

# **Mortality and Demographic Data**

**2012**

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# Introduction

*Mortality and Demographic Data 2012* presents data on the underlying cause of each death registered in New Zealand in the 2012 calendar year. The causes of death were coded to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification, Sixth Edition (ICD-10-AM). In this publication, the abbreviation ICD is used to refer to the ICD-10-AM coding system (National Centre for Classification in Health 2008).

Underlying cause of death, as defined by the World Health Organization (WHO), is ‘(a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury’ (WHO 1979).

The three main sources of information for mortality data are:

- certificates of cause of death from doctors and coroners
- post-mortem reports
- death registration forms, which are usually completed by a funeral director.

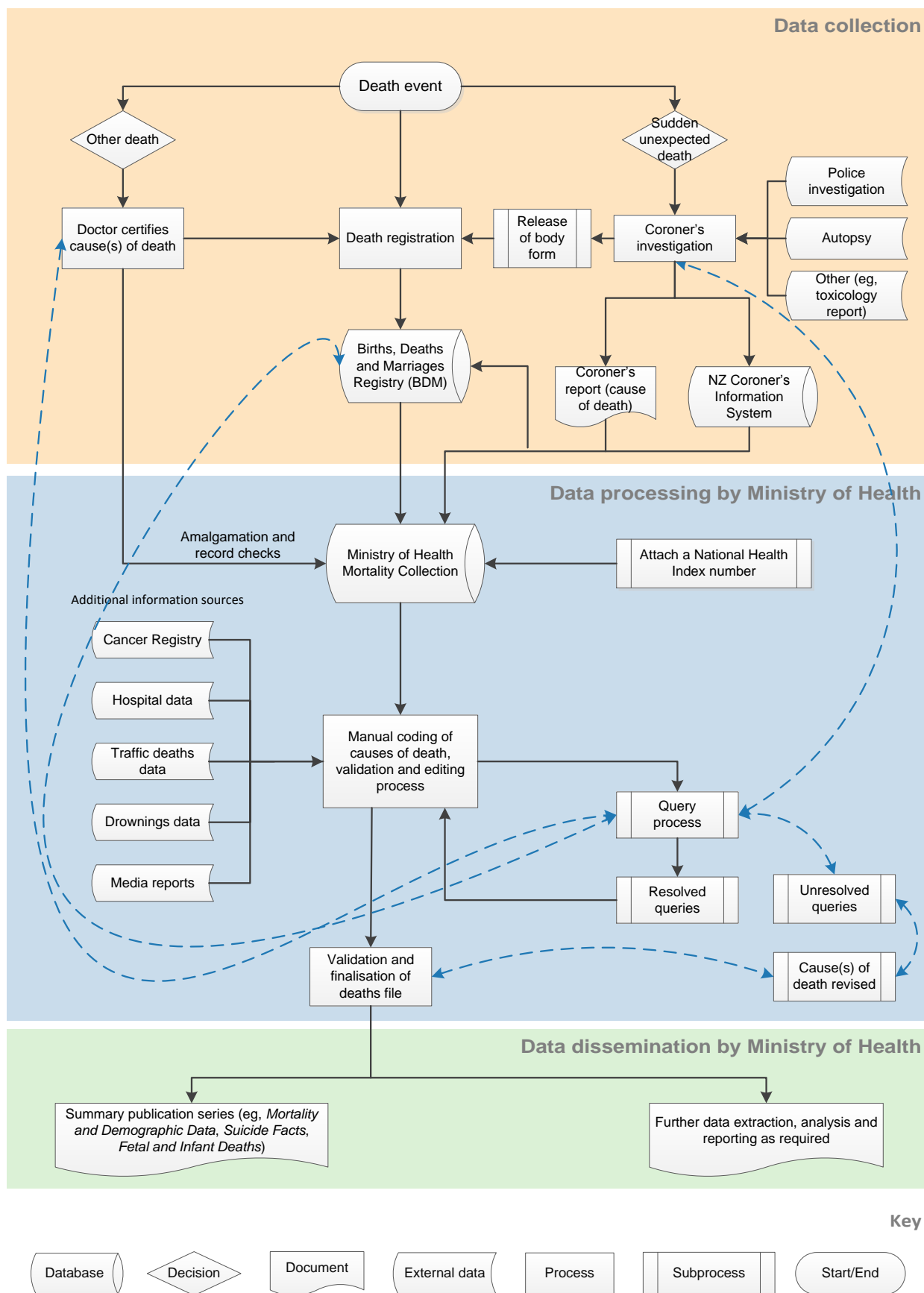
Figure 1 illustrates the stages of processing cause of death data in New Zealand.

## Late data

At the time of publication of this document, the Ministry of Health was unable to assign specific ICD codes to a small number of deaths due to the extended length of time that some coronial inquiries take. These deaths are included in the statistics under the ICD codes R99 (‘other ill-defined and unspecified causes of mortality’) and X59 (‘exposure to unspecified factor’). Because the Ministry of Health Mortality Collection is a dynamic database, the Ministry will update the records for these deaths with specific underlying cause of death codes once it receives coroners’ findings. This means there may be small differences between later extracts of mortality data and data contained in this publication.

The data for this publication was extracted on 11 March 2015. At that time, the deaths of one infant (aged under one year) and six adults were provisionally coded to underlying causes R99 and X59, and the deaths of six infants, four children (aged 1–14 years), 12 youths (aged 15–24 years) and 102 adults (aged 25 years and over) were provisionally coded to other causes. Coronial inquiries had not been completed for these deaths.

**Figure 1: Stages of processing cause of death data in New Zealand**



# Ethnicity data and analysis

Two ethnic groupings are used in the *Mortality and Demographic Data* publication: Māori and non-Māori. The Māori population includes everyone who was identified as Māori, and the non-Māori population includes everyone else.

Because of changes in the Births, Deaths, Marriages and Relationships Registration Act 1995 that came into force in September 1995, Māori and non-Māori rates from 1996 onwards are not comparable with earlier data. For this reason, the ethnicity trend data in this publication covers a smaller range (ie, 1996 to 2012) than that of the total population data (see 'Ethnicity' within this document's 'Explanatory notes' for a discussion of ethnicity coding).

## Statistical notes

In this publication, numbers are generally presented to one decimal place. However, calculations are made from the full string (ie, all the numbers after the decimal place), thereby providing more precise reporting.

