. Snowdon and Baume,¹⁵ reviewing coroners' files, found that commonly, in cases of late life suicide, circumstances (physical illnesses or distressing situations) appeared to have precipitated suicidal feelings. Increased attention to health and welfare needs and to feelings of emotional deprivation among older and/or disabled people may have reduced suicide risk. Expansion of health services organised specifically for elderly people with physical problems (such as pain, breathlessness and fatigue) and for people requiring palliative care may well have reduced the hopelessness that can precipitate suicide. Reports suggest that health workers and interventionists are better trained and able, these days, to provide appropriate help, whether biological, psychological or environmental, thus helping to maintain self-esteem. The low suicide rate among older Māori has been attributed to their feeling more valued and being given more meaningful roles and status than non-indigenous older New Zealand people.⁹

Limitations

For various reasons, a country's suicide statistics may be recorded inaccurately. Changes in the way data are gathered may lead to false conclusions about changes in suicide rate. In Australia, underreporting of suicides probably grew between 2002

and 2006, with at least 11% of cases in 2004 uncounted.¹⁶ New Zealand figures point to a lower proportion of "undetermined intent deaths", and it seems unlikely that changes in the ratio have contributed significantly to the apparent fall in the elderly suicide rate or to the rise in the recorded youth suicide rate.

Conclusion

The Figures and Table show the remarkable change in the age patterns of suicide rates in New Zealand and Australia over the last six decades. Caution in interpreting the data is needed because of concerns about how suicide data are obtained and recorded. Those concerns apply across the age range and therefore, even if the size of the rates may be questioned, the observation that the rates in men and women, and in young and elderly, have changed in different directions, and substantially, gives good reason to examine differences between groups.

A complexity of factors is likely to have contributed to dramatic decreases in the suicide rates of older men, significant changes in elderly female suicide rates and the rise and fall of youth suicide rates. Changes within society and cultural nuances have doubtless been of major importance, and in different ways for young and old. There is evidence to suggest that improvements in health and community services have had effects on suicide rates, particularly in relation to both biological and psychological depression. It is hoped that publishing these data will provoke discussion about what leads to reduction in suicidal thinking, and how such factors vary between cultures, groups and personalities.

Competing interests:

Nil.

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