Suicide Trends and Social Factors New Zealand

1981–1999

Analyses from the New Zealand  
Census–Mortality Study

Report 5: Social Explanations for Suicide in New Zealand

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# Preface: Suite of Six Reports

## Social and epidemiological explanations for New Zealand’s suicide trends to 1999

This paper is one of a suite of six reports that the Ministry of Health commissioned from the Wellington School of Medicine and Health Services between 2001 and 2004. The suite of reports explores a range of possible social and epidemiological explanations, analyses and evidence about New Zealand’s suicide trends. Due to a three-year time lag in coroner statistics being available, most of the reports address suicide trends up to 1999.

### National suicide prevention strategy

The suite of reports aims to inform discussion on New Zealand’s proposed national suicide prevention strategy: *A Life Worth Living: New Zealand Suicide Prevention Strategy*.

|  |  |  |  |
| --- | --- | --- | --- |
| * **Report no.** | * **Topic** | * **Author/s** | * **Title** |
| * 1 | * Literature review (2002) | * Caroline Maskill Ian Hodges Velma McLellan Dr Sunny Collings | * *Explaining Patterns of Suicide: A selective review of studies examining social, economic, cultural and other population-level influences* |
| * 2 | * Review of routine data (2002) | * Stuart Ferguson Assoc Prof Tony Blakely Bridget Allan Dr Sunny Collings | * *Suicide Rates in New Zealand: exploring associations with social and economic factors* |
| * 3 | * Māori (2004) | * Dr Paul Hirini Dr Sunny Collings | * *Whakamomori: He whakaaro, he korero noa. A collection of contemporary views on Māori and suicide* |
| * 4 | * New Zealand–Finland comparison (2003) | * Assoc Prof Philippa Howden-Chapman Dr Simon Hales Dr Ralph Chapman Dr Ilmo Keskimāki | * *The Impact of Economic Recession on Youth Suicide: a comparison of New Zealand and Finland* |
| * 5 | * Data analysis from the New Zealand Census–Mortality Study (2004) | * Dr Sunny Collings Assoc Prof Tony Blakely June Atkinson Jackie Fawcett | * *Suicide Trends and Social Factors in New Zealand 1981–1999: Analyses from the New Zealand Census–Mortality Study* |
| * 6 | * Context and summary of reports 1–5 (2004) | * Dr Sunny Collings Assoc Prof Annette Beautrais | * *Suicide Prevention in New Zealand: a contemporary perspective* |

### Copies of reports and suicide publications

The Ministry of Health website, at [www.moh.govt.nz/](http://www.moh.govt.nz/), contains pdf copies of the following suicide related documents:

* the suite of six reports (2001–04)
* *A Life Worth Living: All Ages Suicide Prevention Strategy* (2005)
* Comprehensive review of the suicide prevention literature (Beautrais et al 2005)
* the latest annual statistics, published as *Suicide Facts*.

Copies of suite of reports and other suicide or injury prevention-related information is available at: New Zealand Injury Prevention Strategy [www.nzips.govt.nz](http://www.nzips.govt.nz), and Suicide Prevention Information New Zealand [www.spinz.org.nz](http://www.spinz.org.nz).

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# Disclaimer

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# Summary Statistics New Zealand Security Statement

The New Zealand Census−Mortality Study (NZCMS) is a study of the relationship between socioeconomic factors and mortality in New Zealand, based on the integration of anonymised population census data from Statistics New Zealand and mortality data from the New Zealand Health Information Service. The project was approved by Statistics New Zealand as a Data Laboratory project under the Microdata Access Protocols in 1997. The data sets created by the integration process are covered by the Statistics Act and can be used for statistical purposes only. Only approved researchers who have signed Statistics New Zealand’s declaration of secrecy can access the integrated data in the Data Laboratory. (A full security statement is in a technical report at [http://www.wnmeds.ac.nz/nzcms-info.html](http://www.wnmeds.ac.nz/nzcms-info.htm).) For further information about confidentiality matters in regard to this study, please contact Statistics New Zealand.

* Contents

Preface: Suite of Six Reports iii

Acknowledgements v

Disclaimer v

Summary Statistics New Zealand Security Statement v

Executive Summary ix

Introduction 1

Social factors, the social milieu and suicide 1

Potential implications for the prevention of suicide 2

The macrosocial context of the cohorts 3

Suicide trends in New Zealand, by sex, age and ethnicity 3

Analytical models of how social context may affect suicide rates 5

Socioeconomic position, marital status and suicide 7

Aim of this report 7

The New Zealand Census−Mortality Study 7

Method 8

Linkage of census and mortality records 8

Demographic and socioeconomic variables 9

Analyses 9

Results 11

Ethnicity 11

Marital status 14

Household income 17

Car access 21

Highest qualification 24

Labour-force status 27

Multivariable results 29

Examination of results by age group 31

Discussion and Conclusion 37

Identifying patterns: from statistical to trend inferences 37

Key findings 40

Conclusions 42

Appendices 43

References 55

List of Figures

Figure 1: Age-specific rates of suicide in New Zealand, 1949**−**98 4

Figure 2: Age-specific rates of suicide in New Zealand, 1980**−**99 4

Figure 3: Suicide trends by ethnicity, sex and age 12

Figure 4: Suicide trends, by marital status, sex and age 15

Figure 5: Suicide trends, by household income 18

Figure 6: Suicide trends among 25**−**44-year-old Māori males, by household income 19

Figure 7: Suicide trends, by household car access, sex and age 22

Figure 8: Suicide trends, by highest educational qualification, sex and age 25

Figure 9: Suicide trends, by labour-force status, sex and age 28

List of Tables

Table 1: Suicide rates (95 percent confidence intervals) per 100,000, by ethnicity 13

Table 2: Suicide rates (95 percent confidence intervals) per 100,000, by marital status 16

Table 3: Relative indices of inequality (95 percent confidence intervals) comparing suicide risk of low to high income 19

Table 4: Suicide rates (95 percent confidence intervals) per 100,000, by household income 20

Table 5: Suicide rates (95 percent confidence intervals) per 100,000, by household car access 23

Table 6: Suicide rates (95 percent confidence intervals) per 100,000, by highest qualification 26

Table 7: Suicide rates (95 percent confidence intervals) per 100,000, by labour-force status 29

Table 8: Rate ratios (95 percent confidence intervals) from Poisson regression models: 25**−**44-year-old males 32

Table 9: Rate ratios (95 percent confidence intervals) from Poisson regression models: 45**−**64-year-old males 35

Table 10: Standardised rate ratios of suicide, by ethnicity 43

Table 11: Standardised rate differences of suicide, by ethnicity 44

Table 12: Standardised rate ratios of suicide, by marital status 45

Table 13: Standardised rate differences of suicide, by marital status 46

Table 14: Standardised rate ratios of suicide, by household income 47

Table 15: Standardised rate differences of suicide, by household income 48

Table 16: Standardised rate ratios of suicide, by household car access 49

Table 17: Standardised rate differences of suicide, by household car access 50

Table 18: Standardised rate ratios of suicide, by highest qualification 51

Table 19: Standardised rate differences of suicide, by highest qualification 52

Table 20: Standardised rate ratios of suicide, by labour-force status 53

Table 21: Standardised rate differences of suicide, by labour-force status 54

# Executive Summary

This study investigated whether trends in suicide in New Zealand during the 1980s and 1990s were related to various social indicators. This involved using data from the New Zealand Census−Mortality Study (NZCMS) to determine whether the suicide rates that changed markedly and differently between age, gender and ethnic groups were also patterned by marital and socioeconomic markers in the context of a rapidly changing macrosocial environment. Data provided by the Census made it possible for us to investigate this for ethnicity, marital status, household income, car access, highest qualification and labour-force status.

This study is an extension of a previously published investigation from the NZCMS, which demonstrated an association between socioeconomic position and unemployment and suicide among 25–64-year-olds using a single NZCMS cohort. Here we present results from a series of national cohort studies covering four intervals in the 1980s and 1990s: 1981−84, 1986−89, 1991−94 and 1996−99.

The key findings of the current study were as follows.

* No socioeconomic or marital groups were immune to background trends in suicide rates.
* Over time, suicide trends varied by income.
* Being married is protective for men and women, which is consistent with other similar countries.
* Lower socioeconomic position was generally associated with higher suicide rates − a similar finding to some overseas studies.
* Among men aged 18−44 years and women aged 18−24 years, suicide rates increased as much among the employed as among the unemployed.
* Socioeconomic disadvantage appears to make a contribution to the risk of suicide among younger Māori men.
* Suicide rates were higher among more educated women than among less educated women over all time periods.
* We did not investigate important established proximal risk factors such as mental illness.

We have demonstrated that suicide rates are patterned by socioeconomic factors. Although we have not demonstrated the mechanisms for these associations, our findings are consistent with the existence of causal pathways between social conditions and death by suicide. It is notable that no social groups were immune to background suicide trends – although we did find evidence of greater susceptibility among low-income people. The challenge is to better understand the patterns we have observed, the nature of the links, and how these might inform interventions to reduce suicide rates.

# Introduction

## Social factors, the social milieu and suicide

The nature of the relationship between social factors and suicide has long been the subject of debate. This relationship is of interest because it is expected that a quantifiable understanding of what causes suicide will lead to the development of preventive interventions. Although there is no doubt that suicide rates in New Zealand, as elsewhere, are patterned by social factors (Stack 2000; Kposowa 2000; Blakely et al 2003; Ajwani et al 2003), there continues to be disagreement about the meaning of the patterning and how it might be used to develop practical methods for preventing suicide.

For example, many past observations about the relationship of suicide rates to social factors such as unemployment have been made on the basis of ecological studies (Norstrom 1988; Whitley et al 1999; Neelman and Lewis 1990; Hawton et al 2001). Such studies are commonly regarded as having limited value for establishing causation at the level of the individual. Other methods such as cohort and case control studies have been regarded as providing a higher quality of evidence for the risk factors for suicide, because they can provide more accurate evidence about causation at the level of the individual. However, it has also been argued that ecological studies are a powerful method for increasing our understanding of the effects of the social environment on health outcomes because they focus on context (Morgenstern 1995; Marmot 1998) – particularly when combined with individual-level data in a multi-level study design (Krieger 1994; Susser 1996; Diez-Roux 1998; Marmot 2000; Blakely and Woodward 2000).

New Zealand researchers have made a strong contribution to individual-level studies. For example, Beautrais and co-workers, of the Canterbury Suicide Project, have demonstrated that mental illness (and especially the presence of more than one disorder) makes a large contribution to the risk of medically serious suicide attempts (Beautrais, Joyce, Mulder, Fergusson et al 1996). In this study the odds of serious suicide attempts among those with two or more diagnosed mental disorders was 90 times greater than among those with no mental disorder. The population-attributable risk of mental illness was 76 percent. That is, the incidence of serious suicide attempts would be reduced by 76 percent if everyone who had mental illness could attain the much lower suicide risk of those people without mental illness.

Other work from the Canterbury Suicide Project and the Christchurch Longitudinal Health and Development Study has shown that childhood exposure to adversity and socioeconomic disadvantage and having a mental disorder make important independent contributions to the risk of serious suicide attempts among teenagers and young adults (Beautrais, Joyce and Mulder 1996). Favourable combinations of factors such as self-esteem, positive peer relationships and success at school confer relative resilience (Fergusson et al 2003). For older adults, mental illness (especially mood disorders) and lack of social support have been identified as important risk factors for attempted or completed suicide (Beautrais 2002).

It is clear from these and other studies that social factors that act as immediate social exposures are contributors to the risk of suicide. However, social factors might also act as higher-level contextual risk factors to influence an individual’s risk of suicide, either by direct effects or indirect effects via personal risk factors. For example, at the individual level unemployment is a modest predictor of suicide in New Zealand (Blakely et al 2003). However, it is possible that the unemployment rate, a characteristic of society itself, may also influence the risk of individuals. Other potential contextual risk factors include the overall economic performance of a country, and the level of income inequality in a society.

## Potential implications for the prevention of suicide

Whatever the problem in question, the success of any prevention strategies is dependent on the knowledge available about its causation and on the ability to modify risk or protective factors in the causal chain. Suicide prevention is increasingly being considered from a multi-level perspective (van Heeringen et al 2000), but there are challenges in terms of establishing a satisfactory standard of evidence to justify population-based interventions directed at any but the already established individual-level risk factors.

Wider social and cultural environments are difficult to characterise, and the causal nature of relationships with specific outcomes are more difficult to quantify in ways that meet the standard requirements of methodologically sound studies and causal inference. There is a tension between the ability to conduct in-depth enquiries of relatively few people, which yield much detail about individual-level exposures, and the ability to conduct less in-depth enquiries of large populations. Studies of large populations (such as national populations) provide an opportunity to examine the effect of aspects of the wider milieu on whole populations and sub-populations. Often in very large studies the ability to directly control for some individual level factors is lost, but alternative techniques such as sensitivity analyses of the ‘missing’ factors can offset some of the disadvantage (Blakely et al 2003).

It is important to note that a lack of evidence in respect of a purported risk factor *does not* mean it is not a risk factor; it means we do not yet know if it is one. It has been relatively easier to obtain strong evidence about individual-level risk factors for suicide than about contextual effects. However, this does not mean that risk factors exerting their effects at other levels are neither important nor modifiable. What is required is continued effort to try to better understand the relationships between contextual and individual-level factors and suicide.

Obviously some social, demographic or biological characteristics of individuals (such as marital status, sex or skin colour and facial appearance) have no potential for modification by population-based interventions. However, structural and cultural influences in society that result in part from the ways groups of people organise themselves and interact on the basis of such factors may be modifiable. For example, we cannot change people’s ethnicity, but we can modify social processes and structures that contribute to health, social and economic variations between ethnic groups (Krieger 2000; Jones 2000). This claim is supported by the observation that different countries elect to have different economic and welfare policies, which have differing effects on their social milieux. Variations in the social milieu also occur over time within countries. For example, the social acceptability of drinking and driving, and tobacco smoking, has diminished over time within New Zealand and it is plausible that government policies have made a contribution to these changes.

## The macrosocial context of the cohorts

This report uses data on the whole New Zealand population for the 1980s and 1990s. Given that New Zealand society changed dramatically during that time, we have a ‘natural experiment’ of changing social context within which to study any change in the association of individual-level social factors with suicide.

During the 1980s and 1990s major social and economic change occurred in New Zealand. The regulated economy of the late 1970s and early 1980s featured controls on price and wage fluctuations, state housing and mortgage subsidies for low-income people, and a steadily low unemployment rate (4 percent and below). Although there had been some pressure for change in the previous decade (Belich 2001), between 1984 and at least 1993 successive governments implemented major reforms to the relationship between the state and the public. Changes included the deregulation of the financial sector, reorganisation of the state sector, and the removal of supplementary income provisions and import tariffs for some industry sectors (Cheyne et al 1997; Boston et al 1999; Belich 2001). Some results of these reforms included a substantially flattened tax system, fully targeted income support, a consumption tax, market rentals for state-provided housing, privatised major utilities, user charges for secondary health, education and other government services, and a restructured labour market designed to facilitate ‘flexibility’ in employment (Mowbray 2001).

Since the onset of these changes, substantially widened income inequalities have been observed in New Zealand (Mowbray 2001; Statistics New Zealand 1999). The effects of this increased gap were not evenly distributed across the population, with Māori being affected more than non-Māori. For some of the key social determinants of health such as employment status, education, income and housing (Howden-Chapman and Tobias 2000), inequalities between Māori and non-Māori widened (Mowbray 2001; Statistics New Zealand 1999; Te Puni Kōkiri 2000).

## Suicide trends in New Zealand, by sex, age and ethnicity

Suicide rates in New Zealand have changed dramatically in the last 50 years (Beautrais 2003; Ferguson et al 2003), with dramatic increases among 15−24 and 25−44-year-olds and downward trends among people aged 45 years and older (see Figure 1). Looking at 15−24-year-olds, rates doubled in the 30 years between 1950 and 1980, and then doubled again between 1980 and the mid-1990s. Rates among 25−44-year-olds approximately doubled over the last 50 years of the 20th century. By sex, male suicide rates were approximately four times the female suicide rates by the end of the 1990s, a differential that had increased from a two-and-a-half-fold discrepancy around 1950.

A number of other countries also had increases in suicide rates and shifts in the population distribution of suicide during this period, including Australia, Finland and the USA (WHO 1999).

Figure 1: Age-specific rates of suicide in New Zealand, 1949−98



Source: Ferguson et al, 2003

Note: Rates are smoothed over three years.

Trends also varied by ethnicity during the 1980s and 1990s. In the early 1980s Māori had lower suicide rates than non-Māori non-Pacific people, but by the late 1990s Māori suicide rates were 50 percent greater (Figure 2) (Ajwani et al 2003). Pacific people tend to have lower suicide rates than both Māori and non-Māori non-Pacific. The pattern varied somewhat by age, with Māori suicide rates being double non-Māori non-Pacific rates among 15−24-year-olds during the late 1990s, and similar among 45−74-year-olds.

Figure 2: Age-specific rates of suicide in New Zealand, 1980−99

|  |  |
| --- | --- |
| * **Males** | * **Females** |
|  |  |
|  | |

Source: Ajwani et al 2003

Notes: Rates are smoothed over three years and adjusted for numerator−denominator bias. Prioritised ethnic groups have been used.

These changes in suicide rates and trends during the 1980s and 1990s indicate the possibility of changes in the vulnerability to suicide for different groups in society. Two possible − although not mutually exclusive − explanations for the *increasing* suicide trends among young people, Māori and males might include:

* an increase in the prevalence of individual-level suicide risk factors among some sub-populations (these risk factors might range from mental illness to substance use to socioeconomic position, and if such risk factors interacted, or were just increasingly *clustered* among these sub-populations, they might explain the observed trends)
* a differential impact, across sex, age and ethnic groups, of changes in the social context (eg, secular trends in community-level characteristics such as religiosity, individualism, and labour market factors) that altered the social and individual acceptability of suicide.

We expand on this second possibility in the next section.

## Analytical models of how social context may affect suicide rates

From a study design or analytical point of view, there are three ways in which social context might influence health status or outcomes – in this case suicide.

* Contextual variables may *change the distribution of individual-level risk factors* for suicide. For example, periods of high unemployment may affect youth more than other groups in society, increasing the rates of unemployment and poverty in this group, which might in turn adversely affect their mental health and thus increase suicide rates for this sub-population.
* Contextual variables may *directly influence the suicide risk of individuals*. For example, decreasing social cohesion may directly increase the suicide rates in a given sub-population. By ‘directly’ we mean that there will be pathways between high-level and individual-level variables that allow the context to have an effect at the level of the individual, but we may either not know, or not need to know, what these pathways are.
* Contextual factors may *alter the association between individual-level risk or protective factors* and suicide. For example, high degrees of income inequality and social fragmentation may increase the risk of suicide among the unemployed.

These three mechanisms have been described as indirect cross-level effects, direct cross-level effects, and cross-level effect modification (Blakely and Woodward 2000) respectively.

Quantitatively examining the possible association of contextual factors with health requires varying the contextual variable of interest. Which is to say, the essential condition for epidemiological studies is variation in the exposure. There are two main types of either ecological or multi-level study designs that ensure variation in the contextual variable: comparisons over time and comparisons across space (eg, neighbourhoods, regions and countries).

For example, to examine the effect of income inequality as the contextual variable, we might conduct analyses of changes in suicide rates over time within one country to see if they correlate with changes in income inequality over time. Rapidly rising levels of income inequality and unemployment in New Zealand between the late 1980s and early 1990s did in fact coincide with increasing youth suicide rates over time (Ferguson et al 2003). Note that this rapidly rising income inequality and unemployment also coincided with falling suicide rates among people aged 45 years and older. Therefore if this were to be accepted as a partial explanation for rising suicide rates in the younger age group, a differential effect for younger and older age groups must be invoked.

If such a differential effect exists it could be for several reasons. The association of income inequality and unemployment with suicide rates could vary by age. Alternatively, an intervening unmeasured factor, such as improved access to treatment for depression, may protect people in the older age group. Finally, the association could be spurious: an artefact of small overall numbers causing large fluctuations in rates, for example.

Turning to comparisons over space within one time period, the association of regional income inequality with suicide in New Zealand from 1991 to 1994 has been examined (Blakely and Atkinson). This study compared suicide risk across 35 regions using New Zealand Census–Mortality Study (NZCMS) data and a multi-level design that adjusted for individual-level confounding by sex, age, ethnicity and household income. The Gini coefficient was used to measure regional income inequality. The Gini ranges from zero (perfect equality) to 1.0 (perfect inequality), and the inter-quartile range was 0.02. Among 25−64-year-old females, the relative risk for a 0.01 unit increase in the Gini was 1.087, but the 95 percent confidence interval comfortably included 1 (0.957−1.234 (ie, the association was not statistically significant). The association among males was weaker still, and also not statistically significant.

There are good reasons why we might not expect an association of income inequality with suicide *within* New Zealand. First, New Zealand has relatively little regional variation in education, health, welfare and other systems that might plausibly explain any material basis to the association of income inequality with health. Second, and related to the first reason, there is probably less variation in income inequality by region than in other countries due to the same taxation and government systems applying throughout New Zealand. While it is difficult to make comparisons of income inequality between countries, it seems likely that the range of income inequality (the exposure) within New Zealand is narrower than for US counties and metropolitan areas, say, and that the level of regional income inequality is less.

It is important to note that most of the studies that compare rates over time and across space test only for the presence of direct cross-level effects. This is the case even when a multi-level study includes individual-level data. Statistical testing for cross-level effect modification requires very powerful studies, and testing for indirect cross-level effects requires much individual-level data, preferably with repeated measures.

## Socioeconomic position, marital status and suicide

Numerous studies internationally demonstrate an association of lower socioeconomic position and not being married with higher suicide rates. Suicide is just one of many (actually most) diseases patterned in this way by social factors (Marmot and Wilkinson 1999; Berkman and Kawachi 2000; Blakely et al 2002). What do we already know about the association of marital status and socioeconomic position with suicide at any one point in time in New Zealand? Consistent with international research, we have previously found higher suicide risk among lower socioeconomic and unmarried adults using the 1991−94 cohort of the NZCMS. Of interest, 6 percent of suicides were attributable to unemployment, and the association of unemployment with suicide persisted after adjustment for socioeconomic factors (Blakely et al 2003). The investigation reported here is a logical extension to the earlier paper, which reported only on individual-level associations at one point in time, finding that among 25–64–year-old men, 6 percent of suicides were attributable to unemployment (Blakely et al 2003). Now that all four NZCMS cohorts (see below) are assembled, this report extends the work of this previous research paper that was only able to include 1991−94 data, and presents trends over time during the 1980s and 1990s.

## Aim of this report

As stated previously, there were both changing social contexts in New Zealand during the 1980s and 1990s and changing patterns of suicide by demographic groups. However, in this report we do not attempt to identify which aspects of the changing social context might be important for suicide. Rather, we take the varying secular trends in suicide by sex, age and ethnicity as the backdrop, and then try to determine whether these trends also varied by marital status and socioeconomic factors during the 1980s and 1990s. Put another way, we examine whether people in different socioeconomic or marital groups were more (or less) vulnerable to background secular trends in suicide. Given the macro-social changes in New Zealand during this period, this analysis will allow a consideration of what we defined above as cross-level effect modification. That is, we can examine how the individual-level associations of marital status and socioeconomic position with suicide *changed* over time, and then make inferences about how they changed with the changing social context.