### Age-specific and age-standardised rates

This publication uses age-specific and age-standardised rates.

Age-specific mortality rates represent the number of deaths in relation to the population size of a particular age group. The number of deaths within an age group is divided by the population of that age group and then multiplied by 100,000.

Age-standardised rates account for differences in population structure, and can be used to compare groups with different age structures (eg, males and females, or Māori and non-Māori) and data from different years. In the present publication, the population structure used is the WHO World Standard Population, and age-standardised rates are per 100,000 population (see 'Statistical notes' within 'Explanatory notes').

### Confidence intervals

Where appropriate, confidence intervals have been calculated at the 95% or 99% level to aid the interpretation of mortality incidence (Keyfitz 1966). A confidence interval is a range of values used to illustrate the uncertainty around a single value (such as an age-standardised rate). Confidence intervals are calculated with a stated probability; for example 95% (which would indicate that there is a 95% chance that the true value lies within the confidence interval).

Note that Māori populations have lower numbers relative to the total population. This can result in greater variance (and thus larger confidence intervals) when calculating age-standardised rates. Any precise calculations made in the present publication (such as percentage differences between ethnic mortality rates) must be interpreted with this caveat in mind.

## Further mortality data

Statistical mortality data tables are available online in Excel format alongside this *Mortality and Demographic Data 2012* publication at: [www.health.govt.nz/publication/mortality-2012-online-tables](http://www.health.govt.nz/publication/mortality-2012-online-tables). The tables published on this page contain mortality data for the complete range of ICD-10-AM classifications, in sex and five-year age groupings. The data is grouped at national, regional and ethnic group (Māori, Pacific, Asian and non-Māori) level.

Other Ministry of Health publications contain further mortality-related data. These include publications on fetal and infant deaths, suicide, and cancer incidence and mortality.

More detailed information on numbers and rates of live births and on fetal, neonatal and post-neonatal deaths is published in the annual publication series *Fetal and Infant Deaths* ([www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/fetal-and-infant-deaths-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/fetal-and-infant-deaths-series)).

Information on hospitalisations and mortality from suicide can be found in *Suicide Facts: Deaths and intentional self-harm hospitalisations* ([www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/suicide-facts-deaths-and-intentional-self-harm-hospitalisations-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/suicide-facts-deaths-and-intentional-self-harm-hospitalisations-series)).

Information on cancer registrations and mortality can be found in *Cancer: New Registrations and Deaths* ([www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/cancer-new-registrations-and-deaths-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/cancer-new-registrations-and-deaths-series)).

For a complete listing of other mortality-related data, see 'Further mortality-related information'.

# Mortality 2012: Quick facts

## Number of deaths

	2012 mortality		
	Male	Female	Total
Māori	1643	1421	3064
Non-Māori	13,505	13,708	27,213
Total	15,148	15,129	30,277

## Age-standardised rates

	2012 mortality rates		
	Male	Female	Total
Māori	743.3	567.6	649.3
Non-Māori	425.1	305.9	362.0
Total	463.0	332.7	393.6

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

## Selected causes of mortality 2012

Condition	Total deaths	Percentage of deaths by sex		Māori rate		Non-Māori rate		Total rate	
		Male	Female	Male	Female	Male	Female	Male	Female
All cancer	8905	53.2	46.8	209.5	192.5	135.9	101.1	143.4	109.0
Lung cancer‡	1628	54.7	45.3	65.4	66.4	23.9	15.7	27.1	19.7
Female breast cancer	617	...	100.0	...	26.5	...	16.9	...	17.7
Prostate cancer	607	100.0	...	18.1	...	16.4	...	17.0	...
Melanoma of the skin	354	62.7	37.3	0.9	0.8	7.2	3.8	6.8	3.6
Cervical cancer	56	...	100.0	...	3.7	...	1.6	...	1.8
Ischaemic heart disease	5339	55.3	44.7	140.3	77.2	78.5	40.0	85.2	43.8
Cerebrovascular disease	2612	37.1	62.9	30.3	31.7	25.7	28.4	27.1	29.6
Diabetes mellitus	807	53.3	46.7	48.3	33.8	9.9	6.6	12.8	8.6
Suicide	550	73.5	26.5	25.3	10.5	16.3	5.2	18.5	6.4
Motor vehicle accidents	347	73.5	26.5	22.4	6.3	9.3	3.2	11.3	3.7

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

‡ Includes cancer of the trachea, bronchus and lung.

... = Not applicable.

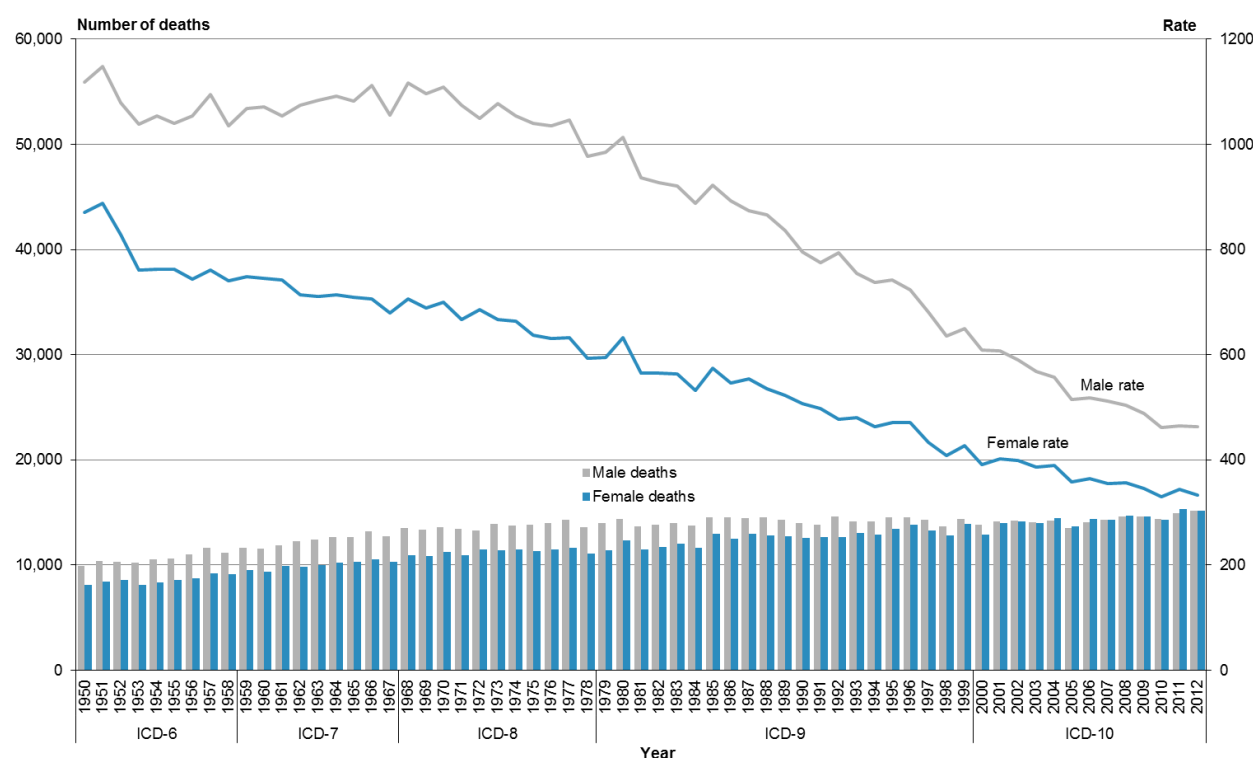
# Mortality in New Zealand

This section presents an overview of national mortality statistics in 2012, describes trends in mortality over time and examines selected major causes of mortality in 2012.

## Overview of mortality statistics

There were 30,277 deaths registered in New Zealand in 2012. The number of deaths generally increased over time (Figure 2). This trend is not surprising bearing in mind that the total population of New Zealand increased at the same time. A more useful measure of mortality is the age-standardised mortality rate, allowing comparisons to be made over time and between differing groups.<sup>1</sup> From 1950 to 2012, the mortality rate showed a strong downward trend when adjusted for age. In 2012 there were 393.6 deaths per 100,000 population.

**Figure 2: Number of deaths and mortality rates, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

In 2012, there were equivalent numbers of male and female deaths (15,148 male deaths and 15,129 female deaths). However, the age-standardised rates showed a different trend; the male rate was 1.4 times higher than the female rate (463.0 deaths per 100,000 males compared to 332.7 per 100,000 females). This disparity is due to the differing age distributions of male and female deaths. Male mortality occurred more frequently in the younger age groups compared to female mortality (see definition of age-standardised rates in ‘Statistical notes’).

<sup>1</sup> For information on age-standardised rates see ‘Statistical notes’.

Māori accounted for one in every ten deaths in 2012 (1643 males and 1421 females). The mortality rate for Māori was 1.8 times the non-Māori rate (649.3 and 362.0 deaths per 100,000 population respectively). Across all age and ethnic groups, males had higher mortality rates than females in 2012 (Table 1).

**Table 1: Mortality rates, by age group, sex and ethnicity, 2012**

	Age-specific rate by age group (years)							Age-standardised rate
	<1	1–14	15–24	25–44	45–64	65–74	75+	
<b>Māori population</b>								
Male	640.3	32.3	125.2	214.7	956.2	3132.4	8936.2	743.3
Female	589.0	22.8	64.1	97.7	674.6	2728.0	7376.0	567.6
Total	615.3	27.7	95.2	152.5	807.5	2917.4	8038.3	649.3
<b>Non-Māori population</b>								
Male	478.9	14.3	66.4	90.9	413.0	1685.3	7387.7	425.1
Female	376.8	12.3	28.2	58.8	279.7	1040.6	6842.2	305.9
Total	428.9	13.3	48.0	74.5	344.8	1353.5	7075.2	362.0
<b>Total population</b>								
Male	523.1	18.6	81.5	111.8	466.8	1785.6	7671.7	463.0
Female	434.6	14.8	35.7	65.1	320.5	1162.7	7035.5	332.7
Total	479.8	16.7	58.9	87.4	391.6	1464.7	7306.6	393.6

Notes:

Age-specific rates are per 100,000 population in each age group.

Age-standardised rates are per 100,000 population, age-standardised to WHO World Standard Population.

The mortality rate for both males and females declined steadily between 1980 and 2012; rates halved over this time (Table 2). In 2012, the male mortality rate was 54.3% lower than in 1980, and the female rate was 47.4% lower.

**Table 2: Number of deaths and mortality rates, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	14,338	1013.6	12,350	633.1	26,688	795.1
1981	13,672	935.8	11,475	564.4	25,147	726.2
1982	13,834	927.2	11,713	564.8	25,547	721.4
1983	13,986	920.0	12,021	562.9	26,007	717.2
1984	13,773	888.6	11,610	531.4	25,383	685.5
1985	14,534	922.4	12,950	575.1	27,484	725.7
1986	14,533	892.1	12,519	545.6	27,052	698.1
1987	14,472	873.4	12,958	554.3	27,430	694.5
1988	14,567	865.8	12,840	535.7	27,407	681.7
1989	14,332	836.3	12,712	522.2	27,044	661.3
1990	13,967	795.7	12,557	506.2	26,524	633.9
1991	13,810	775.6	12,680	497.3	26,490	620.3
1992	14,573	793.1	12,679	476.9	27,252	615.9
1993	14,178	755.3	13,031	480.8	27,209	601.1
1994	14,169	738.0	12,924	463.1	27,093	583.1
1995	14,528	742.3	13,428	471.4	27,956	589.6
1996	14,523	723.8	13,856	471.3	28,379	581.8
1997	14,297	680.1	13,315	433.9	27,612	542.9
1998	13,661	635.0	12,796	408.0	26,457	508.5
1999	14,348	649.3	13,876	427.5	28,224	526.0
2000	13,817	609.2	12,906	391.1	26,723	487.6
2001	14,166	606.7	13,968	402.4	28,134	493.0
2002	14,195	590.4	14,164	398.7	28,360	484.0
2003	14,066	568.6	13,995	385.8	28,061	467.7
2004	14,201	556.8	14,435	388.8	28,636	464.3
2005	13,494	514.8	13,647	357.8	27,141	429.9
2006	14,023	518.0	14,366	364.9	28,389	434.9
2007	14,333	511.8	14,268	355.3	28,601	427.2
2008	14,591	503.7	14,721	356.9	29,312	424.8
2009	14,615	488.5	14,589	346.0	29,204	412.1
2010	14,337	461.9	14,304	330.2	28,641	391.6
2011	14,941	464.4	15,348	343.2	30,289	400.4
2012	15,148	463.0	15,129	332.7	30,277	393.6