## The New Zealand Census−Mortality Study

The NZCMS is a series of four short-duration cohort studies of the entire New Zealand population (1981, 1986, 1991 and 1996 censuses), each followed up for mortality in the subsequent three years. (As such, the NZCMS generates Platt type 1 analysis findings [Platt 1984].) The four cohorts are, in essence, replicated studies that ensure high validity when making comparisons over time. With this design we can examine the association between social variables and suicide at each of four periods evenly spread over the 1980s and 1990s, and also determine trends in suicide by social factors over that 20-year period.

# Method

## Linkage of census and mortality records

The anonymous and probabilistic record linkage of census and mortality data in the NZCMS has been described in detail elsewhere (Blakely et al 2000; Blakely 2002b; Hill et al 2002; Fawcett et al 2002). Further details can be found at the NZCMS website ([www.wnmeds.ac.nz/nzcms-info.html](http://www.wnmeds.ac.nz/nzcms-info.html)). In summary, mortality records for people aged 0−74 years of age on 1981, 1986, 1991 and 1996 census nights, and who died in the three years following census night, were anonymously and probabilistically linked to the respective census. On average, three-quarters of mortality records were linked to a census record (the proportion was about 80 percent in 1996−99 and closer to 70 percent in 1981−84). The linkage success varied by age (lower among 15−24-year-olds) and ethnicity (lower among Māori and Pacific peoples). However, once allowing for these variations by age and ethnicity, there was relatively little difference in linkage success by socioeconomic deprivation (Blakely et al 2000).

The problem of varying linkage rates by demographic strata was overcome by using weighting in all cohort analyses of the linked data (Fawcett et al 2002). While many mortality records were not linked to census records, we knew a considerable amount about these deaths from the mortality data (eg, sex, age, ethnicity, small area deprivation, region of New Zealand). Accordingly, we stratified all eligible mortality records (linked and unlinked) by these variables, and within each stratum determined the linkage proportion. We then used the inverse of this proportion to weight the linked census−mortality record in subsequent cohort analyses.

For example, if 20 out of 30 25−44-year-old Māori males in Northland from non-socioeconomically deprived neighbourhoods were linked to a census record, we assigned a weight of 1.5 (30 divided by 20) to each of these 20 linked census−mortality records. That is, within each of these fine strata we assumed that the linked census−mortality records were representative of those census respondents who actually died during follow-up, but whose mortality record was not linked to their census record. For any residual linkage bias to remain in the analyses there must be remaining linkage bias by unmeasured characteristics within these strata. We do not believe this is likely for demographic and socioeconomic characteristics. However, it is possible for other variables such as residential mobility, for which we had no *direct* measure. Therefore, we do not report cohort analyses for the potentially interesting variable of housing tenure, because this is highly correlated with residential mobility.

## Demographic and socioeconomic variables

The census variables used as independent variables were sex, age, ethnicity, marital status, labour-force status, highest qualification, household income, and household car access.

We used a ‘prioritised’ definition of ethnicity. Māoriethnicity was assigned if one of the three possible self-identified ethnicity responses on the 1986, 1991 or 1996 censuses was Māori. Therefore, for Māori, the prioritised ethnic group represents the total Māori ethnic group. For those not allocated as Māori, the prioritised ethnic group was assigned as Pacific if one of the self-identified ethnic groups was Pacific. The remainder were assigned as non-Māori non-Pacific. In the 1981 census those who recorded any degree of Māori ethnic origin were categorised as prioritised Māori. Of the rest, those who recorded any degree of Pacific ethnic origin in the 1981 census were categorised as prioritised Pacific. Although the definition is not identical to the 1986 and 1991 censuses, it is similar enough for a time series.

Marital status was based on a legal definition of marriage and categorised as currently married (married, remarried), never married and a combined category of separated, divorced, and widowed. Labour-force status was classified as employed, unemployed (ie, actively seeking work *and* available for work) and the non-active labour force (eg, retired, students, homemakers, permanently sick). Highest qualification included post-school qualifications for 25−64-year-olds, but was limited to school qualifications for 18−24-year-olds.

Household income was calculated by summing the personal incomes of all adults in the household, inflation adjusting to 1996 dollars, and equivalising for the number of children and adults in the household using the New Zealand-specific Jensen scale (Jensen 1988). Tertile groupings of household income were derived *separately* for each of the eight demographic groups formed by cross-classifying sex and the four age groups of 15−24, 25−44, 45−64 and 65−77-years. This preserved an approximately even spread of incomes within each demographic stratum, and was not inconsistent with the underlying concept of ranking by income.

## Analyses

Age- and ethnicity-standardised rates of suicide death (ICD-9 codes 950−959 and 980−989) were calculated for all census respondents who had complete data for each socioeconomic factor and marital status. Direct standardisation methods were used (Rothman and Greenland 1998), with the 1991 census population as the external standard. The numbers of weighted deaths were used as numerators, and person-time as denominators. We also calculated standardised rate ratios (SRRs), expressed per 100,000 person-years, and standardised rate differences (SRDs), and accompanying 95 percent confidence intervals. Ethnicity was also standardised for, because it is a determinant of socioeconomic position and is associated with suicide rates (Ajwani et al 2003), and is therefore a potential confounder. To examine trends over time, we used graphs and summary estimates to:

* compare suicide rates across time within each level of socioeconomic position, including testing for statistically significant trends
* compare the social gradient or disparity in suicide rates across time (eg, whether the association of income with suicide changed over the four cohorts).

We initially attempted to conduct analyses within the eight sex-by-age strata. However, some analyses were not possible (eg, attained educational qualification among 15−24-year-olds, because many are still undertaking education). For statistical precision we also had to aggregate age groups.

Finally, we conducted multivariable analyses to answer specific questions that arose from the above bivariate analyses. (These questions are listed at the beginning of the section on ‘Multivariable analyses’.) Due to varying rates and trends in suicide over time by sex, age group and ethnic group, we did not aggregate the data for these multivariable analyses. Rather, we were restricted to conducting analyses among 25−44 and 45−64-year-old males only, and comparing just Māori and non-Māori non-Pacific. Due to sparse data, it was not possible to conduct multivariable analyses for females, 65−74-year-olds, or Pacific males aged 25−64 years of age. We used Poisson regression for the multivariable analyses.

# Results

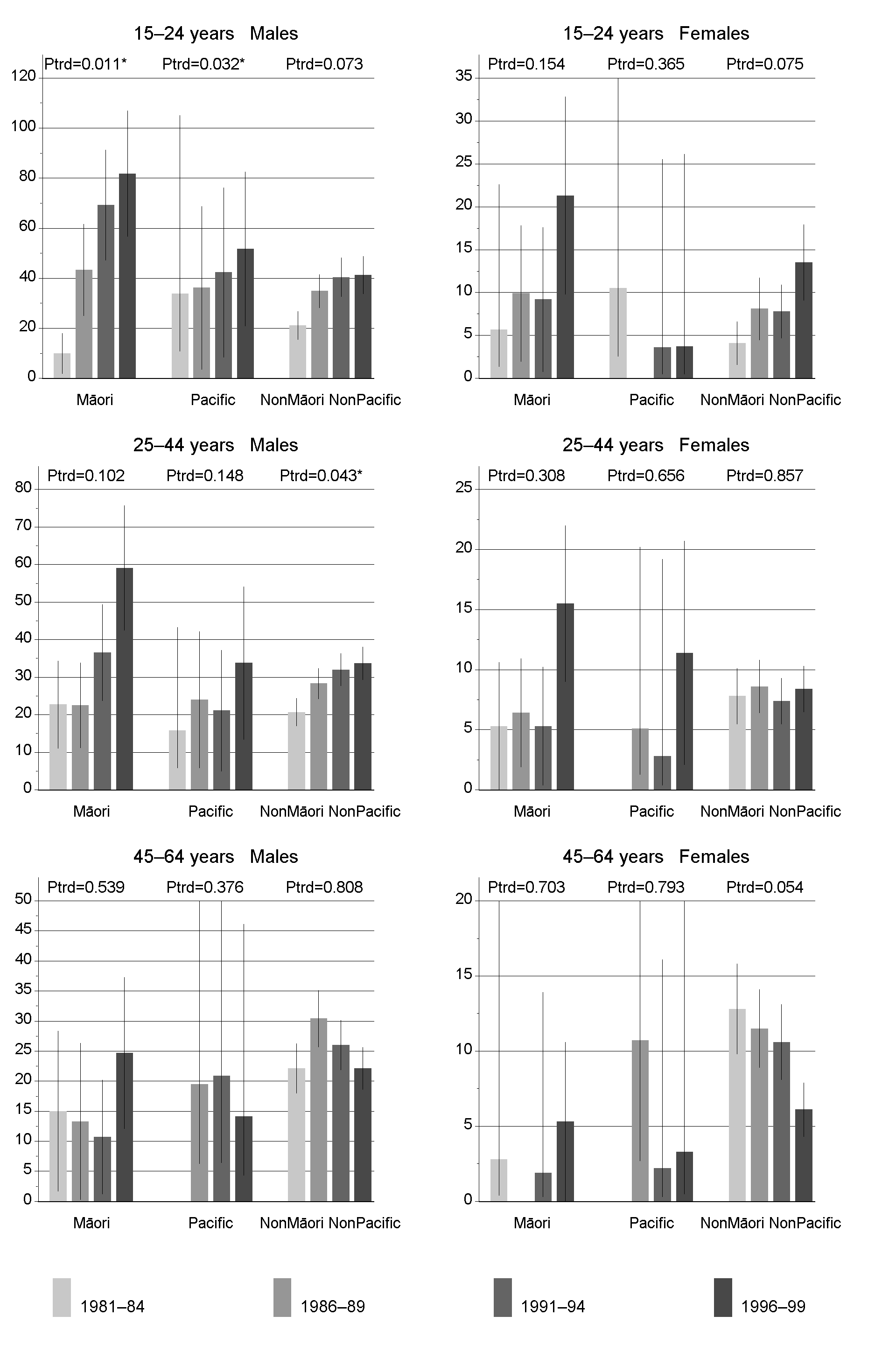
## Ethnicity

Figure 3 below shows the age-standardised rates of suicide for Māori, Pacific and non-Māori non-Pacific people per 100,000 person-years in each of the 1981−84, 1986−89, 1991−94 and 1996−99 periods. There were too few suicide deaths among Māori and Pacific people aged 65 years and older to allow presentation. The actual rates (and 95 percent confidence intervals) are presented in Table 1 below, and standardised rate ratios and differences are presented in Tables 10 and 11 of the Appendix.

Examining Figure 3, it is apparent that suicide rates increased over the period for most ethnic- by-sex-by-age groupings, with p values of the trend statistics often being less than 0.05. Exceptions to this general pattern were non-Māori non-Pacific females aged 25−44 years, and non-Māori non-Pacific males and females aged 45−64 years. Notably, 45−64-year-old non-Māori non-Pacific females actually had a decreasing trend (52 percent decrease from 1981−84 to 1996−99; p for trend = 0.05). The trends for Pacific people were very imprecise due to few deaths, although for 15−24 and 25−44-year-old males the trend tended to be an increasing one. The most pronounced increasing trends occurred among Māori, most notably 15−24-year-old males (an eight-fold increase; p for trend = 0.01), but also among 15−24-year-old females (a four-fold increase) and 25−44-year-old males and females (two- to three-fold increases).

Comparing across ethnic groups, among 15−24 and 25−44-year-old males and females non-Māori non-Pacific people had higher suicide rates than Māori during 1981−84 but by 1996−99 this pattern had reversed.

Figure 3: Suicide trends by ethnicity, sex and age



Notes: Rates are per 100,000 person-years of follow-up, and age-standardised by five-year group using the 1991 census as the standard population. Error bars are 95% confidence intervals.

Table 1: Suicide rates (95 percent confidence intervals) per 100,000, by ethnicity

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Ethnicity** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Māori | * 10.0 | * (2.0–18.0) | * 43.3 | * (25.1–61.5) | * 69.2 | * (47.2–91.2) | * 81.8 | * (56.7–106.9) | * 0.011 |
| * Pacific | * 33.9 | * (10.9–105.1) | * 36.2 | * (3.7–68.7) | * 42.3 | * (8.5–76.1) | * 51.7 | * (20.9–82.5) | * 0.032 |
| * Non-Māori non-Pacific | * 21.2 | * (15.6–26.8) | * 34.9 | * (28.3–41.5) | * 40.4 | * (32.7–48.1) | * 41.3 | * (33.8–48.8) | * 0.073 |
| * 25−44 | * Māori | * 22.7 | * (11.1–34.3) | * 22.5 | * (11.2–33.8) | * 36.6 | * (23.8–49.4) | * 59.1 | * (42.5–75.7) | * 0.102 |
| * Pacific | * 15.8 | * (5.8–43.2) | * 24.0 | * (5.9–42.1) | * 21.1 | * (5.0–37.2) | * 33.8 | * (13.5–54.1) | * 0.148 |
| * Non-Māori non-Pacific | * 20.7 | * (17.0–24.4) | * 28.3 | * (24.3–32.3) | * 32.0 | * (27.7–36.3) | * 33.7 | * (29.4–38.0) | * 0.043 |
| * 45−64 | * Māori | * 15.0 | * (1.7–28.3) | * 13.3 | * (0.3–26.3) | * 10.7 | * (1.2–20.2) | * 24.7 | * (12.1–37.3) | * 0.539 |
| * Pacific | * 0.0 | * (0.0–0.0) | * 19.5 | * (6.3–60.8) | * 20.9 | * (6.4–67.9) | * 14.1 | * (4.3–46.1) | * 0.376 |
| * Non-Māori non-Pacific | * 22.1 | * (18.0–26.2) | * 30.4 | * (25.7–35.1) | * 26.0 | * (21.9–30.1) | * 22.1 | * (18.6–25.6) | * 0.808 |
| * 25−64 | * Māori | * 19.7 | * (10.9–28.5) | * 19.0 | * (10.4–27.6) | * 26.7 | * (18.0–35.4) | * 45.9 | * (34.6–57.2) | * 0.141 |
| * Pacific | * 9.8 | * (0.0–19.6) | * 22.3 | * (8.3–36.3) | * 21.0 | * (7.3–34.7) | * 26.2 | * (12.1–40.3) | * 0.088 |
| * Non-Māori non-Pacific | * 21.2 | * (18.4–24.0) | * 29.1 | * (26.0–32.2) | * 29.7 | * (26.6–32.8) | * 29.3 | * (26.3–32.3) | * 0.194 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Māori | * 5.7 | * (1.4–22.6) | * 9.9 | * (2.0–17.8) | * 9.2 | * (0.8–17.6) | * 21.3 | * (9.8–32.8) | * 0.154 |
| * Pacific | * 10.5 | * (2.6–42.1) | * 0.0 | * (0.0–0.0) | * 3.6 | * (0.5–25.5) | * 3.7 | * (0.5–26.1) | * 0.365 |
| * Non-Māori non-Pacific | * 4.1 | * (1.6–6.6) | * 8.1 | * (4.5–11.7) | * 7.8 | * (4.7–10.9) | * 13.5 | * (9.1–17.9) | * 0.075 |
| * 25−44 | * Māori | * 5.3 | * (0.0–10.6) | * 6.4 | * (1.9–10.9) | * 5.3 | * (0.4–10.2) | * 15.5 | * (9.0–22.0) | * 0.308 |
| * Pacific | * 0.0 | * (0.0–0.0) | * 5.1 | * (1.3–20.2) | * 2.8 | * (0.4–19.2) | * 11.4 | * (2.1–20.7) | * 0.656 |
| * Non-Māori non-Pacific | * 7.8 | * (5.5–10.1) | * 8.6 | * (6.4–10.8) | * 7.4 | * (5.5–9.3) | * 8.4 | * (6.5–10.3) | * 0.857 |
| * 45−64 | * Māori | * 2.8 | * (0.4–20.6) | * 0.0 | * (0.0–0.0) | * 1.9 | * (0.3–13.9) | * 5.3 | * (0.0–10.6) | * 0.703 |
| * Pacific | * 0.0 | * (0.0–0.0) | * 10.7 | * (2.7–43.1) | * 2.2 | * (0.3–16.1) | * 3.3 | * (0.5–22.8) | * 0.793 |
| * Non-Māori non-Pacific | * 12.8 | * (9.8–15.8) | * 11.5 | * (8.9–14.1) | * 10.6 | * (8.1–13.1) | * 6.1 | * (4.3–7.9) | * 0.054 |
| * 25−64 | * Māori | * 4.4 | * (0.5–8.3) | * 4.0 | * (1.2–6.8) | * 4.0 | * (0.6–7.4) | * 11.7 | * (7.2–16.2) | * 0.327 |
| * Pacific | * 0.0 | * (0.0–0.0) | * 7.2 | * (0.1–14.3) | * 2.6 | * (0.6–11.0) | * 8.4 | * (2.1–14.7) | * 0.848 |
| * Non-Māori non-Pacific | * 9.7 | * (7.9–11.5) | * 9.7 | * (8.0–11.4) | * 8.6 | * (7.1–10.1) | * 7.5 | * (6.1–8.9) | * 0.046 |

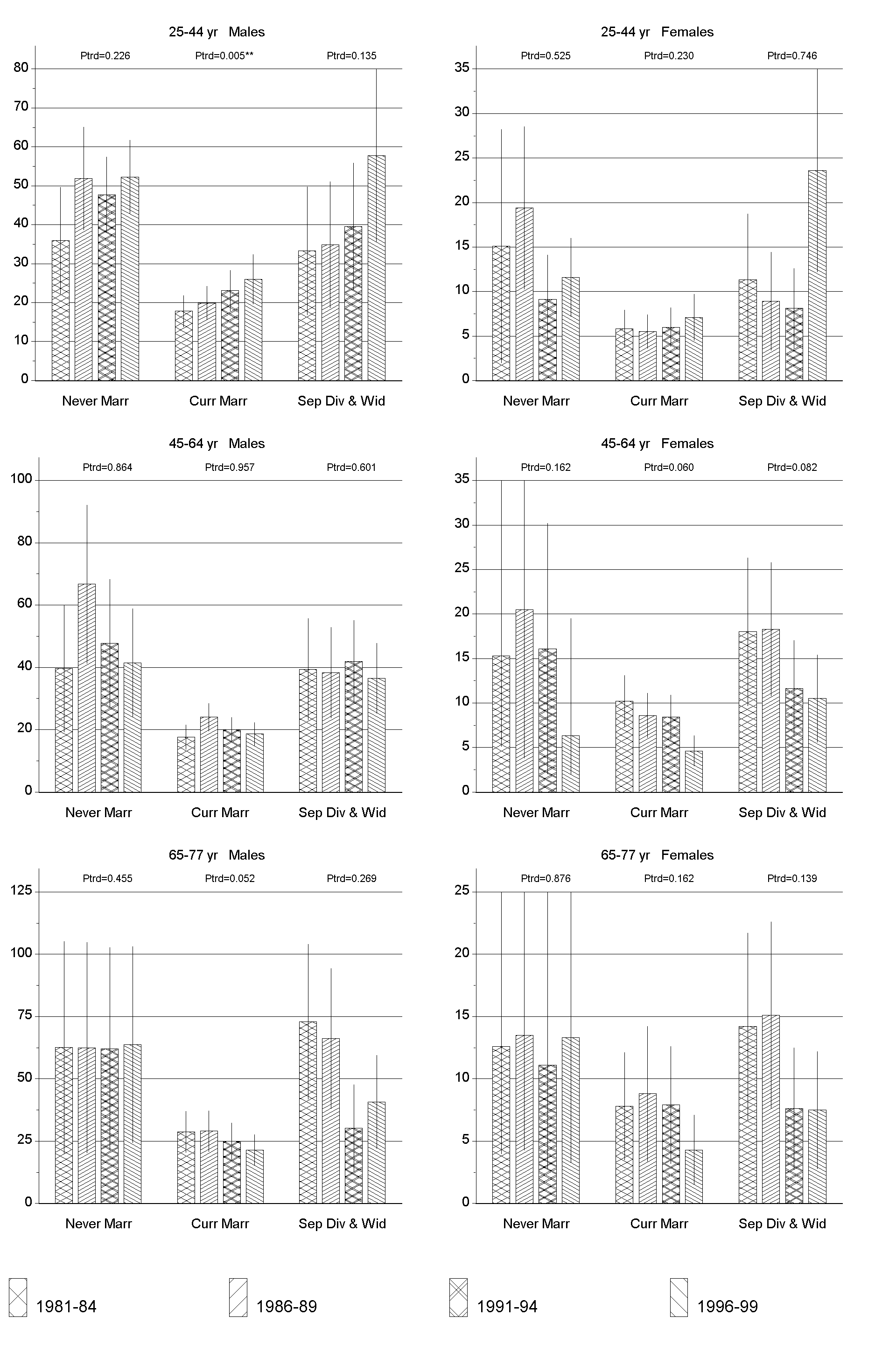
## Marital status

Figure 4 below shows the age-standardised rates of suicide per 100,000 person-years for currently married people, separated, divorced and widowed people, and people who have never married. Results are not presented for 15−24-year-olds. The actual rates (and 95 percent confidence intervals) are presented in Table 2, and standardised rate ratios and differences are presented in Tables 12 and 13 of the Appendix.

Among all demographic groups and all cohorts, married people had lower suicide rates than either never married or separated, divorced and widowed people. Based on an inspection of the rate ratios and 95 percent confidence intervals (Table 12), there was no convincing evidence of a changing strength of the association of marital status with suicide over time.

From the early 1980s to the late 1990s (Figure 4), suicide rates increased by about 50 percent among 25−44-year-old males in all three marital status groups. This increase was only statistically significant among married 25−44-year-old males (p for trend < 0.01), a consequence of the smaller size of the two other groups. Among 25−44-year-old females and 45−64-year-old males there were no clear trends, but among 45−64-year-old females the suicide rates approximately halved among all three marital status groups. The only significant trend among 65−77-year-olds was a 26 percent decrease among currently married males (p for trend = 0.05).

Figure 4: Suicide trends, by marital status, sex and age



Notes: Rates are per 100,000 person-years of follow-up, and age- and ethnicity-standardised (five-year age groups, and Māori, Pacific, non-Māori non-Pacific) using the 1991 census as the standard population. Error bars are 95% confidence intervals.