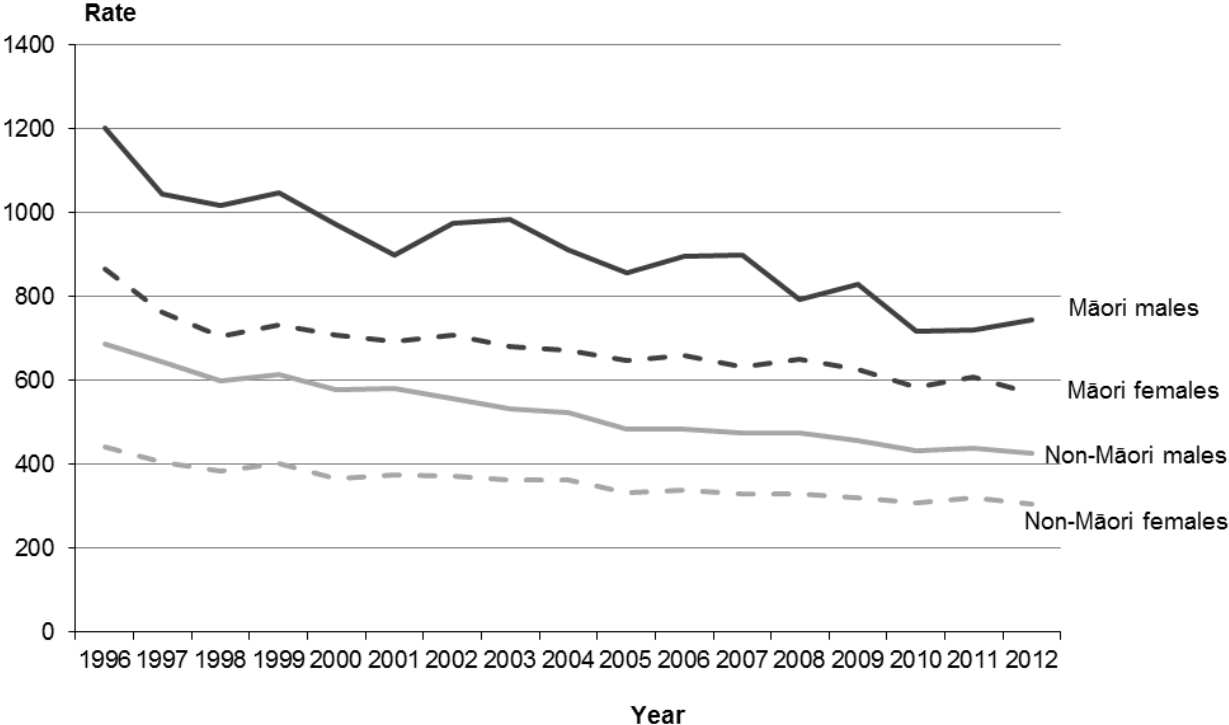
Note: rates per 100,000 population, age-standardised to WHO World Standard Population.



From 1996 to 2012, Māori males consistently had the highest mortality rate (Figure 3). In 2012, the mortality rate for Māori males was 1.7 times the non-Māori male rate. Among females, the rate for Māori was 1.9 times the rate for non-Māori.

Between 1996 and 2012, age-standardised mortality rates for all groups decreased. Males experienced a slightly greater decrease compared to females over this time. From 2011 to 2012, Māori males were the only group to show an increase in their mortality rate.

**Figure 3: Mortality rates, by sex and ethnicity, 1996–2012**



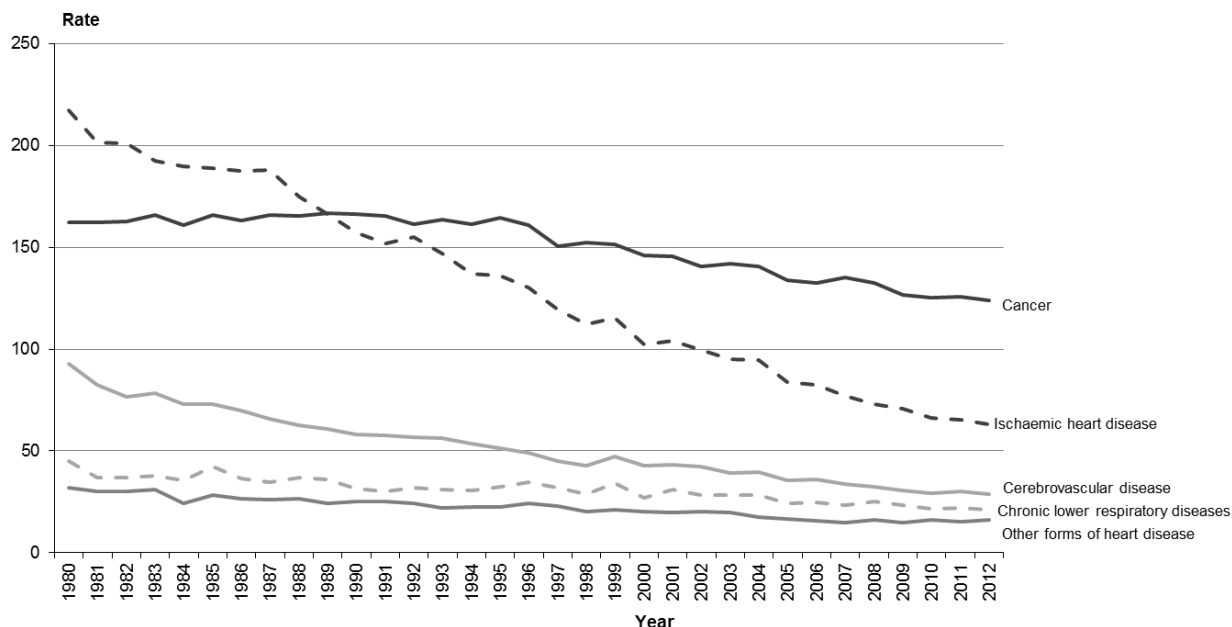
Notes: rates per 100,000 population, age-standardised to WHO World Standard Population.