Table 2: Suicide rates (95 percent confidence intervals) per 100,000, by marital status

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Marital status** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * Never married | * 35.9 | * (22.2–49.6) | * 51.9 | * (38.7–65.1) | * 47.7 | * (38.0–57.4) | * 52.3 | * (42.9–61.7) | * 0.226 |
| * Currently married | * 17.8 | * (13.8–21.8) | * 19.9 | * (15.6–24.2) | * 23.1 | * (17.9–28.3) | * 26.0 | * (19.6–32.4) | * 0.005 |
| * Separated, divorced and widowed | * 33.3 | * (16.9–49.7) | * 34.9 | * (18.7–51.1) | * 39.5 | * (23.2–55.8) | * 57.8 | * (35.7–79.9) | * 0.135 |
| * 45−64 | * Never married | * 39.6 | * (19.3–59.9) | * 66.7 | * (41.3–92.1) | * 47.7 | * (27.2–68.2) | * 41.4 | * (24.0–58.8) | * 0.864 |
| * Currently married | * 17.6 | * (13.7–21.5) | * 24.0 | * (19.6–28.4) | * 20.0 | * (16.1–23.9) | * 18.6 | * (15.0–22.2) | * 0.957 |
| * Separated, divorced and widowed | * 39.4 | * (23.1–55.7) | * 38.3 | * (23.7–52.9) | * 41.9 | * (28.7–55.1) | * 36.5 | * (25.3–47.7) | * 0.601 |
| * 65−77 | * Never married | * 62.6 | * (20.1–105.1) | * 62.5 | * (20.2–104.8) | * 62.0 | * (21.4–102.6) | * 63.8 | * (24.5–103.1) | * 0.455 |
| * Currently married | * 28.7 | * (20.5–36.9) | * 29.0 | * (20.8–37.2) | * 25.0 | * (17.8–32.2) | * 21.4 | * (15.2–27.6) | * 0.052 |
| * Separated, divorced and widowed | * 72.9 | * (41.8–104.0) | * 66.1 | * (38.0–94.2) | * 30.2 | * (12.8–47.6) | * 40.7 | * (21.9–59.5) | * 0.269 |
| * 25−64 | * Never married | * 37.3 | * (25.8–48.8) | * 57.5 | * (44.8–70.2) | * 47.7 | * (37.9–57.5) | * 48.1 | * (39.3–56.9) | * 0.619 |
| * Currently married | * 17.7 | * (14.8–20.6) | * 21.5 | * (18.3–24.7) | * 21.9 | * (18.4–25.4) | * 23.2 | * (19.0–27.4) | * 0.080 |
| * Separated, divorced and widowed | * 35.7 | * (23.8–47.6) | * 36.2 | * (24.8–47.6) | * 40.4 | * (29.1–51.7) | * 49.7 | * (35.4–64.0) | * 0.097 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * Never married | * 15.1 | * (2.0–28.2) | * 19.4 | * (10.3–28.5) | * 9.1 | * (4.1–14.1) | * 11.6 | * (7.2–16.0) | * 0.525 |
| * Currently married | * 5.8 | * (3.7–7.9) | * 5.5 | * (3.6–7.4) | * 6.0 | * (3.8–8.2) | * 7.1 | * (4.5–9.7) | * 0.230 |
| * Separated, divorced and widowed | * 11.3 | * (3.9–18.7) | * 8.9 | * (3.4–14.4) | * 8.1 | * (3.6–12.6) | * 23.6 | * (12.2–35.0) | * 0.746 |
| * 45−64 | * Never married | * 15.3 | * (5.1–46.3) | * 20.5 | * (3.8–37.2) | * 16.1 | * (2.0–30.2) | * 6.3 | * (2.0–19.5) | * 0.162 |
| * Currently married | * 10.2 | * (7.3–13.1) | * 8.6 | * (6.1–11.1) | * 8.4 | * (5.9–10.9) | * 4.6 | * (2.9–6.3) | * 0.060 |
| * Separated, divorced and widowed | * 18.0 | * (9.7–26.3) | * 18.3 | * (10.8–25.8) | * 11.6 | * (6.2–17.0) | * 10.5 | * (5.6–15.4) | * 0.082 |
| * 65−77 | * Never married | * 12.6 | * (4.0–39.8) | * 13.5 | * (4.3–42.0) | * 11.1 | * (2.8–44.7) | * 13.3 | * (3.3–53.3) | * 0.876 |
| * Currently married | * 7.8 | * (3.5–12.1) | * 8.8 | * (3.4–14.2) | * 7.9 | * (3.2–12.6) | * 4.3 | * (1.5–7.1) | * 0.162 |
| * Separated, divorced and widowed | * 14.2 | * (6.7–21.7) | * 15.1 | * (7.6–22.6) | * 7.6 | * (2.7–12.5) | * 7.5 | * (2.8–12.2) | * 0.139 |
| * 25−64 | * Never married | * 15.2 | * (4.8–25.6) | * 19.8 | * (11.4–28.2) | * 11.8 | * (5.7–17.9) | * 9.6 | * (5.8–13.4) | * 0.150 |
| * Currently married | * 7.4 | * (5.7–9.1) | * 6.7 | * (5.2–8.2) | * 6.9 | * (5.2–8.6) | * 6.2 | * (4.5–7.9) | * 0.133 |
| * Separated, divorced and widowed | * 13.8 | * (8.2–19.4) | * 12.4 | * (7.9–16.9) | * 9.4 | * (6.0–12.8) | * 18.7 | * (11.4–26.0) | * 0.957 |

## Household income

Figure 5 shows the age-standardised rates of suicide per 100,000 person-years for low, medium and high household income tertiles. Results are presented for all age groups. The actual rates (and 95 percent confidence intervals) are presented in Table 4, and standardised rate ratios and differences are presented in Tables 14 and 15 of the Appendix.

Looking at trends over time, we can see from Figure 5 that there was a tendency for suicide rates to increase or decrease together regardless of household income among 15−24 and 65−77-year-olds, respectively. Among the middle two age groups, though, there appears to have been differing trends in suicide rates by level of household income.

Among 25−44-year-old males, the suicide rate from 1981−84 to 1996−99 increased by 105 percent, 69 percent and 51 percent for low-, medium- and high-income males, respectively (p for trend all 0.05 or less). Suicide rates also increased markedly among low-income 25−44-year-old females (175 percent; p for trend = 0.09), but showed no apparent change among middle- and high-income groups.

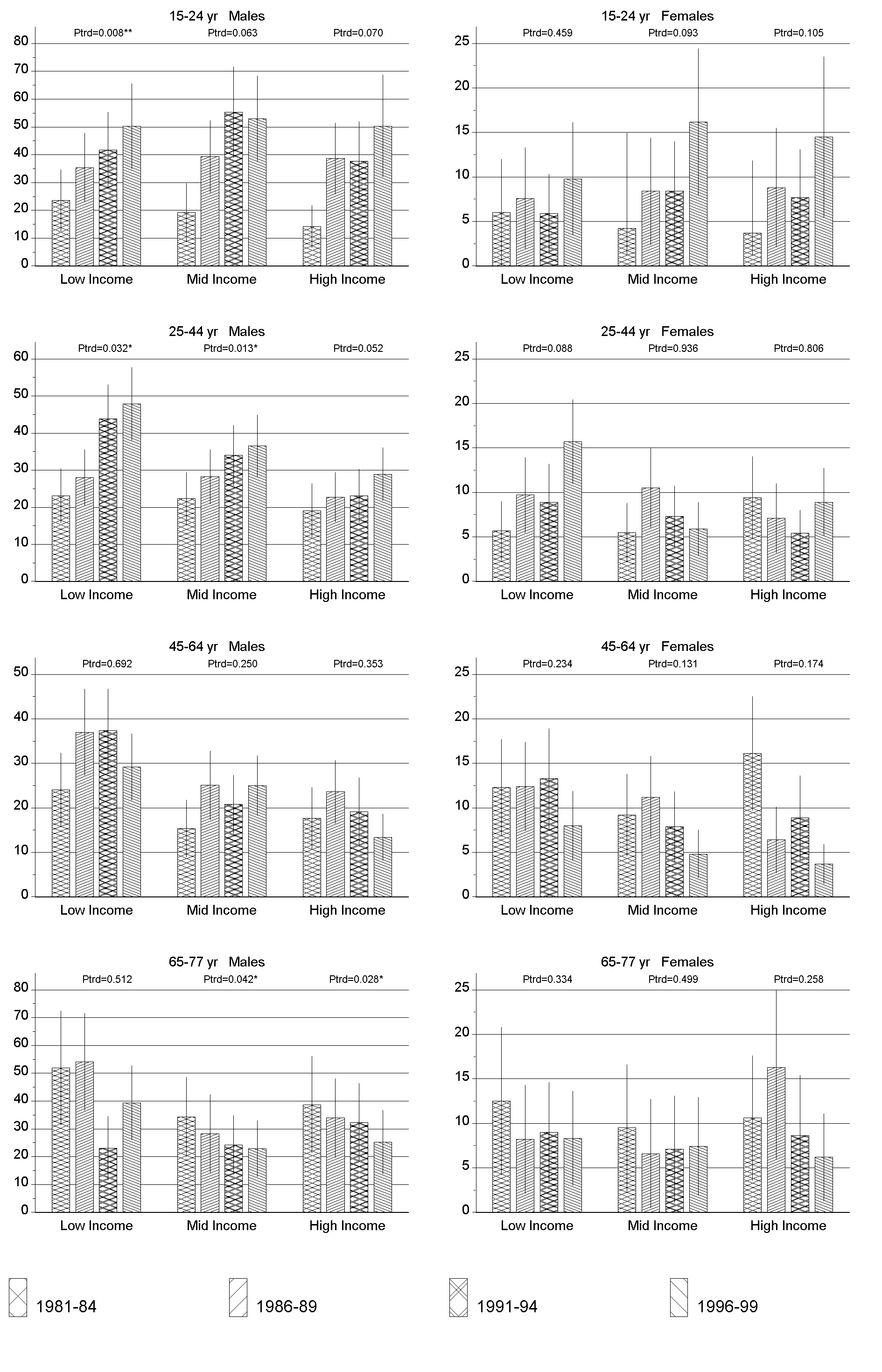
Among 45−64-year-olds the patterns and trends were less clear, but there was a suggestion that any decrease in suicide rates was only apparent in the high-income tertiles.

Comparing across income groups, low-income people aged 25−64 years of age (and possibly 65−77 years) tended to have higher suicide rates than high-income people. It is possible that the lack of any clear difference in suicide rates across income tertiles among 15−24-year-olds was due to the difficulty using household income to characterise socioeconomic position among youth (ie, due to substantial misclassification bias through moving households and not yet being in the active labour force).

Importantly, the standardised rate ratios (SRRs) comparing suicide rates in the low-income tertile to the high-income tertile increased over time for males and females aged 25−64 years (see Table 14) as follows:

* among 25−44-year-old males the SRR increased from 1.22 (95 percent confidence interval 0.75−2.00) to 1.66 (1.20−2.29)
* among 25−44-year-old females the SRR increased from 0.60 (0.28−1.30) to 1.77 (1.05−2.98)
* among 45−64-year-old males the SRR increased from 1.31 (0.78−2.21) to 2.18 (1.37−3.47)
* among 45−64-year-old females the SRR increased from 0.76 (0.42−1.37) to 2.15 (1.00−4.62).

Figure 5: Suicide trends, by household income



Notes: Rates are per 100,000 person-years of follow-up, and age- and ethnicity-standardised (five-year age groups, and Māori, Pacific, non-Māori non-Pacific) using the 1991 census as the standard population. Error bars are 95% confidence intervals.

We explored these trends of suicide inequalities by income more extensively using the relative index of inequality (RII). This measure uses suicide rates across the full range of *ranked* incomes, giving a relative risk for the person with the lowest income compared to the person with the highest income. We used regression methods to derive the RIIs (see Mackenbach and Kunst 1997), based on rates of suicide in each quintile (as opposed to tertile) of household income. The results are shown in Table 3 below. As with the rate ratios, there is a trend of increasing RIIs over time for 25−44 and 45−64-year-old males and females, but no clear trend for either 15−24 or 65−77-year-olds.

Table 3: Relative indices of inequality (95 percent confidence intervals) comparing suicide risk of low to high income

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Sex** | * **Age (year)** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * Males | * 15−24 | * 1.75 | * (0.55–5.55) | * 0.83 | * (0.41–1.68) | * 1.31 | * (0.65–2.63) | * 1.04 | * (0.53–2.03) | * 0.81 |
| * 25−44 | * 1.22 | * (0.60–2.47) | * 1.43 | * (0.80–2.56) | * 2.37 | * (1.29–4.36) | * 2.20 | * (1.27–3.81) | * 0.11 |
| * 45−64 | * 1.78 | * (0.76–4.19) | * 2.06 | * (1.04–4.09) | * 3.32 | * (1.35–8.12) | * 2.94 | * (1.31–6.61) | * 0.11 |
| * 65−77 | * 1.39 | * (0.55–3.54) | * 3.05 | * (0.94–9.91) | * 0.99 | * (0.39–2.50) | * 1.28 | * (0.55–2.99) | * 0.61 |
| * Females | * 15−24 | * 0.74 | * (0.07–8.02) | * 1.57 | * (0.31–8.03) | * 0.58 | * (0.12–2.87) | * 0.62 | * (0.17–2.30) | * 0.41 |
| * 25−44 | * 0.47 | * (0.12–1.82) | * 1.29 | * (0.48–3.49) | * 1.37 | * (0.48–3.95) | * 2.35 | * (0.89–6.21) | * 0.08 |
| * 45−64 | * 0.75 | * (0.30–1.87) | * 2.89 | * (0.83–9.99) | * 1.90 | * (0.64–5.67) | * 7.58 | * (0.39–146.9) | * 0.19 |
| * 65−77 | * 1.30 | * (0.30–5.67) | * 0.64 | * (0.13–3.16) | * 1.54 | * (0.32–7.48) | * 0.98 | * (0.22–4.35) | * 0.97 |

For most groups the numbers of deaths are too small to present suicide rates by ethnicity by socioeconomic factor. An exception is 25−44-year-old Māori males, where there are enough suicide deaths among each income tertile in each period to present the results (see Figure 6). Noting that the 95 percent confidence intervals are wide, the trend of increasing suicide rates among all income levels (as found for all ethnic groups combined in Figure 5) appears to be reproduced. Put another way, we do not have evidence that socioeconomic trends within Māori vary from those within the total population (which in turn is dominated by non-Māori non-Pacific).

Figure 6: Suicide trends among 25−44-year-old Māori males, by household income

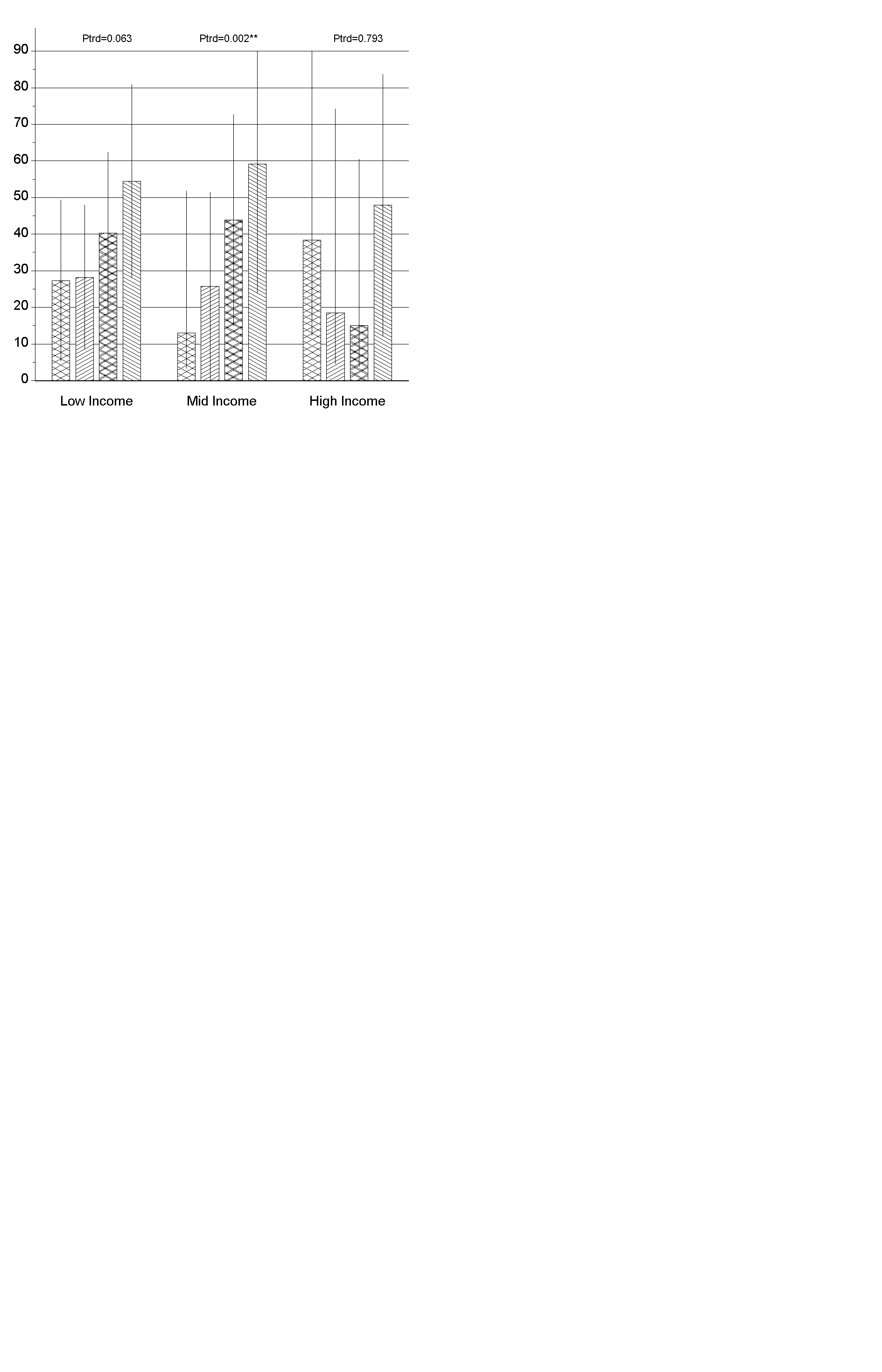


Table 4: Suicide rates (95 percent confidence intervals) per 100,000, by household income

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Household income** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Low income | * 23.6 | * (12.5–34.7) | * 35.4 | * (23.0–47.8) | * 41.7 | * (28.1–55.3) | * 50.3 | * (35.0–65.6) | * 0.008 |
| * Mid income | * 19.2 | * (8.8–29.6) | * 39.3 | * (26.3–52.3) | * 55.3 | * (39.0–71.6) | * 53.0 | * (37.7–68.3) | * 0.063 |
| * High income | * 14.2 | * (6.6–21.8) | * 38.7 | * (26.0–51.4) | * 37.6 | * (23.3–51.9) | * 50.3 | * (31.9–68.7) | * 0.070 |
| * 25−44 | * Low income | * 23.1 | * (15.8–30.4) | * 28.0 | * (20.4–35.6) | * 43.9 | * (34.8–53.0) | * 47.9 | * (38.1–57.7) | * 0.032 |
| * Mid income | * 22.3 | * (15.2–29.4) | * 28.2 | * (20.9–35.5) | * 34.0 | * (25.9–42.1) | * 36.5 | * (28.2–44.8) | * 0.013 |
| * High income | * 19.1 | * (11.9–26.3) | * 22.7 | * (16.0–29.4) | * 23.1 | * (15.9–30.3) | * 28.9 | * (21.8–36.0) | * 0.052 |
| * 45−64 | * Low income | * 24.1 | * (15.9–32.3) | * 37.0 | * (27.3–46.7) | * 37.4 | * (28.1–46.7) | * 29.2 | * (21.8–36.6) | * 0.692 |
| * Mid income | * 15.4 | * (9.0–21.8) | * 25.1 | * (17.4–32.8) | * 20.8 | * (14.3–27.3) | * 25.0 | * (18.3–31.7) | * 0.250 |
| * High income | * 17.7 | * (10.8–24.6) | * 23.6 | * (16.5–30.7) | * 19.1 | * (11.4–26.8) | * 13.4 | * (8.2–18.6) | * 0.353 |
| * 65−77 | * Low income | * 51.9 | * (31.4–72.4) | * 54.1 | * (36.6–71.6) | * 23.1 | * (11.7–34.5) | * 39.4 | * (26.1–52.7) | * 0.512 |
| * Mid income | * 34.3 | * (20.0–48.6) | * 28.3 | * (14.3–42.3) | * 24.2 | * (13.6–34.8) | * 22.9 | * (12.9–32.9) | * 0.042 |
| * High income | * 38.7 | * (21.3–56.1) | * 33.9 | * (19.7–48.1) | * 32.3 | * (18.2–46.4) | * 25.2 | * (13.8–36.6) | * 0.028 |
| * 25−64 | * Low income | * 23.5 | * (18.0–29.0) | * 31.4 | * (25.4–37.4) | * 41.4 | * (34.7–48.1) | * 40.7 | * (34.0–47.4) | * 0.053 |
| * Mid income | * 19.7 | * (14.7–24.7) | * 27.0 | * (21.6–32.4) | * 29.0 | * (23.4–34.6) | * 32.1 | * (26.3–37.9) | * 0.039 |
| * High income | * 18.6 | * (13.4–23.8) | * 23.0 | * (18.1–27.9) | * 21.6 | * (16.3–26.9) | * 22.9 | * (18.1–27.7) | * 0.286 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Low income | * 6.0 | * (0.0–12.0) | * 7.6 | * (1.9–13.3) | * 5.9 | * (1.5–10.3) | * 9.8 | * (3.5–16.1) | * 0.459 |
| * Mid income | * 4.2 | * (1.2–14.9) | * 8.4 | * (2.4–14.4) | * 8.4 | * (2.8–14.0) | * 16.2 | * (8.0–24.4) | * 0.093 |
| * High income | * 3.7 | * (1.2–11.8) | * 8.8 | * (2.1–15.5) | * 7.7 | * (2.3–13.1) | * 14.5 | * (5.5–23.5) | * 0.105 |
| * 25−44 | * Low income | * 5.7 | * (2.4–9.0) | * 9.7 | * (5.5–13.9) | * 8.9 | * (4.6–13.2) | * 15.7 | * (11.0–20.4) | * 0.088 |
| * Mid income | * 5.5 | * (2.2–8.8) | * 10.5 | * (6.0–15.0) | * 7.3 | * (3.9–10.7) | * 5.9 | * (2.9–8.9) | * 0.936 |
| * High income | * 9.4 | * (4.8–14.0) | * 7.1 | * (3.2–11.0) | * 5.4 | * (2.8–8.0) | * 8.9 | * (5.1–12.7) | * 0.806 |
| * 45−64 | * Low income | * 12.3 | * (6.9–17.7) | * 12.4 | * (7.4–17.4) | * 13.3 | * (7.7–18.9) | * 8.0 | * (4.1–11.9) | * 0.234 |
| * Mid income | * 9.2 | * (4.6–13.8) | * 11.2 | * (6.6–15.8) | * 7.9 | * (4.0–11.8) | * 4.8 | * (2.1–7.5) | * 0.131 |
| * High income | * 16.1 | * (9.7–22.5) | * 6.4 | * (2.7–10.1) | * 8.9 | * (4.2–13.6) | * 3.7 | * (1.5–5.9) | * 0.174 |
| * 65−77 | * Low income | * 12.5 | * (4.2–20.8) | * 8.2 | * (2.1–14.3) | * 9.0 | * (3.4–14.6) | * 8.3 | * (3.0–13.6) | * 0.334 |
| * Mid income | * 9.5 | * (2.4–16.6) | * 6.6 | * (0.5–12.7) | * 7.1 | * (1.1–13.1) | * 7.4 | * (1.9–12.9) | * 0.499 |
| * High income | * 10.6 | * (3.6–17.6) | * 16.3 | * (6.0–26.6) | * 8.6 | * (1.8–15.4) | * 6.2 | * (1.3–11.1) | * 0.258 |
| * 25−64 | * Low income | * 8.1 | * (5.2–11.0) | * 10.7 | * (7.5–13.9) | * 10.5 | * (7.1–13.9) | * 12.8 | * (9.5–16.1) | * 0.059 |
| * Mid income | * 6.9 | * (4.2–9.6) | * 10.7 | * (7.4–14.0) | * 7.5 | * (4.9–10.1) | * 5.5 | * (3.4–7.6) | * 0.487 |
| * High income | * 11.9 | * (8.2–15.6) | * 6.9 | * (4.1–9.7) | * 6.7 | * (4.3–9.1) | * 6.9 | * (4.4–9.4) | * 0.305 |

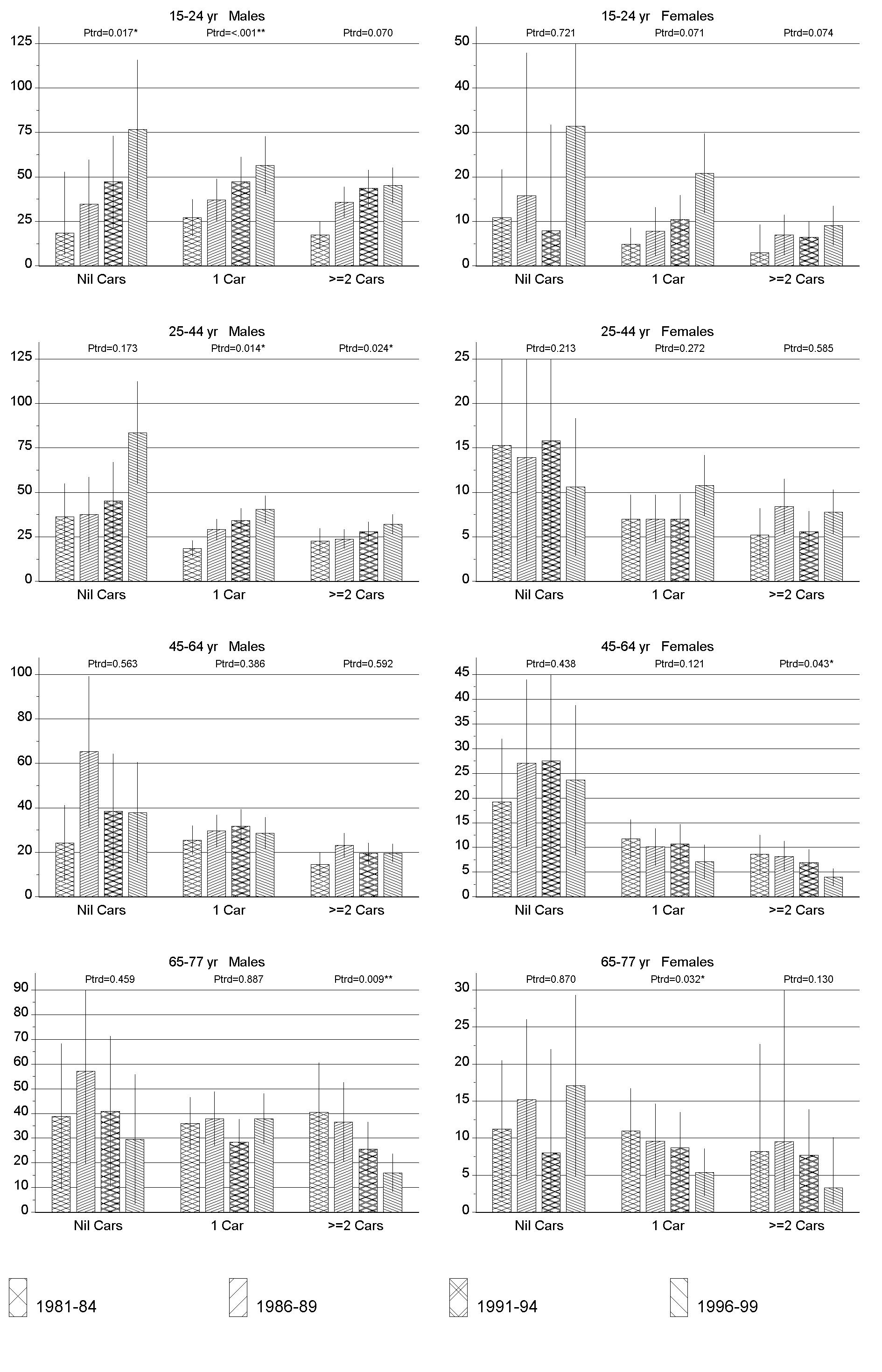
## Car access

Figure 7 below shows the age-standardised rates of suicide per 100,000 person-years for people living in households with access to one, two or no cars. Car access is a proxy for both asset wealth and access to community resources (Macintyre et al 1998). The actual rates (and 95 percent confidence intervals) are presented in Table 5, and standardised rate ratios and differences are presented in Tables 16 and 17 of the Appendix. Car access has been found to be a strong predictor of health status. However, note that the number of people living in households with no car access is small, as reflected by the wide confidence intervals in Figure 7.

Examining Figure 7, there are some similarities in the patterns by household income. Suicide rates have increased over time within all categories of car access among 15−24-year-olds and 25−44-year-old males. Also similar to the pattern by household income, there is a notable increase (84 percent) over time in the suicide rate among 25−44-year-old males with no access to a car compared to a lesser increase (40 percent) among 25−44-year-old males with access to two or more cars. Patterns are less clear for 45−64 and 65−77-year-olds.

Comparing across car access groups, people with no access to a car tended to have higher suicide rates than people with access to two or more cars within each time period. There is some evidence of increasing SRRs comparing nil to two or more car access over time (see Table 16, page 50), but this is not as compelling as the increasing SRRs over time by household income.

Figure 7: Suicide trends, by household car access, sex and age



Notes: Rates are per 100,000 person-years of follow-up, and age- and ethnicity-standardised (five-year age groups, and Māori, Pacific, non-Māori non-Pacific) using the 1991 census as the standard population. Error bars are 95% confidence intervals.

Table 5: Suicide rates (95 percent confidence intervals) per 100,000, by household car access

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Car access** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Nil cars | * 18.5 | * (6.5–52.7) | * 34.8 | * (9.9–59.7) | * 47.3 | * (21.5–73.1) | * 76.6 | * (37.5–115.7) | * 0.017 |
| * 1 car | * 27.1 | * (16.8–37.4) | * 37.1 | * (25.4–48.8) | * 47.2 | * (33.3–61.1) | * 56.6 | * (40.4–72.8) | * <.001 |
| * ≥ 2 cars | * 17.4 | * (9.8–25.0) | * 35.9 | * (27.4–44.4) | * 43.6 | * (33.4–53.8) | * 45.2 | * (35.2–55.2) | * 0.070 |
| * 25−44 | * Nil cars | * 36.2 | * (17.6–54.8) | * 37.6 | * (16.7–58.5) | * 45.2 | * (23.5–66.9) | * 83.6 | * (54.9–112.3) | * 0.173 |
| * 1 car | * 18.5 | * (14.0–23.0) | * 29.1 | * (23.2–35.0) | * 34.3 | * (27.7–40.9) | * 40.4 | * (32.6–48.2) | * 0.014 |
| * ≥ 2 cars | * 22.7 | * (15.7–29.7) | * 23.8 | * (18.5–29.1) | * 28.0 | * (22.7–33.3) | * 32.0 | * (26.5–37.5) | * 0.024 |
| * 45−64 | * Nil cars | * 24.2 | * (7.2–41.2) | * 65.3 | * (31.5–99.1) | * 38.5 | * (12.8–64.2) | * 37.9 | * (15.3–60.5) | * 0.563 |
| * 1 car | * 25.5 | * (19.1–31.9) | * 29.6 | * (22.3–36.9) | * 31.8 | * (24.3–39.3) | * 28.6 | * (21.5–35.7) | * 0.386 |
| * ≥ 2 cars | * 14.6 | * (9.2–20.0) | * 23.2 | * (17.7–28.7) | * 19.5 | * (14.8–24.2) | * 19.7 | * (15.7–23.7) | * 0.592 |
| * 65−77 | * Nil cars | * 38.8 | * (9.4–68.2) | * 57.0 | * (19.5–94.5) | * 40.8 | * (10.4–71.2) | * 29.6 | * (3.4–55.8) | * 0.459 |
| * 1 car | * 36.0 | * (25.4–46.6) | * 37.9 | * (27.1–48.7) | * 28.4 | * (19.1–37.7) | * 37.9 | * (27.8–48.0) | * 0.887 |
| * ≥ 2 cars | * 40.5 | * (20.6–60.4) | * 36.6 | * (20.6–52.6) | * 25.6 | * (14.7–36.5) | * 16.0 | * (8.3–23.7) | * 0.009 |
| * 25−64 | * Nil cars | * 31.6 | * (18.4–44.8) | * 48.2 | * (29.9–66.5) | * 42.6 | * (26.0–59.2) | * 66.1 | * (46.4–85.8) | * 0.114 |
| * 1 car | * 21.2 | * (17.5–24.9) | * 29.3 | * (24.7–33.9) | * 33.4 | * (28.4–38.4) | * 35.9 | * (30.3–41.5) | * 0.029 |
| * ≥ 2 cars | * 19.6 | * (14.8–24.4) | * 23.6 | * (19.7–27.5) | * 24.8 | * (21.1–28.5) | * 27.3 | * (23.6–31.0) | * 0.025 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Nil cars | * 10.9 | * (0.1–21.7) | * 15.8 | * (5.2–47.9) | * 7.9 | * (2.0–31.7) | * 31.4 | * (6.5–56.3) | * 0.721 |
| * 1 car | * 4.9 | * (1.3–8.5) | * 7.8 | * (2.4–13.2) | * 10.4 | * (4.9–15.9) | * 20.8 | * (11.9–29.7) | * 0.071 |
| * ≥ 2 cars | * 3.0 | * (1.0–9.3) | * 7.0 | * (2.5–11.5) | * 6.5 | * (3.0–10.0) | * 9.1 | * (4.7–13.5) | * 0.074 |
| * 25−44 | * Nil cars | * 15.3 | * (2.8–27.8) | * 13.9 | * (2.3–25.5) | * 15.8 | * (3.7–27.9) | * 10.6 | * (2.9–18.3) | * 0.213 |
| * 1 car | * 7.0 | * (4.3–9.7) | * 7.0 | * (4.3–9.7) | * 7.0 | * (4.2–9.8) | * 10.8 | * (7.4–14.2) | * 0.272 |
| * ≥ 2 cars | * 5.2 | * (2.2–8.2) | * 8.4 | * (5.3–11.5) | * 5.6 | * (3.3–7.9) | * 7.8 | * (5.3–10.3) | * 0.585 |
| * 45−64 | * Nil cars | * 19.2 | * (6.5–31.9) | * 27.0 | * (10.1–43.9) | * 27.5 | * (8.6–46.4) | * 23.6 | * (8.5–38.7) | * 0.438 |
| * 1 car | * 11.7 | * (7.8–15.6) | * 10.1 | * (6.4–13.8) | * 10.7 | * (6.7–14.7) | * 7.1 | * (3.7–10.5) | * 0.121 |
| * ≥ 2 cars | * 8.6 | * (4.7–12.5) | * 8.2 | * (5.1–11.3) | * 6.9 | * (4.2–9.6) | * 4.0 | * (2.3–5.7) | * 0.043 |
| * 65−77 | * Nil cars | * 11.2 | * (1.9–20.5) | * 15.2 | * (4.4–26.0) | * 8.0 | * (2.9–22.0) | * 17.1 | * (4.9–29.3) | * 0.870 |
| * 1 car | * 11.0 | * (5.3–16.7) | * 9.6 | * (4.6–14.6) | * 8.7 | * (3.9–13.5) | * 5.4 | * (2.2–8.6) | * 0.032 |
| * ≥ 2 cars | * 8.2 | * (3.0–22.7) | * 9.5 | * (2.9–31.1) | * 7.7 | * (1.5–13.9) | * 3.3 | * (1.1–10.1) | * 0.130 |
| * 25−64 | * Nil cars | * 16.7 | * (7.6–25.8) | * 18.8 | * (9.1–28.5) | * 20.1 | * (9.8–30.4) | * 15.5 | * (8.1–22.9) | * 0.687 |
| * 1 car | * 8.8 | * (6.6–11.0) | * 8.2 | * (6.0–10.4) | * 8.4 | * (6.1–10.7) | * 9.4 | * (6.9–11.9) | * 0.554 |
| * ≥ 2 cars | * 6.5 | * (4.1–8.9) | * 8.4 | * (6.1–10.7) | * 6.1 | * (4.3–7.9) | * 6.4 | * (4.7–8.1) | * 0.607 |

## Highest qualification

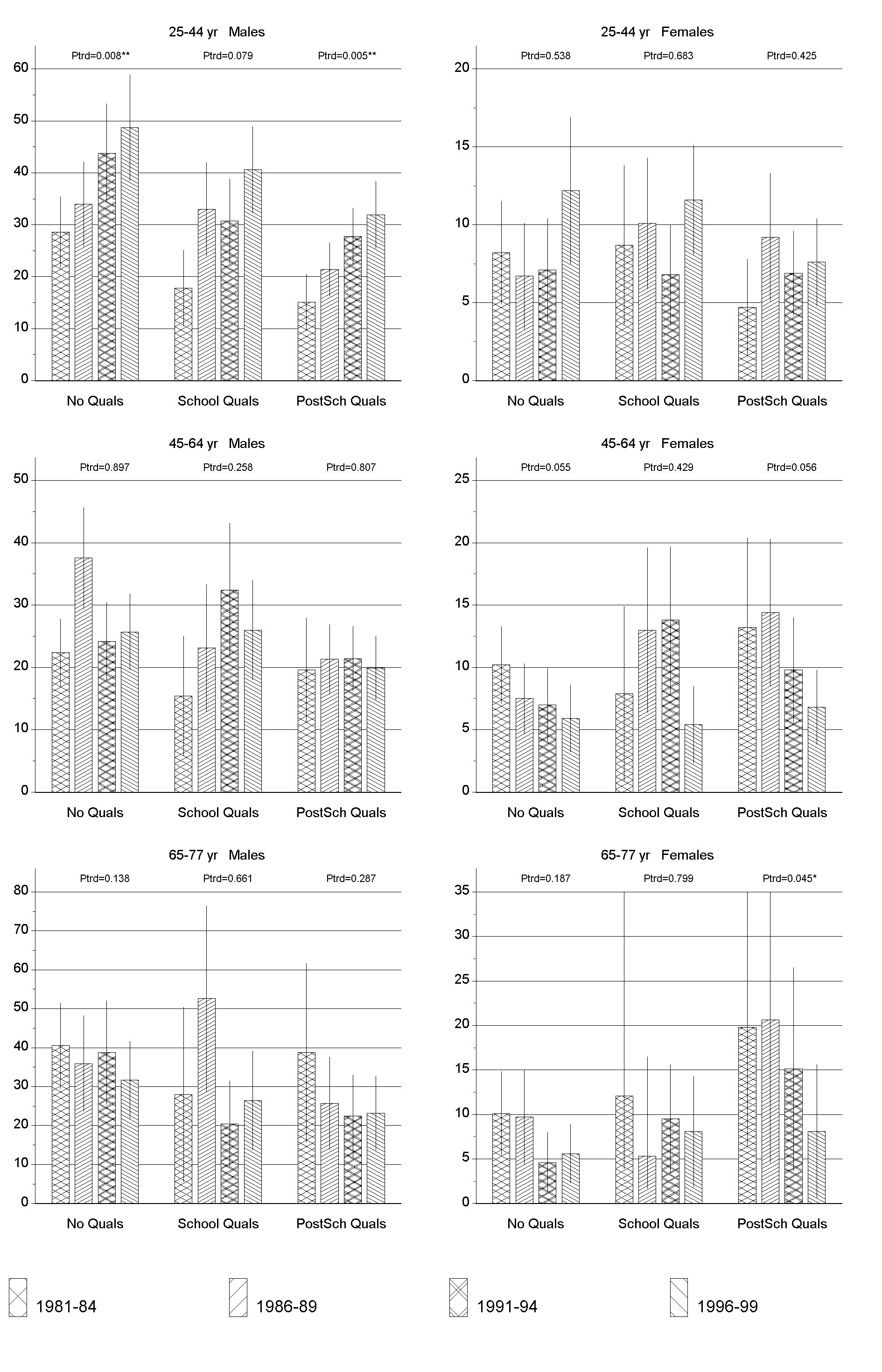
Figure 8 shows the age-standardised rates of suicide per 100,000 person-years for people with no qualifications, school and post-school qualifications. The actual standardised rates (and 95 percent confidence intervals) are presented in Table 6, and standardised rate ratios and differences are presented in Tables 18 and 19 of the Appendix. Note that there are pronounced cohort effects with education, with older cohorts having more people with no qualifications. Thus, what qualifications mean for 25-year-olds compared to 70-year-olds is likely to differ. Results for 15−24-year-olds are not presented because many people in this age band would still be acquiring educational qualifications, making results difficult to interpret.

Regarding trends over time, suicide rates approximately doubled for all three educational groups among 25−44-year-old males (p for trend = 0.08 and less). Conversely, there were downward trends in female suicide rates among 45−64-year-olds in the no-qualification and post-school groups and among 65−77-year-old males and females with post-school qualifications. There was no clear pattern among 45−64-year-old males.

Comparing across educational groups, among males there was a tendency to higher suicide rates among those with no formal educational qualification in all time periods and age groups – although not uniformly so. The relative difference in suicide rates by education among males did not vary over time (see SRRs in Table 18).

Among females there was a (reverse) tendency for higher suicide rates among more educated females among 65−77-year olds, and possibly 45−64-year-olds. For example, SRRs comparing post-school to nil qualifications ranged from 0.87 (95 percent confidence interval 0.46−1.64) to 0.52 (0.30−0.90) among 45−64-year-olds, and from 0.69 (0.23−2.07) to 0.30 (0.11−0.88) among 45−64-year-olds. There was no clear difference in suicide rates by educational qualification among 25−44-year-old females.

Figure 8: Suicide trends, by highest educational qualification, sex and age



Notes: Rates are per 100,000 person-years of follow-up, and age- and ethnicity-standardised (five-year age groups, and Māori, Pacific, non-Māori non-Pacific) using the 1991 census as the standard population. Error bars are 95% confidence intervals.

Table 6: Suicide rates (95 percent confidence intervals) per 100,000, by highest qualification

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Highest qualification** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * No qualifications | * 28.6 | * (21.8–35.4) | * 34.0 | * (25.9–42.1) | * 43.8 | * (34.3–53.3) | * 48.7 | * (38.5–58.9) | * 0.008 |
| * School qualifications | * 17.8 | * (10.5–25.1) | * 33.0 | * (24.0–42.0) | * 30.7 | * (22.6–38.8) | * 40.6 | * (32.3–48.9) | * 0.079 |
| * Post-school qualifications | * 15.1 | * (9.7–20.5) | * 21.4 | * (16.3–26.5) | * 27.8 | * (22.4–33.2) | * 31.9 | * (25.4–38.4) | * 0.005 |
| * 45−64 | * No qualifications | * 22.4 | * (17.0–27.8) | * 37.6 | * (29.5–45.7) | * 24.2 | * (18.0–30.4) | * 25.7 | * (19.6–31.8) | * 0.897 |
| * School qualifications | * 15.4 | * (5.8–25.0) | * 23.1 | * (12.9–33.3) | * 32.4 | * (21.7–43.1) | * 26.0 | * (18.0–34.0) | * 0.258 |
| * Post-school qualifications | * 19.6 | * (11.3–27.9) | * 21.3 | * (15.7–26.9) | * 21.4 | * (16.2–26.6) | * 19.9 | * (14.8–25.0) | * 0.807 |
| * 65−77 | * No qualifications | * 40.5 | * (29.5–51.5) | * 35.9 | * (23.6–48.2) | * 38.7 | * (25.4–52.0) | * 31.7 | * (21.8–41.6) | * 0.138 |
| * School qualifications | * 28.0 | * (5.6–50.4) | * 52.6 | * (28.8–76.4) | * 20.4 | * (9.4–31.4) | * 26.4 | * (13.7–39.1) | * 0.661 |
| * Post-school qualifications | * 38.7 | * (15.7–61.7) | * 25.7 | * (13.8–37.6) | * 22.4 | * (11.8–33.0) | * 23.2 | * (13.7–32.7) | * 0.287 |
| * 25−64 | * No qualifications | * 26.2 | * (21.5–30.9) | * 35.4 | * (29.5–41.3) | * 36.3 | * (30.0–42.6) | * 39.9 | * (33.2–46.6) | * 0.063 |
| * School qualifications | * 16.9 | * (11.1–22.7) | * 29.2 | * (22.4–36.0) | * 31.3 | * (24.8–37.8) | * 35.0 | * (29.0–41.0) | * 0.060 |
| * Post-school qualifications | * 16.8 | * (12.2–21.4) | * 21.4 | * (17.6–25.2) | * 25.3 | * (21.4–29.2) | * 27.3 | * (22.8–31.8) | * 0.015 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * No qualifications | * 8.2 | * (4.9–11.5) | * 6.7 | * (3.3–10.1) | * 7.1 | * (3.8–10.4) | * 12.2 | * (7.5–16.9) | * 0.538 |
| * School qualifications | * 8.7 | * (3.6–13.8) | * 10.1 | * (5.9–14.3) | * 6.8 | * (3.6–10.0) | * 11.6 | * (8.1–15.1) | * 0.683 |
| * Post-school qualifications | * 4.7 | * (1.6–7.8) | * 9.2 | * (5.1–13.3) | * 6.9 | * (4.2–9.6) | * 7.6 | * (4.8–10.4) | * 0.425 |
| * 45−64 | * No qualifications | * 10.2 | * (7.1–13.3) | * 7.5 | * (4.7–10.3) | * 7.0 | * (4.1–9.9) | * 5.9 | * (3.2–8.6) | * 0.055 |
| * School qualifications | * 7.9 | * (0.9–14.9) | * 13.0 | * (6.4–19.6) | * 13.8 | * (7.9–19.7) | * 5.4 | * (2.3–8.5) | * 0.429 |
| * Post-school qualifications | * 13.2 | * (6.0–20.4) | * 14.4 | * (8.5–20.3) | * 9.8 | * (5.6–14.0) | * 6.8 | * (3.8–9.8) | * 0.056 |
| * 65−77 | * No qualifications | * 10.1 | * (5.4–14.8) | * 9.7 | * (4.4–15.0) | * 4.6 | * (1.2–8.0) | * 5.6 | * (2.3–8.9) | * 0.187 |
| * School qualifications | * 12.1 | * (3.9–37.7) | * 5.3 | * (1.7–16.5) | * 9.5 | * (3.4–15.6) | * 8.1 | * (1.9–14.3) | * 0.799 |
| * Post-school qualifications | * 19.8 | * (6.5–60.5) | * 20.6 | * (4.6–36.6) | * 15.1 | * (3.7–26.5) | * 8.1 | * (0.6–15.6) | * 0.045 |
| * 25−64 | * No qualifications | * 9.0 | * (6.7–11.3) | * 7.0 | * (4.7–9.3) | * 7.1 | * (4.8–9.4) | * 9.8 | * (6.7–12.9) | * 0.981 |
| * School qualifications | * 8.4 | * (4.3–12.5) | * 11.2 | * (7.6–14.8) | * 9.4 | * (6.4–12.4) | * 9.3 | * (6.8–11.8) | * 0.915 |
| * Post-school qualifications | * 7.9 | * (4.6–11.2) | * 11.2 | * (7.8–14.6) | * 8.0 | * (5.7–10.3) | * 7.3 | * (5.2–9.4) | * 0.489 |

## Labour-force status

Figure 9 shows the age-standardised rates of suicide per 100,000 person-years for employed and unemployed people, and people not in the active labour force. The actual standardised rates (and 95 percent confidence intervals) are presented in Table 7, and standardised rate ratios and differences are presented in Tables 20 and 21 of the Appendix. Note that the category ‘non-labour force’ includes people in a range of situations that would lead them to be classified as neither unemployed nor employed. This would include homemakers, students, retired people, and chronically ill people, including some of those with chronic mental illness. With regard to any effect of labour-force status on suicide, the important comparison is between the employed and unemployed groups.