From 1980 to 2012 the five major causes of death were cancer, ischaemic heart disease, cerebrovascular disease, chronic lower respiratory disease and other forms of heart disease. In 2012, these five major causes accounted for two thirds (65.9%) of all deaths. Cancer accounted for 29.4% of deaths, ischaemic heart disease accounted for 17.6%, and the remaining three together accounted for 18.9% (Figure 4).

Between 1980 and 2012, mortality rates for all five major causes decreased. Specifically:

- ischaemic heart disease and cerebrovascular disease rates decreased by more than two-thirds (71.0% and 68.8% respectively)
- rates for chronic lower respiratory diseases and other forms of heart disease halved (declining by 53.3% and 50.0% respectively)
- the rate for cancer decreased by 23.6%.

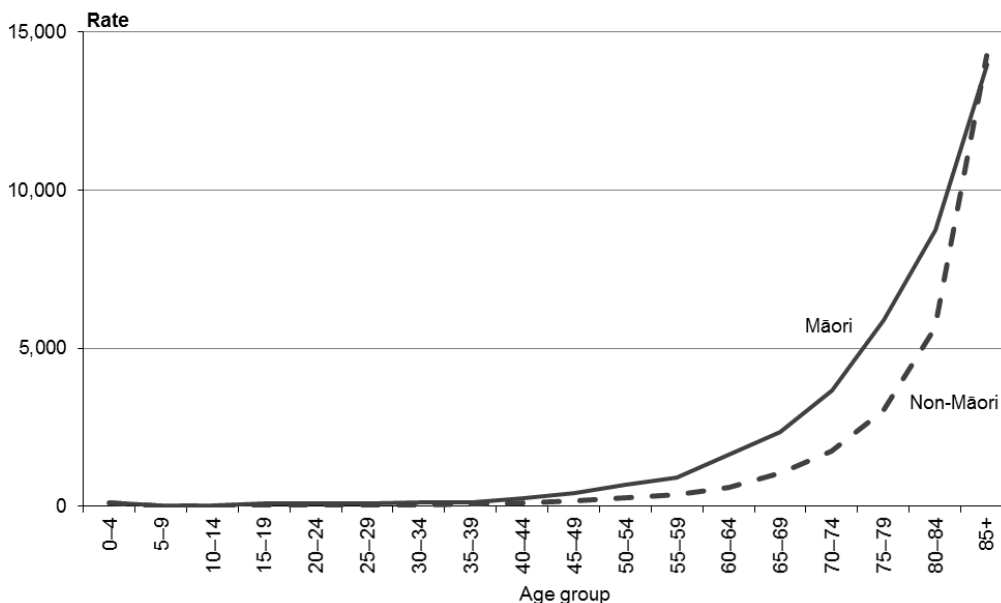
**Figure 4: Mortality rates for the five major causes of mortality, 1980–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

Māori had higher age-specific mortality rates than non-Māori for all five-year age groups under 85 years (Figure 5). Across each of these age groups, the mortality rate for the Māori population ranged from 1.4 to 3.2 times that of the non-Māori population. This ethnic disparity was greatest in those aged 10–14 years, where the Māori rate was more than three times that of the non-Māori rate. For those aged 85 years and over Māori and non-Māori mortality rates were comparable.

**Figure 5: Age at death, rates by ethnicity, 2012**

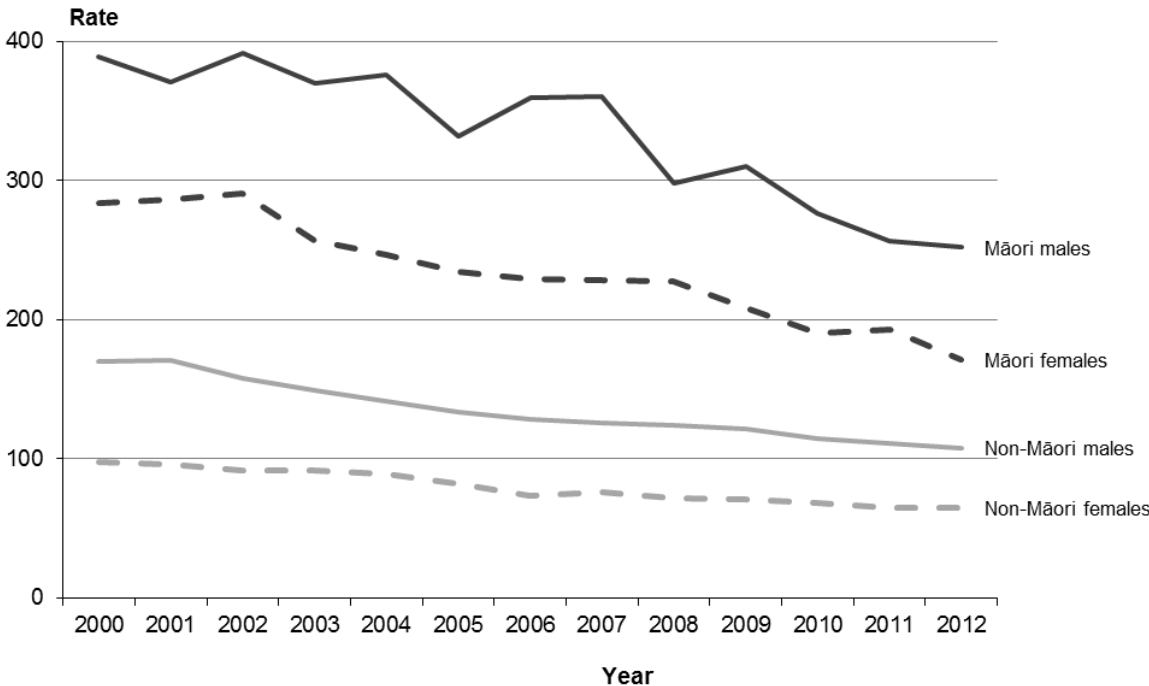


Note: rates per 100,000 population in each age group.

The term ‘amenable mortality’ refers to potentially preventable deaths that might have been prevented if health services had been delivered more effectively or if patients had accessed services earlier (either in primary care or in hospital). Amenable mortality includes deaths from some types of infection and cancer; maternal, perinatal and infant conditions/complications; injuries; and a range of chronic disorders (see ‘Amenable mortality’ within ‘Explanatory notes’ for further information). Figure 6 shows amenable mortality rates for Māori and non-Māori by sex from 2000 to 2012.