Regarding trends over time, 18−24-year-olds’ suicide rates increased in all labour-force status groups (except unemployed 18−24-year-old males), but the most notable increases were among the employed*.* Suicide rates among employed 18−24-year-old males increased by 187 percent between 1981−84 and 1996−99 (p for trend = 0.04), and by 221 percent among females (p for trend < 0.01). The relative increases among the non-active labour force were still sizeable, but not as large.

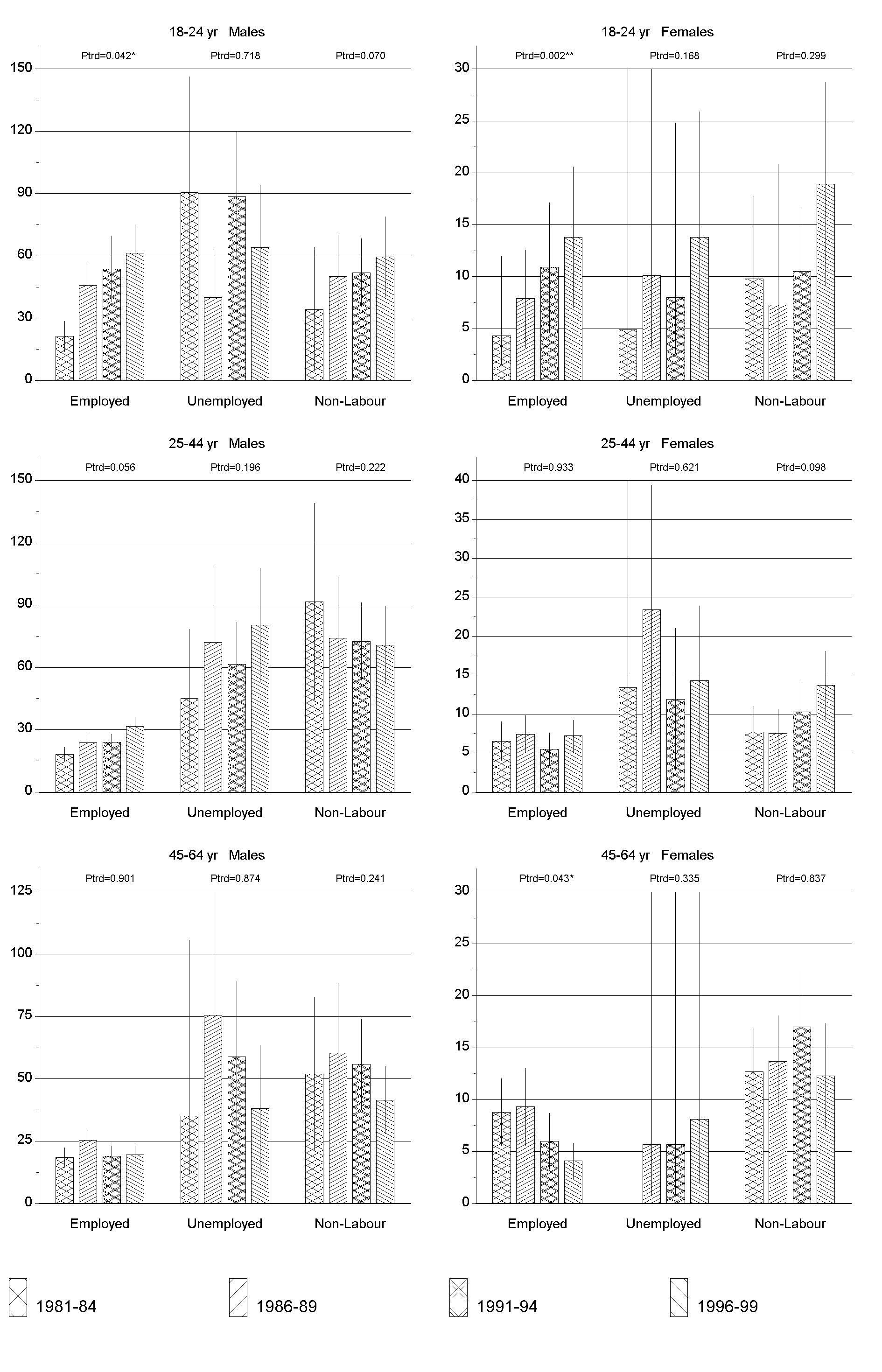
Among 25−44-year-old males there was little change over time in suicide rates among the non-active, but a 73 percent increase among employed males (p for trend = 0.06).

There were no clear trends in suicide rates by labour-force status among 45−64-year-olds, except among employed 45−64-year-old females, who enjoyed a halving of suicide rates over time (p for trend = 0.04).

Comparing across labour-force status groups, unemployed and non-active 25−44 and 45−64–year-old males had suicide rates usually two to three times greater than employed males in all four cohorts (SRRs in Table 20). A similar pattern, although not as clear, was present among 25−44-year-old females. Among 45−64-year-old females, rates were consistently highest among the non-active, but too statistically imprecise among the unemployed for confident interpretation.

Unemployed 18−24-year-old males had elevated suicide rates compared to the employed during 1981−84 (SRR 4.25, 95 percent confidence interval 2.10−8.60) and 1991−94 (1.65, 1.04−2.61), but not during the two other periods.

Figure 9: Suicide trends, by labour-force status, sex and age



Notes: Rates are per 100,000 person-years of follow-up, and age- and ethnicity-standardised (five-year age groups, and Māori, Pacific, non-Māori non-Pacific) using the 1991 census as the standard population. Error bars are 95% confidence intervals.

Table 7: Suicide rates (95 percent confidence intervals) per 100,000, by labour-force status

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Labour-force status** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 18−24 | * Employed | * 21.3 | * (14.0–28.6) | * 45.8 | * (35.2–56.4) | * 53.8 | * (38.0–69.6) | * 61.4 | * (47.8–75.0) | * 0.042 |
| * Unemployed | * 90.6 | * (34.9–146.3) | * 39.9 | * (16.6–63.2) | * 88.6 | * (57.1–120.1) | * 64.0 | * (33.8–94.2) | * 0.718 |
| * Non-labour | * 34.2 | * (4.4–64.0) | * 50.0 | * (29.9–70.1) | * 52.0 | * (35.8–68.2) | * 59.5 | * (40.2–78.8) | * 0.070 |
| * 25−44 | * Employed | * 18.2 | * (14.9–21.5) | * 23.7 | * (20.1–27.3) | * 23.9 | * (20.1–27.7) | * 31.7 | * (27.3–36.1) | * 0.056 |
| * Unemployed | * 45.0 | * (11.6–78.4) | * 72.0 | * (35.8–108.2) | * 61.5 | * (41.2–81.8) | * 80.4 | * (53.0–107.8) | * 0.196 |
| * Non-labour | * 91.7 | * (44.3–139.1) | * 74.0 | * (44.6–103.4) | * 72.5 | * (53.8–91.2) | * 70.8 | * (52.1–89.5) | * 0.222 |
| * 45−64 | * Employed | * 18.4 | * (14.4–22.4) | * 25.4 | * (20.9–29.9) | * 19.0 | * (14.9–23.1) | * 19.5 | * (15.9–23.1) | * 0.901 |
| * Unemployed | * 35.0 | * (11.6–105.7) | * 75.5 | * (18.8–132.2) | * 58.9 | * (28.7–89.1) | * 38.1 | * (12.8–63.4) | * 0.874 |
| * Non-labour | * 52.0 | * (21.2–82.8) | * 60.3 | * (32.4–88.2) | * 55.8 | * (37.6–74.0) | * 41.4 | * (27.9–54.9) | * 0.241 |
| * 25−64 | * Employed | * 18.3 | * (15.7–20.9) | * 24.3 | * (21.5–27.1) | * 22.1 | * (19.3–24.9) | * 27.0 | * (23.9–30.1) | * 0.157 |
| * Unemployed | * 41.2 | * (15.8–66.6) | * 73.3 | * (42.2–104.4) | * 60.5 | * (43.5–77.5) | * 64.3 | * (44.8–83.8) | * 0.359 |
| * Non-labour | * 76.5 | * (45.0–108.0) | * 68.8 | * (47.7–89.9) | * 66.1 | * (52.6–79.6) | * 59.5 | * (46.8–72.2) | * 0.018 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 18−24 | * Employed | * 4.3 | * (1.5–12.0) | * 7.9 | * (3.2–12.6) | * 10.9 | * (4.7–17.1) | * 13.8 | * (7.0–20.6) | * 0.002 |
| * Unemployed | * 4.9 | * (0.7–34.5) | * 10.1 | * (3.2–31.7) | * 8.0 | * (2.6–24.8) | * 13.8 | * (1.7–25.9) | * 0.168 |
| * Non-labour | * 9.8 | * (1.9–17.7) | * 7.3 | * (2.6–20.8) | * 10.5 | * (4.2–16.8) | * 18.9 | * (9.1–28.7) | * 0.299 |
| * 25−44 | * Employed | * 6.5 | * (4.0–9.0) | * 7.4 | * (5.0–9.8) | * 5.5 | * (3.4–7.6) | * 7.2 | * (5.2–9.2) | * 0.933 |
| * Unemployed | * 13.4 | * (1.9–94.7) | * 23.4 | * (7.4–39.4) | * 11.9 | * (2.8–21.0) | * 14.3 | * (4.7–23.9) | * 0.621 |
| * Non-labour | * 7.7 | * (4.4–11.0) | * 7.5 | * (4.4–10.6) | * 10.3 | * (6.3–14.3) | * 13.7 | * (9.3–18.1) | * 0.098 |
| * 45−64 | * Employed | * 8.8 | * (5.6–12.0) | * 9.3 | * (5.6–13.0) | * 6.0 | * (3.3–8.7) | * 4.1 | * (2.4–5.8) | * 0.043 |
| * Unemployed | * 0.0 | * (0.0–0.0) | * 5.7 | * (0.8–40.0) | * 5.7 | * (0.8–39.9) | * 8.1 | * (2.0–32.2) | * 0.335 |
| * Non-labour | * 12.7 | * (8.5–16.9) | * 13.7 | * (9.3–18.1) | * 17.0 | * (11.6–22.4) | * 12.3 | * (7.3–17.3) | * 0.837 |
| * 25−64 | * Employed | * 7.4 | * (5.4–9.4) | * 8.1 | * (6.1–10.1) | * 5.7 | * (4.1–7.3) | * 6.1 | * (4.7–7.5) | * 0.265 |
| * Unemployed | * 8.4 | * (1.2–59.2) | * 16.8 | * (6.0–27.6) | * 9.6 | * (2.6–16.6) | * 12.0 | * (4.7–19.3) | * 0.894 |
| * Non-labour | * 9.6 | * (7.0–12.2) | * 9.8 | * (7.2–12.4) | * 12.8 | * (9.6–16.0) | * 13.2 | * (9.9–16.5) | * 0.077 |

## Multivariable results

Tables 8 and 9 below present results for 25−44 and 45−64-year-old males from Poisson regression models that include a range of variables. Note that there were insufficient suicide deaths among 18−24-year-olds, 65−77-year-olds and females of all age groups to present reliable results. (Greater numbers in these groups would have permitted exploration of, for example, the apparent increased suicide risk among 45−64 and 65−77-year-old females with post-school qualifications.) Further, adjusting for Māori, Pacific and non-Māori non-Pacific ethnic groups was not possible due to the small number of Pacific suicide deaths – particularly in the early 1980s. Therefore, analyses are restricted to Māori and non-Māori non-Pacific people. Finally, the analyses are further restricted to those census respondents with complete data for all variables: 83.7 percent among 25−44-year-olds and 88.7 percent among 45−64–year-olds.

For each of the two age groups, a baseline model (Model 0) is presented, with Māori compared to non-Māori non-Pacific rate ratios (adjusted for five-year age group). Models 1 to 5 then model separately each of the five social factors (marital status, household income, car access, highest qualification and labour-force status). Model 6 includes all variables (and household tenure as well – a marker of asset wealth).

Some selection bias by ethnicity has occurred during the data restrictions as the rate ratios in Tables 8 and 9 for Māori compared to non-Māori non-Pacific tend to vary from those for the full cohort shown in Table 10 (page 43). This is most pronounced for 45−64-year-old men in the 1981−84 cohort, when ethnicity data was less reliable.

Multivariable analysis provides the opportunity to scrutinise the data with a view to learning more about what might underlie the differences in *trends* between groups. Because these multivariable analyses include many demographic and socioeconomic factors, it is important that this scrutiny is conducted systematically on the basis of clear *a priori* hypotheses or questions.

On the basis of the analyses presented so far in this report, the following questions were considered to be relevant.

* **Do socioeconomic factors make a contribution to the ethnic differences in suicide rates among 25−44-year-olds? Do they make a contribution to the varying suicide trends among different ethnic groups?**

In order to answer this question we use several statistical models in logical order, treating ethnicity as an ‘upstream’ or ‘distal’ variable, and the socioeconomic factors as ‘downstream’ or ‘proximal’ variables. The aim is to explore some of the mediating mechanisms whereby, in this case, suicide is patterned by ethnicity. Such an approach has been proposed elsewhere (Victora et al 1997), although any such attempt to tease apart ‘direct’ and ‘indirect’ effects is problematic (Robins and Greenland 1992; Cole and Hernán 2002). However, if we wish to understand mechanisms of effect, we have to (cautiously) use the methods available and the given data (Blakely 2002a).

The approach is as follows (Victora et al 1997). First we examine the model that controls only for ethnicity (Model 0, Table 8) and compare the across-cohorts trend in suicide rate ratios in Model 0 with the rate ratio trend for Māori in each subsequent model. The multivariable model that includes a range of socioeconomic factors will, compared to the ethnicity-only model, indicate the proportion of the ethnicity−suicide association that is explained by these socioeconomic factors. For example, if Māori suicide rates (adjusting for age only) were twice those of non-Māori (ie, relative risk = 2), and after adjusting for many socioeconomic factors the relative risk reduced to 1.5, we could conclude that half of the ethnicity−suicide association was *due* to socioeconomic factors. A critical issue is the meaning of the word ‘due’. In this case, because socioeconomic factors are unlikely to determine one’s ethnicity, socioeconomic factors are a potential *explanation* for the association.

* **Is the apparent trend of increasing suicide inequalities by income explained by other socioeconomic factors?**

In this instance we are not looking at the multivariable models separately at each point in time, but trying to make sense of any variation in *trends* between the simple (ie, Model 2 with income and ethnicity) and the multivariable Model 6. In particular, we are hypothesising that variables correlated with income become more correlated over time (regardless of whether they are confounders or intermediary variables), and that this increased accumulation (or increased multiple vulnerabilities/resilience) might explain why the association of income with suicide changes over time.

* **Is the association of unemployment with suicide due to associated low socioeconomic position?**

To answer this question we use the same approach. However, this time we might think of some social factors being confounders (ie, they are not on the causal pathway from unemployment to suicide). For example, education (usually completed by age 25) is a determinant of labour-force status, and may have an association with suicide independent of labour-force status. Therefore education is a possible confounder. On the other hand, income is determined by labour-force status and is therefore a potential pathway from labour-force status to suicide. Therefore, a model including labour-force status and a full range of socioeconomic factors requires careful interpretation.

* **Does the protective effect of being married remain after adjusting for socioeconomic factors?**

Using the currently married as the comparison group, we simply observe any changes in rate ratios for each cohort when Model 6 control conditions are applied.

## Examination of results by age group

### 25−44-year-old males

#### Ethnicity

As demonstrated in Table 10, and elsewhere (Ferguson et al 2003; Ajwani et al 2003), Māori 25−44-year-olds’ suicide rates increased from less than non-Māori non-Pacific in the early 1980s to greater than non-Māori non-Pacific in the late 1990s. This pattern is roughly present in Model 0 in Table 8 below, although some selection bias has introduced a spurious increased risk for Māori compared to non-Māori non-Pacific in 1981−84. Focusing, however, on 1996−99, where our *a priori* interest lies, we see that a relative risk of 1.51 in Model 0 reduces to 1.13 in Model 6. Thus it appears that socioeconomic factors explain much of the excess suicide rate among 25−44-year-old Māori males in the late 1990s.

Turning our attention to patterns over time, we note that in a model that fully adjusts for socioeconomic factors (Model 6) there is, on average and allowing for the 95 percent confidence intervals, no substantive difference in suicide risk by ethnicity over and above that explained by the increasing socioeconomic disadvantage of Māori men over time. Thus it appears that the increasing rates of 25−44-year-old Māori male suicide might be partly explained by increasing socioeconomic deprivation over time among this sub-population.

#### Household income

The increasing rate ratios comparing high to low income in Model 2 become stable (ie, no increase over time) in Model 6. One possible explanation for this pattern is that the observed widening of suicide inequalities by income is explained by factors that are (increasingly over time) correlated with income (eg, labour-force status, education). This would be a type of clustering effect, whereby multiple socioeconomic disadvantage among low-income people increases over time (Blakely et al 2003).

#### Labour-force status

Except for 1981−84, the association of unemployment (and non-active labour-force status) with suicide risk remains strong during all periods after controlling for socioeconomic factors.

#### Marital status

Being married is protective against suicide after controlling for socioeconomic factors during all periods.

Table 8: Rate ratios (95 percent confidence intervals) from Poisson regression models: 25−44-year-old males

| * **Variable** | * **Value** | * **1981–84** | | * **1986–89** | | * **1991–94** | | * **1996–99** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Model 0: Ethnicity** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.29 | * (0.67–2.46) | * 0.96 | * (0.53–1.74) | * 0.95 | * (0.58–1.56) | * 1.51 | * (1.00–2.26) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * **Model 1: Ethnicity and marital status** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.27 | * (0.66–2.42) | * 0.92 | * (0.51–1.66) | * 0.89 | * (0.54–1.46) | * 1.38 | * (0.92–2.08) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Marital status | * Never married | * 1.81 | * (1.09–3.01) | * 2.42 | * (1.63–3.59) | * 2.33 | * (1.67–3.26) | * 2.15 | * (1.54–2.99) |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Separated, divorced and widowed | * 2.49 | * (1.42–4.39) | * 1.87 | * (1.08–3.25) | * 1.61 | * (1.01–2.56) | * 3.01 | * (2.00–4.53) |
| * **Model 2: Ethnicity and household income** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.21 | * (0.63–2.33) | * 0.92 | * (0.50–1.66) | * 0.83 | * (0.50–1.37) | * 1.38 | * (0.92–2.09) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Household income | * Low income | * 1.39 | * (0.85–2.26) | * 1.32 | * (0.85–2.04) | * 1.99 | * (1.38–2.87) | * 1.72 | * (1.22–2.44) |
| * Mid income | * 1.09 | * (0.66–1.80) | * 1.62 | * (1.08–2.44) | * 1.54 | * (1.05–2.24) | * 1.52 | * (1.06–2.18) |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * **Model 3: Ethnicity and car access** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.25 | * (0.65–2.39) | * 0.91 | * (0.50–1.67) | * 0.87 | * (0.52–1.43) | * 1.34 | * (0.89–2.02) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Car access | * Nil cars | * 1.55 | * (0.81–2.98) | * 1.46 | * (0.75–2.87) | * 1.89 | * (1.07–3.35) | * 2.62 | * (1.63–4.22) |
| * 1 car | * 0.80 | * (0.52–1.22) | * 1.14 | * (0.81–1.60) | * 1.28 | * (0.95–1.71) | * 1.48 | * (1.11–1.97) |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * **Model 4: Ethnicity and highest qualification** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.11 | * (0.58–2.16) | * 0.89 | * (0.49–1.63) | * 0.81 | * (0.49–1.34) | * 1.34 | * (0.89–2.03) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Highest qualification | * No qualifications | * 1.70 | * (1.07–2.68) | * 1.44 | * (0.97–2.15) | * 1.81 | * (1.31–2.51) | * 1.72 | * (1.22–2.42) |
| * School qualifications | * 1.25 | * (0.72–2.19) | * 1.58 | * (1.05–2.38) | * 1.23 | * (0.86–1.78) | * 1.40 | * (1.02–1.94) |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * **Model 5: Ethnicity and labour-force status** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.25 | * (0.65–2.39) | * 0.86 | * (0.47–1.56) | * 0.71 | * (0.43–1.18) | * 1.27 | * (0.84–1.92) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Labour-force status | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Unemployed | * 1.27 | * (0.31–5.13) | * 2.91 | * (1.47–5.78) | * 2.98 | * (2.01–4.42) | * 2.99 | * (1.95–4.58) |
| * Non-labour | * 7.04 | * (4.41–11.24) | * 4.48 | * (3.03–6.62) | * 3.35 | * (2.55–4.42) | * 2.76 | * (2.12–3.60) |
| * **Model 6: All variables** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.11 | * (0.57–2.17) | * 0.84 | * (0.45–1.55) | * 0.57 | * (0.34–0.96) | * 1.13 | * (0.74–1.73) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Marital status | * Never married | * 1.64 | * (0.95–2.85) | * 2.24 | * (1.47–3.40) | * 2.14 | * (1.51–3.03) | * 1.94 | * (1.38–2.72) |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Separated, divorced and widowed | * 2.39 | * (1.32–4.33) | * 1.75 | * (0.99–3.11) | * 1.44 | * (0.89–2.31) | * 2.79 | * (1.83–4.24) |
| * Household income | * Low income | * 1.36 | * (0.80–2.32) | * 1.24 | * (0.77–1.99) | * 1.34 | * (0.88–2.04) | * 1.30 | * (0.88–1.92) |
| * Mid income | * 1.15 | * (0.69–1.90) | * 1.61 | * (1.07–2.44) | * 1.41 | * (0.96–2.07) | * 1.46 | * (1.02–2.10) |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Car access | * Nil cars | * 1.33 | * (0.67–2.61) | * 1.04 | * (0.51–2.10) | * 1.03 | * (0.56–1.91) | * 1.90 | * (1.14–3.17) |
| * 1 car | * 0.85 | * (0.55–1.31) | * 1.17 | * (0.82–1.66) | * 1.14 | * (0.84–1.55) | * 1.38 | * (1.02–1.86) |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Highest qualification | * No qualifications | * 1.54 | * (0.97–2.46) | * 1.22 | * (0.81–1.83) | * 1.29 | * (0.91–1.82) | * 1.29 | * (0.90–1.84) |
| * School qualifications | * 1.19 | * (0.68–2.07) | * 1.46 | * (0.97–2.21) | * 1.13 | * (0.79–1.64) | * 1.27 | * (0.92–1.77) |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Labour-force status | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Unemployed | * 0.90 | * (0.22–3.72) | * 2.34 | * (1.15–4.76) | * 2.31 | * (1.51–3.53) | * 2.37 | * (1.50–3.74) |
| * Non-labour | * 4.91 | * (2.96–8.17) | * 3.49 | * (2.30–5.29) | * 2.42 | * (1.78–3.28) | * 2.14 | * (1.61–2.85) |
| * Tenure | * Owned free and mortgaged | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Private tenancy | * 0.62 | * (0.37–1.04) | * 0.76 | * (0.48–1.19) | * 0.46 | * (0.30–0.72) | * 0.66 | * (0.47–0.93) |
| * Public tenancy | * 0.63 | * (0.28–1.42) | * 0.63 | * (0.36–1.10) | * 1.60 | * (1.14–2.26) | * 0.39 | * (0.22–0.67) |

Note: All models also control for age by five-year age group.