From 2000 to 2012 New Zealand’s amenable mortality rate decreased across all groups. Over this time, the rate for Māori was between 2.4 and 2.9 times the rate for non-Māori. For both ethnic groups the amenable mortality rate was higher for males than for females.

**Figure 6: Amenable mortality rates per 100,000 people aged 0–74 years, by sex and ethnicity, 2000–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population aged 0–74 years.

# Selected causes of mortality

Table 3 shows age-standardised mortality rates for selected causes of death for Māori, non-Māori and the total population in 2012.

**Table 3: Mortality rates from selected causes, by sex and ethnicity, 2012**

ICD code	Cause of death	Māori population			Non-Māori population			Total population		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
C00–C96, D45–D47	Total cancer	209.5	192.5	199.4	135.9	101.1	116.5	143.4	109.0	124.0
C33–C34	Lung cancer*	65.4	66.4	65.7	23.9	15.7	19.5	27.1	19.7	23.1
C50	Breast cancer	0.0	26.5	14.5	0.0	16.9	8.9	0.0	17.7	9.4
C61	Prostate cancer	18.1	...	...	16.4	...	...	17.0	...	...
C43	Melanoma of the skin	0.9	0.8	0.8	7.2	3.8	5.4	6.8	3.6	5.1
C53	Cervical cancer	...	3.7	...	...	1.6	...	...	1.8	...
I00–I99	Diseases of the circulatory system	239.1	164.9	199.3	132.7	90.6	111.0	144.6	98.7	120.7
I05–I09	Chronic rheumatic heart disease	3.7	6.6	5.3	1.2	1.4	1.3	1.5	1.8	1.7
I10–I15	Hypertensive disease	11.8	10.5	11.2	3.5	3.2	3.4	4.2	3.7	4.0
I20–I25	Ischaemic heart disease	140.3	77.2	106.2	78.5	40.0	58.0	85.2	43.8	63.0
I30–I52	Other forms of heart disease§	42.7	27.2	34.3	15.8	12.3	14.1	18.3	13.8	16.0
I60–I69	Cerebrovascular disease	30.3	31.7	31.2	25.7	28.4	27.7	27.1	29.6	29.0
J40–J47	Chronic lower respiratory diseases	52.7	53.7	53.0	21.2	16.5	18.3	23.8	19.1	20.9
J40–J44	COPD‡	45.7	46.2	45.8	19.8	14.6	16.7	22.0	16.8	18.8
E10–E14	Diabetes mellitus	48.3	33.8	40.6	9.9	6.6	8.1	12.8	8.6	10.6
X60–X84	Suicide	25.3	10.5	17.6	16.3	5.2	10.6	18.5	6.4	12.3
V00–V99	Transport accidents	28.2	6.3	16.8	10.9	3.6	7.2	13.6	4.0	8.7
V02–V89≠	Motor vehicle accidents	22.4	6.3	14.1	9.3	3.2	6.2	11.3	3.7	7.4
F00–F09	Organic, including symptomatic, mental disorders~	8.4	10.8	10.0	10.6	12.8	12.1	11.0	13.1	12.5
J09–J18	Pneumonia and influenza	11.6	8.7	10.0	7.6	6.8	7.2	8.3	7.2	7.7
Q00–Q99	Congenital anomalies	3.5	2.6	3.0	4.9	2.8	3.9	4.5	3.0	3.7
X85–Y09	Assault	4.3	1.0	2.6	0.8	1.2	1.0	1.4	1.2	1.3
	<b>All causes of death</b>	<b>743.3</b>	<b>567.6</b>	<b>649.3</b>	<b>425.1</b>	<b>305.9</b>	<b>362.0</b>	<b>463.0</b>	<b>332.7</b>	<b>393.6</b>

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

\* Includes cancer of the trachea, bronchus and lung.

‡ Chronic obstructive pulmonary disease.

§ Includes pericardial diseases, valve disorders, myocarditis, cardiomyopathy, conduction disorders, cardiac arrest and heart failure, but excludes chronic rheumatic heart disease.

≠ Selected codes from the V02–V89 range.

~ Includes dementia, amnesic syndrome, delirium and other mental disorders due to brain damage and dysfunction and to physical disease.

... = Not applicable.

The highest mortality rates in the total population in 2012 were from cancer and diseases of the circulatory system (of which ischaemic heart disease and cerebrovascular disease were the top two causes).

The highest mortality rates in the Māori population in 2012 were from cancer and diseases of the circulatory system (of which ischaemic heart disease and chronic lower respiratory diseases were the top two causes).

Lung cancer was the leading cause of cancer death for Māori males, non-Māori males and Māori females in 2012; breast cancer was the leading cause of cancer death for non-Māori females.

## **Sex-based differences in mortality**

Table 3 shows that mortality rates for males were generally higher than for females in 2012. For example, males had a mortality rate:

- for all causes that was 1.4 times the rate for females
- from transport accidents that was more than three times the female rate
- from suicide that was nearly three times the female rate
- from ischaemic heart disease and melanoma that was nearly twice the female rate
- from diabetes, congenital anomalies and lung cancer that was almost 1.5 times the female rate.

Female mortality rates were higher than the equivalent male rates for cerebrovascular disease; organic, including symptomatic, mental disorders; and chronic rheumatic heart disease.

## **Ethnicity-based differences in mortality**

In 2012, Māori had a total mortality rate that was 1.8 times the rate for non-Māori (the age-standardised rates were 649.3 and 362.0 respectively).

Māori had higher mortality rates than non-Māori for most of the causes shown in Table 3, except for melanoma and congenital anomalies.

In 2012, the two largest differences between mortality rates for Māori and non-Māori were for:

- diabetes mellitus, where the rate for Māori was five times that for non-Māori (the age-standardised rates were 40.6 and 8.1 respectively)
- chronic rheumatic heart disease, where the rate for Māori was four times that for non-Māori (the age-standardised rates were 5.3 and 1.3 respectively).

In addition, Māori had mortality rates for lung cancer and hypertensive diseases that were more than three times the equivalent non-Māori rate. Māori rates for chronic lower respiratory diseases (including chronic obstructive pulmonary disease), assault, transport accidents, cervical cancer and other forms of heart disease were at least twice the equivalent non-Māori rates.

Note that the percentages and rates discussed here present a snapshot from 2012. Mortality rates for Māori tend to vary more widely than those for non-Māori, due to the lower number of deaths they are based on. It is useful, whenever possible, to examine the pattern of their incidence over several years. This helps to determine whether the mortality figures for a particular year and condition are a statistical spike or representative of the general trend.

Selected causes of death, broken down by sex and ethnicity, are discussed further in 'Selected trends'.

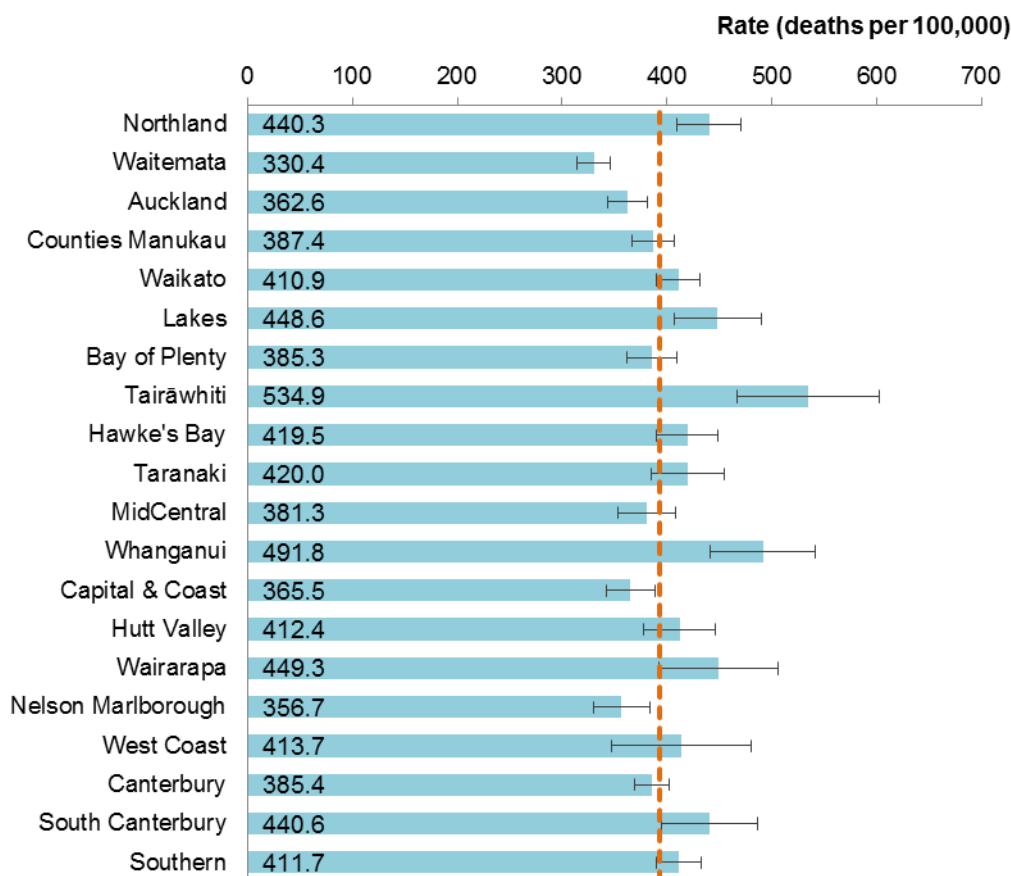
# Mortality by region

This section presents mortality data by district health board (DHB) region of residence by age-standardised rate. Note that the populations used in this section are different to the populations used in the remainder of the publication. This means that some results in this section differ very slightly from those given in other sections (see 'Population' within 'Explanatory notes').

## Total population

Figure 7 presents the mortality rate and the 99% confidence intervals for each DHB region for 2012. Four DHB regions had mortality rates that were significantly lower than the national rate: Waitemata, Nelson Marlborough, Auckland and Capital & Coast. Five had mortality rates that were significantly higher than the national rate: Tairāwhiti, Whanganui, Lakes, Northland and South Canterbury. The remaining DHB regions had rates with 99% confidence limits that overlapped with the New Zealand mortality rate, meaning they were not significantly different from the national rate (see 'Confidence intervals' within 'Explanatory notes').

**Figure 7: Mortality rates, by DHB region, total population, 2012**



**Notes:**

The dashed vertical line is the national rate.

Rates per 100,000 population, age-standardised to WHO World Standard Population; 99% confidence intervals.

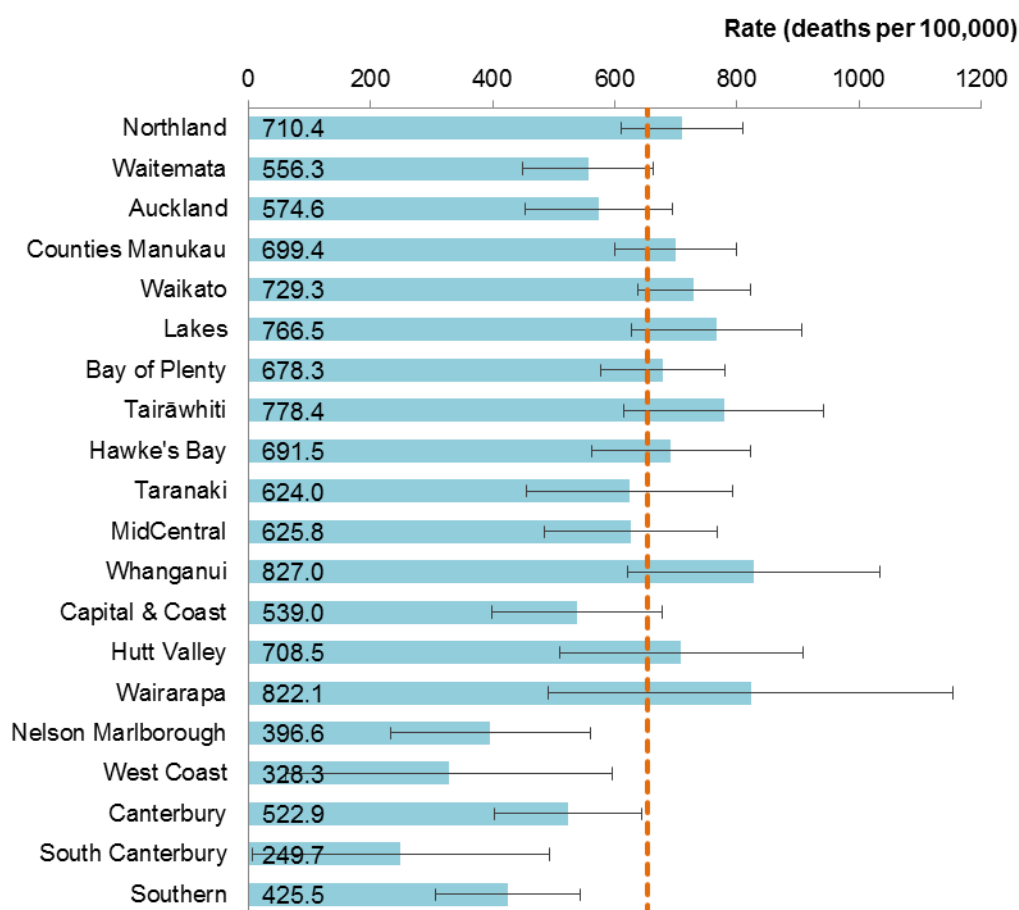
## Māori and non-Māori mortality by DHB region