### 45−64-year-old males

#### Ethnicity

The data is too sparse (eg, wide confidence intervals for Māori), and also affected by selection bias, to allow a useful determination of ethnic trends.

#### Household income

The association of low household income with higher suicide rates is considerably reduced at all four points in time following adjustment for all other variables (Model 6). Regarding trends over time, the rate ratios comparing the low- and high-income groups tended to be higher in the 1990s compared to the 1980s in Model 2. In the full multivariable Model 6 there was only a 25 to 30 percent increased rate among the low-income group for the 1981−84, 1986−89 and 1991−94 cohorts, but a near 50 percent excess remained in 1996−99. Of note, the 95 percent confidence intervals for these latter rate ratios all substantially overlapped. Therefore, we do not have convincing evidence that any increasingly strong bivariate association of income with suicide among 45−64-year-old males over time (Model 2, and previous result in this report) was due to increased correlation with other adverse socioeconomic factors over time.

#### Labour-force status

An excess rate of suicide among the unemployed (and non-active labour force) remains during all periods, although the strength of the association is reduced by up to half following multivariable adjustment.

#### Marital status

Being married is protective against suicide after controlling for socioeconomic factors during all periods.

Table 9: Rate ratios (95 percent confidence intervals) from Poisson regression models: 45−64-year-old males

| * **Variable** | * **Value** | * **1981–84** | | * **1986–89** | | * **1991–94** | | * **1996–99** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Model 0: Ethnicity** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.39 | * (0.50–3.88) | * 0.53 | * (0.18–1.62) | * 0.62 | * (0.23–1.63) | * 1.12 | * (0.59–2.13) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * **Model 1: Ethnicity and marital status** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.30 | * (0.46–3.64) | * 0.49 | * (0.16–1.49) | * 0.55 | * (0.21–1.44) | * 1.00 | * (0.53–1.92) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Marital status | * Never married | * 2.58 | * (1.31–5.06) | * 2.77 | * (1.67–4.58) | * 2.46 | * (1.42–4.27) | * 2.78 | * (1.69–4.60) |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Separated, divorced and widowed | * 2.12 | * (1.15–3.90) | * 1.74 | * (1.08–2.81) | * 2.20 | * (1.46–3.33) | * 2.33 | * (1.57- * 3.46) |
| * **Model 2: Ethnicity and household income** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.25 | * (0.44–3.53) | * 0.49 | * (0.16–1.48) | * 0.53 | * (0.20–1.41) | * 1.03 | * (0.54–1.96) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Household income | * Low income | * 1.51 | * (0.89–2.58) | * 1.63 | * (1.08–2.47) | * 2.06 | * (1.32–3.21) | * 2.00 | * (1.26–3.17) |
| * Mid income | * 0.84 | * (0.46–1.54) | * 0.98 | * (0.62–1.55) | * 1.24 | * (0.77–2.00) | * 1.92 | * (1.22–3.03) |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * **Model 3: Ethnicity and car access** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.31 | * (0.47–3.69) | * 0.46 | * (0.15–1.41) | * 0.55 | * (0.21–1.45) | * 1.01 | * (0.53–1.93) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Car access | * Nil cars | * 1.69 | * (0.68–4.17) | * 2.93 | * (1.56–5.50) | * 1.90 | * (0.82–4.39) | * 2.27 | * (1.12–4.61) |
| * 1 car | * 1.78 | * (1.08–2.94) | * 1.39 | * (0.97–2.00) | * 1.89 | * (1.32–2.71) | * 1.78 | * (1.25–2.53) |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * **Model 4: Ethnicity and highest qualification** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.31 | * (0.46–3.69) | * 0.47 | * (0.15–1.43) | * 0.60 | * (0.23–1.59) | * 1.07 | * (0.56–2.05) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Highest qualification | * No qualifications | * 1.18 | * (0.69–2.01) | * 1.62 | * (1.12–2.35) | * 1.23 | * (0.83–1.83) | * 1.31 | * (0.88–1.93) |
| * School qualifications | * 0.69 | * (0.28–1.71) | * 0.88 | * (0.49–1.59) | * 1.63 | * (1.04–2.58) | * 1.35 | * (0.87–2.09) |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * **Model 5: Ethnicity and labour force status** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.31 | * (0.47–3.67) | * 0.50 | * (0.17–1.52) | * 0.48 | * (0.18–1.28) | * 1.00 | * (0.52–1.92) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Labour-force status | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Unemployed | * 2.00 | * (0.53–7.59) | * 2.62 | * (1.04–6.57) | * 3.45 | * (1.88–6.33) | * 2.02 | * (0.98–4.14) |
| * Non-labour | * 2.05 | * (1.20–3.52) | * 1.88 | * (1.22–2.92) | * 2.84 | * (1.96–4.11) | * 1.95 | * (1.36–2.81) |
| * **Model 6: All variables** | |  |  |  |  |  |  |  |  |
| * Ethnicity | * Māori | * 1.17 | * (0.41–3.36) | * 0.42 | * (0.14–1.29) | * 0.42 | * (0.16–1.14) | * 0.91 | * (0.47–1.77) |
| * Non-Māori non-Pākehā | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Marital status | * Never married | * 2.43 | * (1.20–4.91) | * 2.19 | * (1.27–3.79) | * 1.90 | * (1.06–3.41) | * 2.25 | * (1.32–3.83) |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Separated, divorced and widowed | * 2.10 | * (1.11–3.96) | * 1.61 | * (0.97–2.66) | * 1.82 | * (1.17–2.82) | * 2.12 | * (1.40–3.22) |
| * Household income | * Low income | * 1.25 | * (0.70–2.24) | * 1.29 | * (0.82–2.02) | * 1.24 | * (0.74–2.06) | * 1.46 | * (0.88–2.43) |
| * Mid income | * 0.77 | * (0.42–1.43) | * 0.92 | * (0.58–1.46) | * 1.12 | * (0.69–1.81) | * 1.74 | * (1.09–2.76) |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Car access | * Nil cars | * 1.17 | * (0.44–3.06) | * 1.87 | * (0.91–3.84) | * 0.78 | * (0.31–1.95) | * 1.32 | * (0.60–2.90) |
| * 1 car | * 1.59 | * (0.95–2.66) | * 1.19 | * (0.81–1.75) | * 1.38 | * (0.94–2.03) | * 1.35 | * (0.93–1.97) |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Highest qualification | * No qualifications | * 1.07 | * (0.62–1.84) | * 1.47 | * (1.00–2.15) | * 1.04 | * (0.69–1.56) | * 1.11 | * (0.74–1.65) |
| * School qualifications | * 0.64 | * (0.26–1.60) | * 0.80 | * (0.44–1.45) | * 1.51 | * (0.96–2.39) | * 1.23 | * (0.79–1.91) |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Labour-force status | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Unemployed | * 1.40 | * (0.36–5.48) | * 1.78 | * (0.69–4.60) | * 2.66 | * (1.38–5.10) | * 1.51 | * (0.71–3.21) |
| * Non-labour | * 1.53 | * (0.87–2.71) | * 1.37 | * (0.87–2.16) | * 2.16 | * (1.43–3.24) | * 1.51 | * (1.01–2.24) |
| * Tenure | * Owned free and mortgaged | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |
| * Private tenancy | * 0.70 | * (0.35–1.39) | * 0.76 | * (0.38–1.49) | * 0.65 | * (0.31–1.39) | * 0.68 | * (0.37–1.26) |
| * Public tenancy | * 0.83 | * (0.25–2.72) | * 0.47 | * (0.21–1.06) | * 1.68 | * (0.96–2.94) | * 0.70 | * (0.32–1.55) |

Note: All models also control for age by five-year age group.

# Discussion and Conclusion

It is unusual internationally to be able to conduct analyses such as those presented in this report. Cohort studies of the entire population of a country, repeated four times over a period of marked social change, are rare. Such record linkage studies will never be perfect because they rely on existing (usually administrative) data. Even though the full population is included, statistical power may diminish for a specific cause of death (eg, suicide), especially when analyses are further stratified by demographic factors. Nevertheless, the NZCMS is a unique opportunity internationally for exploring the possible effects of social factors on suicide.

In terms of levels of evidence, the findings reported here are not based on randomised controlled trials. Clearly such a design would be neither ethical nor feasible for a whole-population study of the social determinants of suicide. However, this study presents the highest level of evidence it is possible to generate with the available data sets. As a cohort study, the evidence produced is superior to that generated by case series or expert consensus opinion.

Although the NZCMS data is a rich data set, there are technical limitations that must be kept in mind when interpreting the analysis. First, the linkage rates for 15−24-year-olds’ deaths and Māori and Pacific deaths were lower than for other deaths in each census cohort (Hill et al 2002). We explicitly addressed this linkage bias by calculating weights that we used in the cohort analyses (Fawcett et al 2002). Therefore we have no reason to believe that any important systematic bias remains to either under- or overestimate social differences in suicide mortality. However, for groups such as 25−44-year-olds where the linkage rates were low, results must be interpreted with caution due to possible instability in the weighted adjustment.

In addition, when trying to interpret the changing social patterning of suicide over time, we must not forget that New Zealand is just one possible population of study. The changing patterns may have been different in another time period or another country with similar macro-economic and social change. In essence, and as with many quantitative sociological investigations such as this, New Zealand constitutes a sample size of n = 1.

## Identifying patterns: from statistical to trend inferences

As with any observational cohort study, the NZCMS is prone to possible error. The most commonly used epidemiological framework of ‘sources of error’ that may occur in any given study is that of Rothman and Greenland (1998). Within this framework, sources of error include:

* random error (or chance)
* systematic error (or bias), namely:

selection bias

confounding

information bias.

These sources of error need to be considered as one step towards making meaningful interpretations of study findings, and eventually towards causal inference. We will use this framework to emphasise the key issues in this study.

### Random error

Random error is traditionally ruled out by quickly checking that the p value is less than 0.05, or (violating the reasons for presenting confidence intervals instead of p values) checking that the 95 percent confidence interval excludes the null. Such an approach is inadequate (Sterne et al 2001). Firstly, it means that 5 percent of all false hypotheses would be falsely accepted. Also, true hypotheses will be rejected (ie, Type II error) when the p value is greater than 0.05 due to inadequate study power. Moreover, from a Bayesian perspective, this generic rule ignores all our prior knowledge about the association under investigation. What do these considerations mean for this NZCMS-based study of socioeconomic position, marital status and suicide?

We know that suicide rates vary by marital status and socioeconomic factors. Therefore, we are not overly concerned about a 95 percent confidence interval for the relative risk of suicide by a given social factor including 1.0. What we are more interested in (and have little *a priori* knowledge about) is whether the rate ratio (or rate difference or RII) association of suicide with social factors changes over time. To make this interpretation, we first examine the actual estimates of the effect measure (ie, put aside the confidence intervals initially) and determine whether any apparent trend over time is substantial enough to be meaningful. If so, then we consider random error as a possible explanation for the trend by examining the 95 percent confidence intervals over time. (Occasionally, we were also able to make use of statistical tests of trend.)

Considering suicide trends within social groups (rather than trends in the association of social factors with suicide in the above bullet point), we know that there are background secular trends in suicide. Therefore, we are not interested in commenting on these trends *per se*, but rather determining whether the trends *vary* by social group. To do this in this report, we make qualitative use of confidence intervals about the rates. A more formal statistical approach might have been taken, but was beyond the scope of this report.

It is also important to note that the NZCMS cohorts are full population cohorts. Strictly speaking, there is no sampling occurring. Given this, one school of thought is that confidence intervals and p values are irrelevant as we have the results for the entire population of interest. However, we subscribe to the school of thought that for an uncommon event like suicide there is still randomness in the exact number of suicides occurring in each year for a given stratum of society. Put another way, had we been able to go back in time, and let the New Zealand ‘experiment’ happen again, that same random variation might not have occurred. Nevertheless, we do accept the case that the need to examine confidence intervals and p values is less important for a full population study than a small random sample-based study.

### Systematic error

#### Selection bias

Selection bias exists for some of the data. For example, not all census respondents reported income. However, given that we have full population data, and reassuring sensitivity analyses published elsewhere that do not demonstrate substantial selection biases in the NZCMS (Blakely 2002b), we do not consider selection bias to be a threat to the validity of this study.

#### Confounding

Undoubtedly there is considerable confounding of the association of, say, income with suicide. Indeed, this has been demonstrated elsewhere using NZCMS data (Blakely et al 2003). However, the aim of this report is to evaluate trends. For confounding to be a threat to the validity of these comparisons over time would require that the amount of confounding of the association of a given socioeconomic factor or marital status with suicide also varied over time. While this is possible, we do not believe its impact on trends would be substantial. Furthermore, multivariable analyses are problematic because one simultaneously adjusts for both confounding and mediating effects of covariates. The latter mediating effects are actually part of the causal association of marital status of socioeconomic position with suicide. Unfortunately, disentangling confounding and mediating effects of covariates is extremely problematic. For all these reasons, we rely on interpreting trends in just the age- and ethnicity-adjusted associations.

It should be noted that even if confounding is viewed as a possible threat to our *causal* interpretations, it does not alter the fact that marital status or socioeconomic position may be a *marker* of varying suicide trends.

A final form of confounding is health selection bias. Here, for example, poor mental health might lead to a falling level of income (or exclusion from the labour force), which would result in a spurious association with suicide. Again, we do not have strong reasons to believe that such biases are large (other than for being in the non-active labour force, but not for unemployment) or vary over the four NZCMS cohorts.

#### Information bias

Firstly, linkage bias (or, more strictly speaking, misclassification bias of the suicide outcome) may not be fully adjusted for using our weighting method. However, any residual linkage bias would probably not be large or systematic, rendering some results, at worst, unstable rather than systematically biased. Secondly, the marital status and socioeconomic exposures are undoubtedly misclassified to some extent in the NZCMS. Such error will probably underestimate any associations with suicide at a given point in time, but will probably not vary over time.

#### Other considerations in the interpretation of results

Putting aside sources of error, considerations similar to the Bradford−Hill criteria of causal inference (Hill 1965) also warrant examination when interpreting trends over time. Of particular note here is consistency, or, more directly, observing similar patterns in adjacent demographic groups. For example, the fact that income seemed to become a more powerful predictor of suicide risk over time among both males and females and both 25−44 and 45−64-year-olds gives us more confidence in this finding than if it were only apparent in, say, 45−64-year-old females.

However, this consideration (as with all the others) is not absolute. For example, major upheaval in the labour market among 25−44-year-olds over time might give us reason to expect a changing association of unemployment with suicide only in this age group.

Finally, another layer of judgement is called for when we make inferences about whether any changes in the distribution of individual-level social characteristics might be due to changes in the broader social milieu. As described, we know there were important economic and other policy changes in New Zealand over the period in question. This means that if we observe changes in the patterns of suicide by marital status and socioeconomic position, it is a matter of informed judgement as to how much we link these to the more widespread changes in social context.

## Key findings

* *No socioeconomic or marital groups were immune to background trends in suicide rates.* Suicide rates rose and fell in concert across groups over time. Indeed, they appeared to rise and fall to a similar extent in all marital and socioeconomic groups, *except* across income groups, where we found variation (see below).
* *Not being married was always a strong and independent predictor of suicide* – more so for men than for women. In Western countries being married has long been recognised as a protective factor against suicide, with this same gender difference consistently shown (Cantor 2000). One mooted possible explanation for this finding is the protective influence for women of having children. Another is that for men, being married increases benefits in terms of social integration. In contemporary New Zealand society legal marital status is a decreasingly useful proxy for the possible protective characteristics of long-term intimate relationships. Accordingly, we might expect a decrease in the predictive ability of marital status in the future. It is unclear what the impact of civil union status will be in this regard.
* *Lower socioeconomic position was associated with higher suicide rates* within all demographic strata and at all points in time, with the exception of education among females (see below). This is consistent with our previous work on the 1991 cohort (Blakely et al 2003). However, a review of international studies has shown inconsistent findings for this association, possibly partly attributable to the differences in methods employed by various studies (Platt and Hawton 2000).
* Suicide rates for men aged 18−44 years and women aged 18−24 years increased as much among the employed as among the unemployed. Therefore

the hypothesis that labour market changes differentially affect the suicide risk of those people that become unemployed is not supported, and

the association of labour-force status with suicide at the individual level *cannot* be the explanation for changing suicide rates in New Zealand over time. Indeed, despite increasing unemployment rates up to the early 1990s, the vast majority of suicides occurred among the employed and non-active at all points in time.

It may have been that the increased risk of suicide over time among the employed was due to the changing nature of work (Benach et al 1999). During this time the labour market changed substantially, with the expectation of a ‘job for life’ disappearing. At the lower end of the market, in particular, there was increasing casualisation of jobs, and it became common for people in low-skilled occupations to have to work more than one job to gain sufficient income to live. In the corporate labour market there were multiple restructurings and redundancies, which particularly affected those in their 30s, 40s and 50s. For those with jobs of any kind there was a new expectation to work harder, more efficiently, and for longer hours. Such changes in the nature of work and the labour market environment have been shown to have a damaging effect on mental health (Ferrie et al 2001; Winefield 2002; Ferrie et al 2003; Vezina et al 2004). Of note, these effects are patterned by gender and by social class (Matthews et al 2001; Artazcoz et al 2004.

* As stated above, *there was evidence that over time, suicide trends varied by income.* Among 25−44 and 45−64-year-olds the association of low income with suicide risk increased over time. Among men, a higher risk among low-income people in the early 1980s simply became greater by the late 1990s. Among women, a lower risk associated with low income disappeared with the emergence of increased risk by the late 1990s.
* The increasing relative association of suicide with low income over time is given some support by the finding that the association with car access (a proxy for asset wealth) also increased over time among 25–44-year-old men. For this group, there was an 84 percent increase in suicide rates over the period of observation for those with no access to a car, compared to a 40 percent increase for those with access to two or more cars. Findings were not as consistent for other sex-by-age groups. However, as few people have no access to a car, the statistical precision of the car access results is poor.
* The increasing association between low income and suicide over time may explain some of the trend to rapidly increasing rates of suicide among Māori youth (particularly males). This hypothesis is supported by the reduction in the rate ratio of suicide for 25−44-year-old Māori men compared to non-Māori non-Pacific men, from 1.51 (1.00−2.26; adjusted for age only) to 1.13 (0.74−1.73) in multivariable analyses that included a range of socioeconomic factors and marital status. (Multivariable analyses for women were not possible due to sparse data.)
* As described above, the association of income with suicide among 25−64-year-old men (age and ethnicity adjusted only) *increased* over time. However, this increasing trend was largely removed in the multivariable analyses that controlled for marital status and socioeconomic factors. One reason for this might be that multiple risk factors for suicide (eg, unemployment, not being married) became increasingly concentrated with low income over time. Put another way, the concentration of multiple social disadvantages may have increased over time. Further work on this hypothesis, while outside the scope of this report, seems justified.
* An unexpected finding was that *suicide rates were higher among more educated women aged 45−64 and 65−77 than among less educated women*, at all points in time. We do not know the explanation for this association. Possibilities include higher rates of depression among more educated women and varying choice of suicide method by education. Regarding the latter, the increase in suicide rates among young women in New Zealand is associated with changes in choice of method (Beautrais 2000), with hanging and motor vehicle exhaust becoming more common. It is possible that this change might have also been patterned by education level, but this has not been explored.
* *Our findings do not inform us about the pathways by which marital status and socioeconomic position influence suicide risk.* For example, we are unable to determine the proportion of the association of socioeconomic position with suicide that is due to either or both of confounding and mediation by mental illness.

## Conclusions

This study is part of a multi-faceted enquiry, contracted by the Ministry of Health, into the possible links between social factors and suicide in New Zealand. Its findings sit alongside what is already known about important risk factors for suicide, such as mental illness, and what has been generated from the other components of the overall enquiry. We have demonstrated in this study that suicide rates are patterned by socioeconomic factors, and that this patterning is complex.

The two important underlying assumptions of the enquiry as a whole are that:

* suicide rates are a reflection of the prevalence of mental illness in the community (Skegg 1997)
* the social and economic characteristics of any society influence the health (including mental health) of the people in that society (Marmot 1999; Berkman and Kawachi 2000).

Although we have not demonstrated the mechanisms for any associations, in the context of these assumptions our findings are consistent with the existence of causal pathways between social conditions and death by suicide. It is worth noting that no social groups were immune to background suicide trends – although we did find evidence of greater susceptibility among low-income people. The challenge is to better understand the patterns we have observed, the nature of the links, and how this might inform interventions to reduce suicide rates.

# Appendices

Table 10: Standardised rate ratios of suicide, by ethnicity

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Ethnicity** | * **1981−84** | * **1986−89** | * **1991−94** | * **1996−99** | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |
| * 15−24 | * Māori | * 0.47 (0.20−1.10) | * 1.24 (0.78−1.97) | * 1.71 (1.18−2.48) | * 1.98 (1.39−2.83) | * 0.032 |
| * Pacific | * 1.60 (0.50−5.12) | * 1.04 (0.41−2.60) | * 1.05 (0.46−2.38) | * 1.25 (0.67−2.33) | * 0.757 |
| * Non-Māori non-Pākehā | * 1.00− | * 1.00− | * 1.00− | * 1.00− |  |
| * 25−44 | * Māori | * 1.09 (0.64−1.88) | * 0.80 (0.47−1.34) | * 1.14 (0.79−1.66) | * 1.75 (1.29−2.39) | * 0.175 |
| * Pacific | * 0.76 (0.27−2.12) | * 0.85 (0.39−1.82) | * 0.66 (0.31−1.43) | * 1.00 (0.54−1.85) | * 0.453 |
| * Non-Māori non-Pākehā | * 1.00− | * 1.00− | * 1.00− | * 1.00− |  |
| * 45−64 | * Māori | * 0.68 (0.27−1.69) | * 0.44 (0.16−1.18) | * 0.41 (0.17−1.02) | * 1.12 (0.65−1.90) | * 0.308 |
| * Pacific | * 0.00− | * 0.64(0.20−2.02) | * 0.80 (0.24−2.64) | * 0.64 (0.19−2.10) | * 0.986 |
| * Non-Māori non-Pākehā | * 1.00− | * 1.00− | * 1.00− | * 1.00− |  |
| * 25−64 | * Māori | * 0.93 (0.58−1.48) | * 0.65 (0.41−1.04) | * 0.90 (0.64−1.26) | * 1.57 (1.20−2.05) | * 0.203 |
| * Pacific | * 0.46 (0.17−1.27) | * 0.77(0.40−1.45) | * 0.71 (0.37−1.37) | * 0.90 (0.52−1.55) | * 0.157 |
| * Non-Māori non-Pākehā | * 1.00− | * 1.00− | * 1.00− | * 1.00− |  |
| * **Females** |  |  |  |  |  |  |
| * 15−24 | * Māori | * 1.38 (0.30−6.34) | * 1.22 (0.49−3.01) | * 1.18 (0.44−3.21) | * 1.58 (0.84−2.97) | * 0.283 |
| * Pacific | * 2.58 (0.56−11.77) | * 0.00− | * 0.46 (0.06−3.41) | * 0.27 (0.04−2.00) | * 0.142 |
| * Non-Māori non-Pākehā | * 1.00− | * 1.00− | * 1.00− | * 1.00− |  |
| * 25−44 | * Māori | * 0.69 (0.25−1.92) | * 0.74 (0.35−1.57) | * 0.71 (0.27−1.87) | * 1.85 (1.1−2.99) | * 0.106 |
| * Pacific | * 0.00− | * 0.59 (0.14−2.42) | * 0.37 (0.05−2.69) | * 1.37 (0.59−3.18) | * 0.314 |
| * Non-Māori non-Pākehā | * 1.00− | * 1.00− | * 1.00− | * 1.00− |  |
| * 45−64 | * Māori | * 0.22 (0.03−1.61) | * 0.00− | * 0.18 (0.03−1.31) | * 0.87 (0.31−2.47) | * 0.375 |
| * Pacific | * 0.00− | * 0.93 (0.23−3.80) | * 0.21 (0.03−1.51) | * 0.53 (0.07−3.85) | * 0.526 |
| * Non-Māori non-Pākehā | * 1.00− | * 1.00− | * 1.00− | * 1.00− |  |
| * 25−64 | * Māori | * 0.46 (0.19−1.13) | * 0.41 (0.20−0.85) | * 0.47 (0.20−1.10) | * 1.55 (1.01−2.38) | * 0.110 |
| * Pacific | * 0.00− | * 0.74 (0.27−2.02) | * 0.30 (0.07−1.30) | * 1.11 (0.51−2.41) | * 0.552 |
| * Non-Māori non-Pākehā | * 1.00− | * 1.00− | * 1.00− | * 1.00− |  |

Note: Age-standardised (five-year age groups) using the 1991 census as the standard population.

Table 11: Standardised rate differences of suicide, by ethnicity

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Ethnicity** | * **1981−84** | * **1986−89** | * **1991−94** | * **1996−99** | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |
| * 15−24 | * Māori | * -11.1 (-20.9− -1.3) | * 8.5 (-10.9−27.8) | * 28.8 (5.5−52.2) | * 40.5 (14.3−66.7) | * 0.004 |
| * Pacific | * 12.7 (-26.0−51.5) | * 1.3 (-31.9−34.5) | * 1.9 (-32.8−36.6) | * 10.4 (-21.3−42.1) | * 0.991 |
| * Non-Māori non-Pākehā | * 0.0− | * 0.0− | * 0.0− | * 0.0− |  |
| * 25−44 | * Māori | * 2.0 (-10.3−14.2) | * -5.8 (-17.8−6.2) | * 4.6 (-8.8−18.1) | * 25.4 (8.3−42.5) | * 0.302 |
| * Pacific | * -4.9 (-21.3−11.4) | * -4.3 (-22.8−14.2) | * -10.9 (-27.5−5.7) | * 0.1 (-20.6−20.8) | * 0.914 |
| * Non-Māori non-Pākehā | * 0.0− | * 0.0− | * 0.0− | * 0.0− |  |
| * 45−64 | * Māori | * -7.1 (-21.0−6.9) | * -17.1 (-30.9− -3.2) | * -15.3 (-25.7− -5.0) | * 2.6 (-10.5−15.6) | * 0.599 |
| * Pacific | * -22.1 (-26.1− -18.0) | * -10.9 (-33.6−11.8) | * -5.1 (-30.1−19.9) | * -8.0 (-25.1−9.0) | * 0.683 |
| * Non-Māori non-Pākehā | * 0.0− | * 0.0− | * 0.0− | * 0.0− |  |
| * 25−64 | * Māori | * -1.5 (-10.7−7.7) | * -10.1 (-19.2− -1.0) | * -3.0 (-12.2−6.2) | * 16.7 (5.0−28.4) | * 0.388 |
| * Pacific | * -11.5 (-21.7− -1.3) | * -6.8 (-21.2−7.5) | * -8.7 (-22.7−5.3) | * -3.0 (-17.4−11.3) | * 0.112 |
| * Non-Māori non-Pākehā | * 0.0− | * 0.0− | * 0.0− | * 0.0− |  |
| * **Females** |  |  |  |  |  |  |
| * 15−24 | * Māori | * 1.6 (-6.7−9.8) | * 1.8 (-6.9−10.4) | * 1.4 (-7.6−10.4) | * 7.8 (-4.5−20.1) | * 0.338 |
| * Pacific | * 6.4 (-8.4−21.2) | * -8.1 (-11.7− -4.6) | * -4.2 (-11.9−3.5) | * -9.8 (-18.2− -1.3) | * 0.682 |
| * Non-Māori non-Pākehā | * 0.0− | * 0.0− | * 0.0− | * 0.0− | * . |
| * 25−44 | * Māori | * -2.5 (-8.2−3.3) | * -2.2 (-7.2−2.8) | * -2.1 (-7.3−3.1) | * 7.1 (0.3−13.9) | * 0.261 |
| * Pacific | * -7.8 (-10.1− -5.5) | * -3.5(-10.9−3.8) | * -4.6 (-10.3− -1.1) | * 3.1 (-6.4−12.6) | * 0.544 |
| * Non-Māori non-Pākehā | * 0.0− | * 0.0− | * 0.0− | * 0.0− |  |
| * 45−64 | * Māori | * -9.9 (-16.2− -3.6) | * -11.5 (-14.2− -8.9) | * -8.7 (-13.2− -4.1) | * -0.8 (-6.4−4.8) | * 0.169 |
| * Pacific | * -12.8 (-15.7− -9.8) | * -0.8 (-16.0−14.3) | * -8.4 (-13.4− -3.3) | * -2.9 (-9.5−3.7) | * 0.715 |
| * Non-Māori non-Pākehā | * 0.0− | * 0.0− | * 0.0− | * 0.0− |  |
| * 25−64 | * Māori | * -5.2 (-9.5− -0.9) | * -5.7 (-9.0− -2.4) | * -4.6 (-8.3− -0.9) | * 4.1 (-0.6−8.9) | * 0.237 |
| * Pacific | * -9.7 (-11.5− -7.8) | * -2.5 (-9.8−4.8) | * -6.0 (-10.1− -2.0) | * 0.8 (-5.6−7.3) | * 0.697 |
| * Non-Māori non-Pākehā | * 0.0− | * 0.0− | * 0.0− | * 0.0− |  |

Note: Age-standardised (five-year age groups) using the 1991 census as the standard population.

Table 12: Standardised rate ratios of suicide, by marital status

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Marital status** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * Males |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * Never married | * 2.02 | * (1.30–3.14) | * 2.60 | * (1.86–3.64) | * 2.07 | * (1.53–2.79) | * 2.01 | * (1.48–2.73) | * 0.563 |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Separated, divorced and widowed | * 1.88 | * (1.09–3.22) | * 1.75 | * (1.05–2.92) | * 1.71 | * (1.07–2.73) | * 2.22 | * (1.41–3.50) | * 0.418 |
| * 45−64 | * Never married | * 2.25 | * (1.29–3.93) | * 2.78 | * (1.82–4.23) | * 2.39 | * (1.49–3.83) | * 2.23 | * (1.41–3.55) | * 0.631 |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Separated, divorced and widowed | * 2.24 | * (1.40–3.58) | * 1.60 | * (1.05–2.43) | * 2.10 | * (1.45–3.04) | * 1.97 | * (1.37–2.83) | * 0.944 |
| * 65−77 | * Never married | * 2.18 | * (1.04–4.55) | * 2.16 | * (1.04–4.49) | * 2.48 | * (1.21–5.07) | * 2.98 | * (1.51–5.88) | * 0.077 |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Separated, divorced and widowed | * 2.54 | * (1.52–4.24) | * 2.28 | * (1.37–3.80) | * 1.21 | * (0.63–2.30) | * 1.90 | * (1.10–3.27) | * 0.300 |
| * 25−64 | * Never married | * 2.11 | * (1.49–2.98) | * 2.68 | * (2.05–3.49) | * 2.18 | * (1.68–2.83) | * 2.08 | * (1.60–2.69) | * 0.566 |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Separated, divorced and widowed | * 2.01 | * (1.39–2.92) | * 1.68 | * (1.19–2.39) | * 1.85 | * (1.34–2.55) | * 2.14 | * (1.52–3.01) | * 0.601 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * Never married | * 2.63 | * (1.03–6.71) | * 3.51 | * (1.96–6.28) | * 1.52 | * (0.79–2.94) | * 1.64 | * (0.97–2.76) | * 0.247 |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Separated, divorced and widowed | * 1.97 | * (0.93–4.15) | * 1.61 | * (0.79–3.29) | * 1.34 | * (0.69–2.62) | * 3.33 | * (1.82–6.09) | * 0.387 |
| * 45−64 | * Never married | * 1.50 | * (0.48–4.71) | * 2.39 | * (1.01–5.67) | * 1.91 | * (0.76–4.83) | * 1.36 | * (0.41–4.49) | * 0.727 |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Separated, divorced and widowed | * 1.77 | * (1.03–3.03) | * 2.14 | * (1.30–3.52) | * 1.37 | * (0.79–2.38) | * 2.27 | * (1.25–4.13) | * 0.833 |
| * 65−77 | * Never married | * 1.62 | * (0.45–5.79) | * 1.54 | * (0.42–5.61) | * 1.41 | * (0.31–6.42) | * 3.11 | * (0.67–14.49) | * 0.307 |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Separated, divorced and widowed | * 1.83 | * (0.85–3.91) | * 1.73 | * (0.78–3.81) | * 0.97 | * (0.40–2.32) | * 1.75 | * (0.70–4.36) | * 0.616 |
| * 25−64 | * Never married | * 2.05 | * (1.00–4.20) | * 2.97 | * (1.83–4.81) | * 1.70 | * (0.96–3.03) | * 1.56 | * (0.96–2.54) | * 0.333 |
| * Currently married | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Separated, divorced and widowed | * 1.86 | * (1.17–2.96) | * 1.87 | * (1.22–2.85) | * 1.36 | * (0.87–2.11) | * 3.03 | * (1.87–4.92) | * 0.496 |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 13: Standardised rate differences of suicide, by marital status

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Marital status** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * Never married | * 18.1 | * (3.9–32.4) | * 32.0 | * (18.1–45.8) | * 24.6 | * (13.6–35.6) | * 26.3 | * (14.9–37.6) | * 0.643 |
| * Currently married | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Separated, divorced and widowed | * 15.6 | * (-1.3–32.4) | * 14.9 | * (-1.8–31.7) | * 16.4 | * (-0.7–33.5) | * 31.8 | * (8.7–54.8) | * 0.273 |
| * 45−64 | * Never married | * 22.0 | * (1.3–42.7) | * 42.7 | * (16.9–68.4) | * 27.7 | * (6.9–48.5) | * 22.9 | * (5.1–40.7) | * 0.835 |
| * Currently married | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Separated, divorced and widowed | * 21.8 | * (5.0–38.6) | * 14.3 | * (-0.9–29.5) | * 21.9 | * (8.2–35.7) | * 18.0 | * (6.3–29.7) | * 0.889 |
| * 65−77 | * Never married | * 33.9 | * (-9.4–77.2) | * 33.5 | * (-9.6–76.6) | * 37.0 | * (-4.2–78.3) | * 42.4 | * (2.7–82.2) | * 0.084 |
| * Currently married | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Separated, divorced and widowed | * 44.2 | * (12.0–76.3) | * 37.1 | * (7.8–66.4) | * 5.2 | * (-13.6–24.0) | * 19.2 | * (-0.5–39.0) | * 0.359 |
| * 25−64 | * Never married | * 19.6 | * (7.8–31.5) | * 36.1 | * (23.0–49.1) | * 25.8 | * (15.3–36.2) | * 25.0 | * (15.2–34.7) | * 0.887 |
| * Currently married | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Separated, divorced and widowed | * 18.0 | * (5.7–30.2) | * 14.7 | * (2.8–26.6) | * 18.5 | * (6.7–30.3) | * 26.5 | * (11.6–41.4) | * 0.305 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * Never married | * 9.4 | * (-3.9–22.7) | * 13.8 | * (4.6–23.1) | * 3.1 | * (-2.3–8.6) | * 4.5 | * (-0.5–9.6) | * 0.361 |
| * Currently married | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Separated, divorced and widowed | * 5.6 | * (-2.1–13.3) | * 3.4 | * (-2.5–9.3) | * 2.1 | * (-2.9–7.1) | * 16.5 | * (4.9–28.2) | * 0.772 |
| * 45−64 | * Never married | * 5.1 | * (-12.1–22.3) | * 11.9 | * (-4.9–28.8) | * 7.7 | * (-6.7–22.1) | * 1.7 | * (-5.7–9.0) | * 0.297 |
| * Currently married | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Separated, divorced and widowed | * 7.8 | * (-1.0–16.6) | * 9.8 | * (1.9–17.6) | * 3.1 | * (-2.8–9.1) | * 5.9 | * (0.7–11.0) | * 0.519 |
| * 65−77 | * Never married | * 4.8 | * (-10.3–20.0) | * 4.8 | * (-11.5–21.0) | * 3.2 | * (-13.0–19.4) | * 9.0 | * (-9.7–27.7) | * 0.506 |
| * Currently married | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Separated, divorced and widowed | * 6.4 | * (-2.2–15.1) | * 6.4 | * (-2.9–15.6) | * -0.3 | * (-7.0–6.5) | * 3.2 | * (-2.3–8.7) | * 0.457 |
| * 25−64 | * Never married | * 7.8 | * (-2.8–18.3) | * 13.1 | * (4.6–21.7) | * 4.8 | * (-1.5–11.2) | * 3.5 | * (-0.7–7.7) | * 0.217 |
| * Currently married | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Separated, divorced and widowed | * 6.4 | * (0.6–12.3) | * 5.8 | * (1.1–10.5) | * 2.5 | * (-1.4–6.3) | * 12.5 | * (5.0–20.1) | * 0.924 |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 14: Standardised rate ratios of suicide, by household income

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Household income** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Low income | * 1.66 | * (0.82–3.38) | * 0.92 | * (0.57–1.48) | * 1.11 | * (0.67–1.83) | * 1.00 | * – | * 0.624 |
| * Mid income | * 1.35 | * (0.63–2.88) | * 1.02 | * (0.64–1.62) | * 1.47 | * (0.91–2.37) | * 1.05 | * (0.66–1.68) | * 0.870 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−44 | * Low income | * 1.21 | * (0.74–1.98) | * 1.23 | * (0.83–1.84) | * 1.90 | * (1.31–2.76) | * 1.66 | * (1.20–2.29) | * 0.278 |
| * Mid income | * 1.17 | * (0.71–1.91) | * 1.24 | * (0.84–1.84) | * 1.47 | * (1.00–2.18) | * 1.26 | * (0.90–1.77) | * 0.645 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 45−64 | * Low income | * 1.36 | * (0.81–2.29) | * 1.57 | * (1.05–2.34) | * 1.96 | * (1.22–3.14) | * 2.18 | * (1.37–3.47) | * 0.009 |
| * Mid income | * 0.87 | * (0.49–1.55) | * 1.06 | * (0.69–1.63) | * 1.09 | * (0.66–1.81) | * 1.87 | * (1.16–3.00) | * 0.109 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 65−77 | * Low income | * 1.34 | * (0.74–2.44) | * 1.60 | * (0.94–2.71) | * 0.71 | * (0.37–1.38) | * 1.57 | * (0.89–2.76) | * 0.975 |
| * Mid income | * 0.89 | * (0.48–1.63) | * 0.83 | * (0.44–1.60) | * 0.75 | * (0.40–1.39) | * 0.91 | * (0.48–1.71) | * 0.944 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−64 | * Low income | * 1.26 | * (0.88–1.82) | * 1.36 | * (1.02–1.82) | * 1.92 | * (1.43–2.58) | * 1.77 | * (1.36–2.32) | * 0.176 |
| * Mid income | * 1.06 | * (0.72–1.55) | * 1.17 | * (0.87–1.57) | * 1.34 | * (0.98–1.84) | * 1.40 | * (1.06–1.84) | * 0.016 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Low income | * 1.64 | * (0.35–7.65) | * 0.87 | * (0.30–2.52) | * 0.76 | * (0.27–2.14) | * 0.68 | * (0.28–1.66) | * 0.171 |
| * Mid income | * 1.16 | * (0.21–6.44) | * 0.96 | * (0.34–2.72) | * 1.10 | * (0.42–2.87) | * 1.12 | * (0.50–2.49) | * 0.552 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−44 | * Low income | * 0.60 | * (0.28–1.30) | * 1.36 | * (0.67–2.75) | * 1.64 | * (0.83–3.23) | * 1.77 | * (1.05–2.98) | * 0.067 |
| * Mid income | * 0.59 | * (0.27–1.28) | * 1.47 | * (0.73–2.96) | * 1.35 | * (0.69–2.63) | * 0.66 | * (0.34–1.29) | * 0.928 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 45−64 | * Low income | * 0.76 | * (0.42–1.38) | * 1.94 | * (0.95–3.94) | * 1.49 | * (0.76–2.90) | * 2.15 | * (1.00–4.62) | * 0.196 |
| * Mid income | * 0.57 | * (0.30–1.08) | * 1.75 | * (0.86–3.58) | * 0.89 | * (0.43–1.82) | * 1.29 | * (0.57–2.93) | * 0.620 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 65−77 | * Low income | * 1.18 | * (0.46–3.00) | * 0.50 | * (0.19–1.34) | * 1.04 | * (0.38–2.83) | * 1.34 | * (0.48–3.73) | * 0.682 |
| * Mid income | * 0.90 | * (0.33–2.42) | * 0.40 | * (0.13–1.24) | * 0.82 | * (0.26–2.59) | * 1.20 | * (0.40–3.57) | * 0.517 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−64 | * Low income | * 0.68 | * (0.43–1.10) | * 1.56 | * (0.93–2.60) | * 1.56 | * (0.97–2.52) | * 1.84 | * (1.18–2.87) | * 0.097 |
| * Mid income | * 0.58 | * (0.35–0.96) | * 1.57 | * (0.94–2.62) | * 1.12 | * (0.68–1.83) | * 0.79 | * (0.46–1.34) | * 0.908 |
| * High income | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 15: Standardised rate differences of suicide, by household income

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Household income** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Low income | * 9.4 | * (-4.0–22.8) | * -3.3 | * (-21.0–14.4) | * 4.1 | * (-15.6–23.7) | * 0.0 | * – | * 0.615 |
| * Mid income | * 5.0 | * (-7.8–17.8) | * 0.6 | * (-17.5–18.7) | * 17.7 | * (-4.0–39.3) | * 2.7 | * (-21.3–26.6) | * 0.752 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−44 | * Low income | * 4.0 | * (-6.3–14.2) | * 5.3 | * (-4.8–15.4) | * 20.8 | * (9.2–32.4) | * 19.0 | * (6.9–31.1) | * 0.115 |
| * Mid income | * 3.2 | * (-7.0–13.3) | * 5.5 | * (-4.4–15.5) | * 10.9 | * (0.2–21.7) | * 7.6 | * (-3.4–18.6) | * 0.248 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 45−64 | * Low income | * 6.5 | * (-4.2–17.2) | * 13.4 | * (1.4–25.4) | * 18.3 | * (6.3–30.4) | * 15.8 | * (6.7–24.8) | * 0.162 |
| * Mid income | * -2.3 | * (-11.7–7.2) | * 1.5 | * (-9.0–12.0) | * 1.7 | * (-8.3–11.8) | * 11.6 | * (3.1–20.1) | * 0.075 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 65−77 | * Low income | * 13.2 | * (-13.7–40.1) | * 20.2 | * (-2.3–42.7) | * -9.2 | * (-27.4–8.9) | * 14.2 | * (-3.3–31.8) | * 0.845 |
| * Mid income | * -4.4 | * (-26.9–18.1) | * -5.6 | * (-25.6–14.4) | * -8.1 | * (-25.8–9.5) | * -2.3 | * (-17.5–12.9) | * 0.634 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−64 | * Low income | * 4.9 | * (-2.6–12.5) | * 8.4 | * (0.6–16.1) | * 19.9 | * (11.4–28.4) | * 17.8 | * (9.5–26.0) | * 0.095 |
| * Mid income | * 1.1 | * (-6.1–8.3) | * 4.0 | * (-3.3–11.3) | * 7.4 | * (-0.3–15.1) | * 9.1 | * (1.6–16.7) | * 0.007 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Low income | * 2.4 | * (-5.0–9.7) | * -1.1 | * (-9.9–7.6) | * -1.8 | * (-8.8–5.1) | * -4.6 | * (-15.6–6.3) | * 0.030 |
| * Mid income | * 0.6 | * (-6.2–7.4) | * -0.3 | * (-9.3–8.6) | * 0.7 | * (-7.0–8.5) | * 1.7 | * (-10.5–13.9) | * 0.509 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−44 | * Low income | * -3.7 | * (-9.4–1.9) | * 2.6 | * (-3.2–8.3) | * 3.5 | * (-1.5–8.5) | * 6.8 | * (0.8–12.8) | * 0.048 |
| * Mid income | * -3.8 | * (-9.5–1.8) | * 3.3 | * (-2.7–9.3) | * 1.9 | * (-2.4–6.1) | * -3.0 | * (-7.8–1.9) | * 0.995 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 45−64 | * Low income | * -3.8 | * (-12.2–4.6) | * 6.0 | * (-0.3–12.2) | * 4.4 | * (-2.9–11.6) | * 4.3 | * (-0.2–8.7) | * 0.484 |
| * Mid income | * -6.9 | * (-14.8–1.0) | * 4.8 | * (-1.1–10.7) | * -1.0 | * (-7.1–5.1) | * 1.1 | * (-2.4–4.6) | * 0.678 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 65−77 | * Low income | * 1.9 | * (-8.9–12.7) | * -8.1 | * (-20.1–3.9) | * 0.4 | * (-8.4–9.1) | * 2.1 | * (-5.1–9.3) | * 0.650 |
| * Mid income | * -1.1 | * (-11.0–8.8) | * -9.7 | * (-21.7–2.2) | * -1.6 | * (-10.6–7.5) | * 1.2 | * (-6.2–8.6) | * 0.504 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−64 | * Low income | * -3.8 | * (-8.5–1.0) | * 3.8 | * (-0.5–8.1) | * 3.8 | * (-0.3–7.9) | * 5.9 | * (1.7–10.0) | * 0.128 |
| * Mid income | * -5.0 | * (-9.6–-0.4) | * 3.9 | * (-0.5–8.2) | * 0.8 | * (-2.7–4.3) | * -1.5 | * (-4.8–1.8) | * 0.871 |
| * High income | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 16: Standardised rate ratios of suicide, by household car access

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Car access** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Nil cars | * 1.07 | * (0.34–3.31) | * 0.97 | * (0.46–2.06) | * 1.08 | * (0.60–1.96) | * 1.69 | * (0.97–2.95) | * 0.167 |
| * 1 car | * 1.56 | * (0.87–2.78) | * 1.03 | * (0.70–1.54) | * 1.08 | * (0.74–1.58) | * 1.25 | * (0.87–1.80) | * 0.814 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−44 | * Nil cars | * 1.59 | * (0.87–2.90) | * 1.58 | * (0.87–2.87) | * 1.61 | * (0.96–2.71) | * 2.61 | * (1.78–3.84) | * 0.164 |
| * 1 car | * 0.81 | * (0.55–1.20) | * 1.22 | * (0.90–1.65) | * 1.23 | * (0.94–1.61) | * 1.26 | * (0.97–1.63) | * 0.230 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 45−64 | * Nil cars | * 1.66 | * (0.75–3.67) | * 2.82 | * (1.60–4.98) | * 1.97 | * (0.97–4.00) | * 1.93 | * (1.03–3.61) | * 0.797 |
| * 1 car | * 1.75 | * (1.12–2.73) | * 1.28 | * (0.91–1.80) | * 1.63 | * (1.17–2.28) | * 1.45 | * (1.05–2.00) | * 0.808 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 65−77 | * Nil cars | * 0.96 | * (0.39–2.36) | * 1.56 | * (0.71–3.43) | * 1.59 | * (0.68–3.76) | * 1.85 | * (0.68–5.05) | * 0.094 |
| * 1 car | * 0.89 | * (0.50–1.58) | * 1.03 | * (0.61–1.75) | * 1.11 | * (0.65–1.90) | * 2.36 | * (1.37–4.09) | * 0.152 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−64 | * Nil cars | * 1.61 | * (0.99–2.61) | * 2.05 | * (1.35–3.09) | * 1.72 | * (1.13–2.62) | * 2.42 | * (1.74–3.36) | * 0.226 |
| * 1 car | * 1.08 | * (0.80–1.46) | * 1.24 | * (0.99–1.56) | * 1.35 | * (1.09–1.67) | * 1.31 | * (1.07–1.61) | * 0.184 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Nil cars | * 3.65 | * (0.81–16.38) | * 2.27 | * (0.63–8.19) | * 1.21 | * (0.27–5.44) | * 3.47 | * (1.37–8.78) | * 0.868 |
| * 1 car | * 1.63 | * (0.42–6.34) | * 1.12 | * (0.44–2.90) | * 1.61 | * (0.75–3.45) | * 2.30 | * (1.21–4.37) | * 0.177 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−44 | * Nil cars | * 2.92 | * (1.08–7.94) | * 1.65 | * (0.66–4.12) | * 2.79 | * (1.17–6.66) | * 1.35 | * (0.61–3.00) | * 0.414 |
| * 1 car | * 1.33 | * (0.67–2.67) | * 0.83 | * (0.49–1.41) | * 1.25 | * (0.71–2.20) | * 1.39 | * (0.89–2.16) | * 0.486 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 45−64 | * Nil cars | * 2.22 | * (1.00–4.94) | * 3.28 | * (1.58–6.82) | * 3.96 | * (1.80–8.75) | * 5.91 | * (2.75–12.71) | * 0.023 |
| * 1 car | * 1.36 | * (0.78–2.38) | * 1.23 | * (0.73–2.07) | * 1.55 | * (0.90–2.65) | * 1.79 | * (0.95–3.37) | * 0.171 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 65−77 | * Nil cars | * 1.36 | * (0.37–5.07) | * 1.60 | * (0.40–6.36) | * 1.04 | * (0.28–3.79) | * 5.26 | * (1.38–20.06) | * 0.280 |
| * 1 car | * 1.35 | * (0.43–4.22) | * 1.01 | * (0.28–3.68) | * 1.12 | * (0.42–3.00) | * 1.67 | * (0.46–5.99) | * 0.635 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−64 | * Nil cars | * 2.57 | * (1.33–4.97) | * 2.25 | * (1.26–4.03) | * 3.29 | * (1.83–5.93) | * 2.42 | * (1.40–4.19) | * 0.868 |
| * 1 car | * 1.35 | * (0.86–2.11) | * 0.98 | * (0.67–1.43) | * 1.37 | * (0.93–2.04) | * 1.48 | * (1.02–2.14) | * 0.462 |
| * ≥ 2 cars | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 17: Standardised rate differences of suicide, by household car access

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Car access** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Nil cars | * 1.2 | * (-19.7–22.0) | * -1.1 | * (-27.4–25.3) | * 3.7 | * (-24.1–31.5) | * 31.3 | * (-9.0–71.7) | * 0.290 |
| * 1 car | * 9.7 | * (-3.1–22.5) | * 1.2 | * (-13.3–15.7) | * 3.5 | * (-13.7–20.8) | * 11.4 | * (-7.6–30.4) | * 0.973 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−44 | * Nil cars | * 13.5 | * (-6.4–33.4) | * 13.8 | * (-7.8–35.4) | * 17.2 | * (-5.1–39.5) | * 51.6 | * (22.3–80.8) | * 0.232 |
| * 1 car | * -4.2 | * (-12.6–4.1) | * 5.3 | * (-2.7–13.3) | * 6.3 | * (-2.1–14.8) | * 8.4 | * (-1.2–17.9) | * 0.112 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 45−64 | * Nil cars | * 9.6 | * (-8.2–27.5) | * 42.2 | * (7.9–76.4) | * 19.0 | * (-7.1–45.1) | * 18.2 | * (-4.7–41.2) | * 0.674 |
| * 1 car | * 10.9 | * (2.6–19.3) | * 6.5 | * (-2.6–15.6) | * 12.3 | * (3.5–21.1) | * 8.9 | * (0.7–17.0) | * 0.941 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 65−77 | * Nil cars | * -1.7 | * (-37.1–33.8) | * 20.3 | * (-20.4–61.1) | * 15.2 | * (-17.1–47.4) | * 13.6 | * (-13.7–40.9) | * 0.408 |
| * 1 car | * -4.5 | * (-27.0–18.0) | * 1.3 | * (-18.1–20.6) | * 2.8 | * (-11.5–17.1) | * 21.8 | * (9.2–34.5) | * 0.097 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−64 | * Nil cars | * 12.0 | * (-2.1–26.1) | * 24.6 | * (6.0–43.3) | * 17.9 | * (0.8–34.9) | * 38.8 | * (18.7–58.9) | * 0.173 |
| * 1 car | * 1.6 | * (-4.5–7.6) | * 5.7 | * (-0.3–11.8) | * 8.6 | * (2.4–14.8) | * 8.6 | * (1.9–15.2) | * 0.066 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 15−24 | * Nil cars | * 7.9 | * (-3.4–19.2) | * 8.9 | * (-9.3–27.0) | * 1.4 | * (-10.2–12.9) | * 22.4 | * (-3.0–47.7) | * 0.997 |
| * 1 car | * 1.9 | * (-3.1–6.9) | * 0.9 | * (-6.2–7.9) | * 4.0 | * (-2.6–10.5) | * 11.7 | * (1.8–21.6) | * 0.214 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−44 | * Nil cars | * 10.1 | * (-2.8–22.9) | * 5.5 | * (-6.6–17.5) | * 10.1 | * (-2.2–22.4) | * 2.8 | * (-5.3–10.9) | * 0.272 |
| * 1 car | * 1.7 | * (-2.3–5.8) | * -1.4 | * (-5.5–2.7) | * 1.4 | * (-2.2–5.0) | * 3.0 | * (-1.2–7.2) | * 0.544 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 45−64 | * Nil cars | * 10.5 | * (-2.7–23.8) | * 18.8 | * (1.5–36.0) | * 20.5 | * (1.5–39.6) | * 19.6 | * (4.4–34.9) | * 0.150 |
| * 1 car | * 3.1 | * (-2.4–8.6) | * 1.9 | * (-2.9–6.7) | * 3.8 | * (-1.0–8.6) | * 3.1 | * (-0.7–6.9) | * 0.655 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 65−77 | * Nil cars | * 3.0 | * (-9.5–15.5) | * 5.7 | * (-9.9–21.3) | * 0.3 | * (-9.9–10.5) | * 13.9 | * (1.1–26.7) | * 0.488 |
| * 1 car | * 2.8 | * (-7.2–12.9) | * 0.1 | * (-12.3–12.4) | * 1.0 | * (-6.9–8.9) | * 2.2 | * (-2.7–7.1) | * 0.876 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−64 | * Nil cars | * 10.2 | * (0.8–19.7) | * 10.5 | * (0.5–20.4) | * 14.0 | * (3.5–24.5) | * 9.1 | * (1.4–16.7) | * 0.839 |
| * 1 car | * 2.3 | * (-1.0–5.5) | * -0.2 | * (-3.3–3.0) | * 2.3 | * (-0.6–5.2) | * 3.1 | * (0.1–6.0) | * 0.519 |
| * ≥ 2 cars | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 18: Standardised rate ratios of suicide, by highest qualification

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Highest qualification** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * No qualifications | * 1.89 | * (1.23–2.90) | * 1.59 | * (1.14–2.23) | * 1.58 | * (1.18–2.11) | * 1.53 | * (1.14–2.04) | * 0.171 |
| * School qualifications | * 1.18 | * (0.68–2.03) | * 1.54 | * (1.07–2.22) | * 1.11 | * (0.80–1.54) | * 1.27 | * (0.95–1.70) | * 0.724 |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 45−64 | * No qualifications | * 1.14 | * (0.70–1.86) | * 1.76 | * (1.26–2.47) | * 1.13 | * (0.79–1.61) | * 1.29 | * (0.91–1.83) | * 0.733 |
| * School qualifications | * 0.79 | * (0.37–1.68) | * 1.08 | * (0.65–1.80) | * 1.51 | * (1.00–2.28) | * 1.30 | * (0.87–1.94) | * 0.331 |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 65−77 | * No qualifications | * 1.05 | * (0.54–2.01) | * 1.40 | * (0.78–2.49) | * 1.73 | * (0.96–3.10) | * 1.37 | * (0.82–2.29) | * 0.488 |
| * School qualifications | * 0.73 | * (0.27–1.97) | * 2.05 | * (1.07–3.92) | * 0.91 | * (0.44–1.87) | * 1.14 | * (0.60–2.14) | * 0.752 |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−64 | * No qualifications | * 1.56 | * (1.12–2.16) | * 1.66 | * (1.30–2.11) | * 1.43 | * (1.13–1.81) | * 1.46 | * (1.16–1.85) | * 0.317 |
| * School qualifications | * 1.00 | * (0.65–1.56) | * 1.37 | * (1.02–1.83) | * 1.24 | * (0.96–1.60) | * 1.28 | * (1.01–1.62) | * 0.650 |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * No qualifications | * 1.74 | * (0.80–3.77) | * 0.73 | * (0.37–1.41) | * 1.03 | * (0.56–1.89) | * 1.61 | * (0.94–2.75) | * 0.803 |
| * School qualifications | * 1.85 | * (0.77–4.48) | * 1.09 | * (0.60–2.00) | * 0.98 | * (0.53–1.80) | * 1.53 | * (0.95–2.48) | * 0.943 |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 45−64 | * No qualifications | * 0.77 | * (0.41–1.44) | * 0.52 | * (0.30–0.90) | * 0.72 | * (0.40–1.30) | * 0.87 | * (0.46–1.64) | * 0.559 |
| * School qualifications | * 0.60 | * (0.21–1.69) | * 0.91 | * (0.47–1.74) | * 1.41 | * (0.77–2.58) | * 0.80 | * (0.38–1.65) | * 0.725 |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 65−77 | * No qualifications | * 0.51 | * (0.15–1.71) | * 0.47 | * (0.18–1.21) | * 0.30 | * (0.11–0.88) | * 0.69 | * (0.23–2.07) | * 0.698 |
| * School qualifications | * 0.61 | * (0.12–3.01) | * 0.26 | * (0.07–1.02) | * 0.63 | * (0.23–1.70) | * 0.99 | * (0.30–3.31) | * 0.279 |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * 25−64 | * No qualifications | * 1.14 | * (0.69–1.87) | * 0.63 | * (0.40–0.98) | * 0.89 | * (0.57–1.37) | * 1.35 | * (0.88–2.07) | * 0.557 |
| * School qualifications | * 1.07 | * (0.56–2.04) | * 1.00 | * – | * 1.18 | * (0.77–1.80) | * 1.27 | * (0.86–1.89) | * 0.100 |
| * Post-school qualifications | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 19: Standardised rate differences of suicide, by highest qualification

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Highest qualification** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * No qualifications | * 13.4 | * (4.8–22.1) | * 12.6 | * (3.0–22.2) | * 16.0 | * (5.1–26.9) | * 16.8 | * (4.7–28.9) | * 0.160 |
| * School qualifications | * 2.7 | * (-6.4–11.8) | * 11.6 | * (1.3–22.0) | * 2.9 | * (-6.8–12.7) | * 8.7 | * (-1.8–19.2) | * 0.690 |
| * Post-school qualifications | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 45−64 | * No qualifications | * 2.8 | * (-7.0–12.7) | * 16.3 | * (6.4–26.1) | * 2.8 | * (-5.3–10.9) | * 5.7 | * (-2.2–13.7) | * 0.865 |
| * School qualifications | * -4.1 | * (-16.8–8.6) | * 1.7 | * (-9.9–13.3) | * 11.0 | * (-0.9–22.9) | * 6.0 | * (-3.5–15.5) | * 0.238 |
| * Post-school qualifications | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 65−77 | * No qualifications | * 1.8 | * (-23.7–27.3) | * 10.2 | * (-6.9–27.4) | * 16.3 | * (-0.7–33.3) | * 8.5 | * (-5.3–22.2) | * 0.725 |
| * School qualifications | * -10.6 | * (-42.7–21.5) | * 26.9 | * (0.2–53.6) | * -2.0 | * (-17.3–13.3) | * 3.2 | * (-12.7–19.0) | * 0.936 |
| * Post-school qualifications | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25-64 | * No qualifications | * 9.4 | * (2.8–15.9) | * 14.0 | * (7.0–21.0) | * 10.9 | * (3.5–18.4) | * 12.6 | * (4.5–20.7) | * 0.554 |
| * School qualifications | * 0.1 | * (-7.4–7.5) | * 7.8 | * (0.0–15.6) | * 6.0 | * (-1.5–13.6) | * 7.7 | * (0.2–15.1) | * 0.238 |
| * Post-school qualifications | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 25−44 | * No qualifications | * 3.5 | * (-1.0–8.0) | * -2.5 | * (-7.8–2.7) | * 0.2 | * (-4.1–4.5) | * 4.6 | * (-0.9–10.1) | * 0.915 |
| * School qualifications | * 4.0 | * (-2.0–10.0) | * 0.9 | * (-5.0–6.7) | * -0.2 | * (-4.3–4.0) | * 4.0 | * (-0.5–8.5) | * 0.949 |
| * Post-school qualifications | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 45−64 | * No qualifications | * -3.0 | * (-10.8–4.9) | * -6.9 | * (-13.4–-0.4) | * -2.8 | * (-7.8–2.3) | * -0.9 | * (-4.9–3.1) | * 0.277 |
| * School qualifications | * -5.3 | * (-15.4–4.7) | * -1.3 | * (-10.2–7.5) | * 4.0 | * (-3.2–11.2) | * -1.4 | * (-5.7–2.9) | * 0.763 |
| * Post-school qualifications | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 65−77 | * No qualifications | * -9.7 | * (-32.3–12.9) | * -10.9 | * (-27.8–5.9) | * -10.5 | * (-22.4–1.4) | * -2.5 | * (-10.8–5.7) | * 0.174 |
| * School qualifications | * -7.7 | * (-33.7–18.4) | * -15.3 | * (-32.4–1.8) | * -5.6 | * (-18.5–7.4) | * 0.0 | * (-9.8–9.7) | * 0.145 |
| * Post-school qualifications | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * 25−64 | * No qualifications | * 1.1 | * (-3.0–5.1) | * -4.2 | * (-8.3–-0.1) | * -0.9 | * (-4.2–2.4) | * 2.5 | * (-1.2–6.3) | * 0.642 |
| * School qualifications | * 0.5 | * (-4.8–5.8) | * 0.0 | * – | * 1.4 | * (-2.4–5.2) | * 2.0 | * (-1.3–5.3) | * 0.056 |
| * Post-school qualifications | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 20: Standardised rate ratios of suicide, by labour-force status

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Labour-force status** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 18−24 | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Unemployed | * 4.25 | * (2.10–8.60) | * 0.87 | * (0.47–1.63) | * 1.65 | * (1.04–2.61) | * 1.04 | * (0.62–1.75) | * 0.298 |
| * Non-labour | * 1.61 | * (0.63–4.10) | * 1.09 | * (0.69–1.74) | * 0.97 | * (0.63–1.48) | * 0.97 | * (0.65–1.43) | * 0.245 |
| * 25−44 | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Unemployed | * 2.47 | * (1.15–5.31) | * 3.04 | * (1.80–5.14) | * 2.57 | * (1.78–3.70) | * 2.54 | * (1.76–3.67) | * 0.558 |
| * Non-labour | * 5.03 | * (2.91–8.70) | * 3.13 | * (2.04–4.78) | * 3.03 | * (2.24–4.10) | * 2.23 | * (1.66–3.01) | * 0.076 |
| * 45−64 | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Unemployed | * 1.90 | * (0.62–5.85) | * 2.97 | * (1.37–6.42) | * 3.09 | * (1.77–5.40) | * 1.95 | * (0.98–3.89) | * 0.785 |
| * Non-labour | * 2.82 | * (1.50–5.30) | * 2.37 | * (1.44–3.89) | * 2.93 | * (1.98–4.34) | * 2.12 | * (1.46–3.08) | * 0.488 |
| * 25−64 | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Unemployed | * 2.25 | * (1.20–4.23) | * 3.01 | * (1.94–4.68) | * 2.74 | * (2.01–3.73) | * 2.38 | * (1.72–3.29) | * 0.636 |
| * Non-labour | * 4.18 | * (2.71–6.46) | * 2.82 | * (2.04–3.92) | * 3.00 | * (2.36–3.81) | * 2.20 | * (1.73–2.80) | * 0.117 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 18−24 | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Unemployed | * 1.14 | * (0.12–10.41) | * 1.28 | * (0.35–4.63) | * 0.74 | * (0.21–2.62) | * 1.00 | * – | * 0.424 |
| * Non-labour | * 2.28 | * (0.62–8.43) | * 0.92 | * (0.27–3.08) | * 0.97 | * (0.42–2.21) | * 1.37 | * (0.67–2.80) | * 0.521 |
| * 25−44 | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Unemployed | * 2.06 | * (0.28–15.18) | * 3.18 | * (1.49–6.79) | * 2.15 | * (0.92–5.03) | * 1.98 | * (0.95–4.09) | * 0.252 |
| * Non-labour | * 1.19 | * (0.67–2.11) | * 1.03 | * (0.61–1.74) | * 1.86 | * (1.09–3.20) | * 1.90 | * (1.24–2.90) | * 0.133 |
| * 45−64 | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Unemployed | * 0.00 | * – | * 0.61 | * (0.08–4.50) | * 0.94 | * (0.13–7.00) | * 1.97 | * (0.46–8.38) | * 0.159 |
| * Non-labour | * 1.44 | * (0.88–2.35) | * 1.47 | * (0.89–2.46) | * 2.82 | * (1.63–4.88) | * 3.01 | * (1.68–5.41) | * 0.080 |
| * 25−64 | * Employed | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – | * 1.00 | * – |  |
| * Unemployed | * 1.14 | * (0.16–8.22) | * 2.08 | * (1.04–4.16) | * 1.67 | * (0.76–3.68) | * 1.97 | * (1.02–3.80) | * 0.863 |
| * Non-labour | * 1.30 | * (0.89–1.90) | * 1.22 | * (0.85–1.75) | * 2.24 | * (1.53–3.28) | * 2.18 | * (1.54–3.07) | * 0.137 |

Note: Age- and ethnicity-standardised (five-year age groups and Māori, Pacific and non-Māori non-Pacific ethnic groups) using the 1991 census as the standard population.

Table 21: Standardised rate differences of suicide, by labour-force status

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Age (year)** | * **Labour-force status** | * **1981−84** | | * **1986−89** | | * **1991−94** | | * **1996−99** | | * **P (trend)** |
| * **Males** |  |  |  |  |  |  |  |  |  |  |
| * 18−24 | * Employed | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Unemployed | * 69.3 | * (13.1–125.5) | * -5.9 | * (-31.4–19.7) | * 34.8 | * (-0.4–70.0) | * 2.6 | * (-30.6–35.7) | * 0.788 |
| * Non-labour | * 12.9 | * (-17.8–43.6) | * 4.2 | * (-18.5–27.0) | * -1.8 | * (-24.4–20.8) | * -1.9 | * (-25.6–21.7) | * 0.086 |
| * 25−44 | * Employed | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Unemployed | * 26.8 | * (-6.8–60.4) | * 48.3 | * (12.0–84.7) | * 37.5 | * (16.9–58.1) | * 48.8 | * (21.0–76.5) | * 0.309 |
| * Non-labour | * 73.5 | * (26.0–120.9) | * 50.3 | * (20.7–79.9) | * 48.6 | * (29.5–67.6) | * 39.1 | * (19.8–58.3) | * 0.079 |
| * 45−64 | * Employed | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Unemployed | * 16.6 | * (-22.3–55.5) | * 50.1 | * (-6.8–106.9) | * 39.9 | * (9.4–70.3) | * 18.6 | * (-7.0–44.2) | * 0.872 |
| * Non-labour | * 33.6 | * (2.5–64.7) | * 34.8 | * (6.6–63.1) | * 36.8 | * (18.1–55.5) | * 21.9 | * (8.0–35.8) | * 0.257 |
| * 25−64 | * Employed | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Unemployed | * 22.9 | * (-2.6–48.4) | * 49.0 | * (17.7–80.3) | * 38.4 | * (21.2–55.7) | * 37.2 | * (17.5–57.0) | * 0.532 |
| * Non-labour | * 58.2 | * (26.6–89.9) | * 44.4 | * (23.2–65.7) | * 44.0 | * (30.3–57.8) | * 32.5 | * (19.5–45.5) | * 0.062 |
| * **Females** |  |  |  |  |  |  |  |  |  |  |
| * 18−24 | * Employed | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Unemployed | * 0.6 | * (-9.9–11.1) | * 2.2 | * (-10.3–14.7) | * -2.9 | * (-13.9–8.1) | * 0.0 | * – | * 0.506 |
| * Non-labour | * 5.5 | * (-3.5–14.5) | * -0.6 | * (-9.6–8.3) | * -0.4 | * (-9.2–8.5) | * 5.1 | * (-6.8–17.0) | * 0.605 |
| * 25−44 | * Employed | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Unemployed | * 6.9 | * (-19.4–33.2) | * 16.1 | * (-0.1–32.3) | * 6.4 | * (-2.9–15.7) | * 7.1 | * (-2.8–16.9) | * 0.504 |
| * Non-labour | * 1.2 | * (-2.9–5.3) | * 0.2 | * (-3.8–4.1) | * 4.8 | * (0.3–9.3) | * 6.5 | * (1.6–11.4) | * 0.131 |
| * 45−64 | * Employed | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Unemployed | * -8.8 | * (-12.0–-5.6) | * -3.6 | * (-15.3–8.1) | * -0.4 | * (-11.8–11.0) | * 4.0 | * (-7.3–15.3) | * 0.058 |
| * Non-labour | * 3.9 | * (-1.4–9.1) | * 4.4 | * (-1.3–10.2) | * 11.0 | * (4.9–17.0) | * 8.2 | * (3.0–13.5) | * 0.234 |
| * 25−64 | * Employed | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – | * 0.0 | * – |  |
| * Unemployed | * 1.0 | * (-15.5–17.5) | * 8.7 | * (-2.3–19.7) | * 3.8 | * (-3.4–11.1) | * 5.9 | * (-1.6–13.4) | * 0.842 |
| * Non-labour | * 2.2 | * (-1.0–5.4) | * 1.8 | * (-1.5–5.0) | * 7.1 | * (3.5–10.7) | * 7.1 | * (3.5–10.8) | * 0.127 |

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