Figure 8 shows mortality rates by DHB region of residence for Māori in 2012 compared with the national mortality rate for Māori.

All five DHBs in the South Island (South Canterbury, West Coast, Nelson Marlborough, Southern and Canterbury) had a mortality rate for Māori that was significantly lower than the national rate. No DHB had a rate that was significantly higher than the national rate. South Canterbury DHB had the lowest Māori mortality rate (249.7 deaths per 100,000). Whanganui and Wairarapa DHBs had the highest Māori mortality rates (827.0 and 822.1 deaths per 100,000 respectively).

The rates for some DHBs have very wide confidence intervals, due to low mortality numbers (eg, South Canterbury (7) and West Coast (10)). Rates for these DHBs should be interpreted with caution.

**Figure 8: Mortality rates, by DHB region, Māori population, 2012**



Notes:

The dashed vertical line is the national rate for Māori.

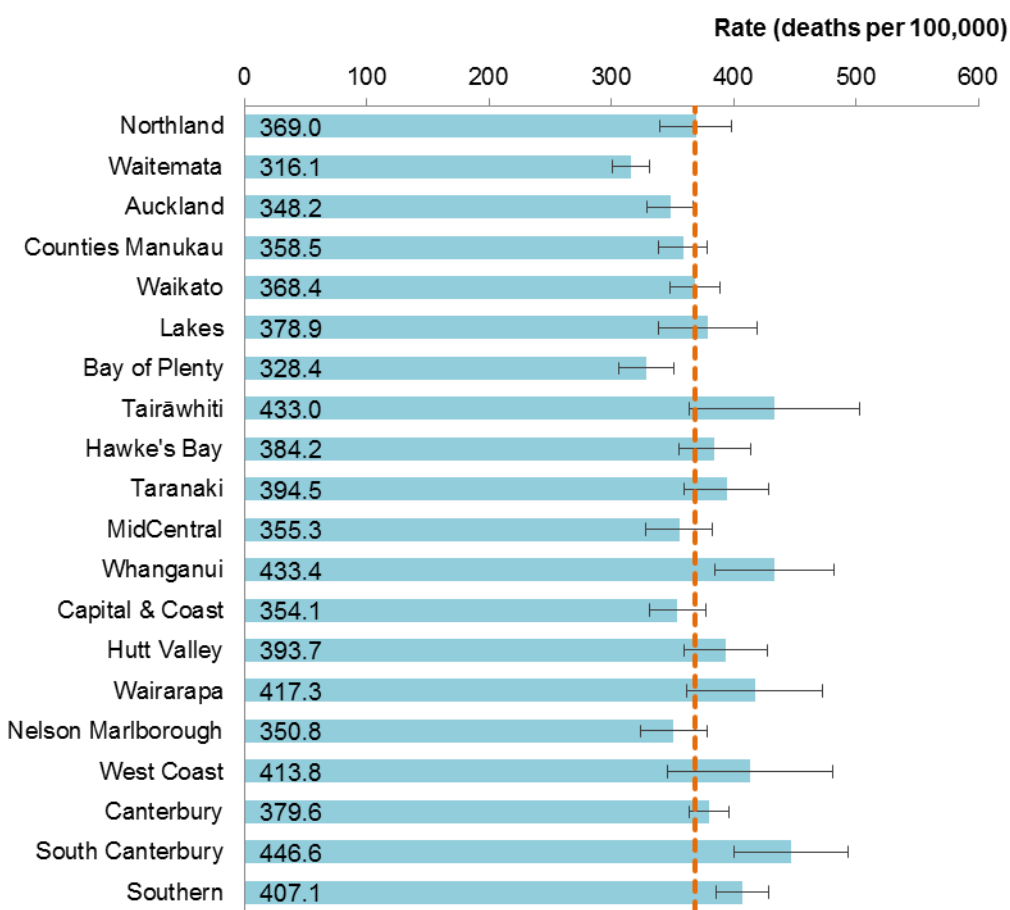
Rates per 100,000 Māori population, age-standardised to WHO World Standard Population; 99% confidence intervals.

Figure 9 shows mortality rates by DHB region for non-Māori in 2012 compared with the rate for all non-Māori.

Six DHB regions had a mortality rate for non-Māori that was significantly different from the national rate; three were higher (South Canterbury, Whanganui and Southern) and three were lower (Waitemata, Bay of Plenty and Auckland).

The DHB regions with the highest mortality rates for the non-Māori population were South Canterbury (446.6 deaths per 100,000), Whanganui (433.4 per 100,000) and Tairāwhiti (433.0 per 100,000). The DHB region with the lowest non-Māori mortality rate was Waitemata (316.1 per 100,000).

**Figure 9: Mortality rates, by DHB region, non-Māori population, 2012**



Notes:

The dashed vertical line is the national rate for non-Māori.

Rates per 100,000 non-Māori population, age-standardised to WHO World Standard Population; 99% confidence intervals.



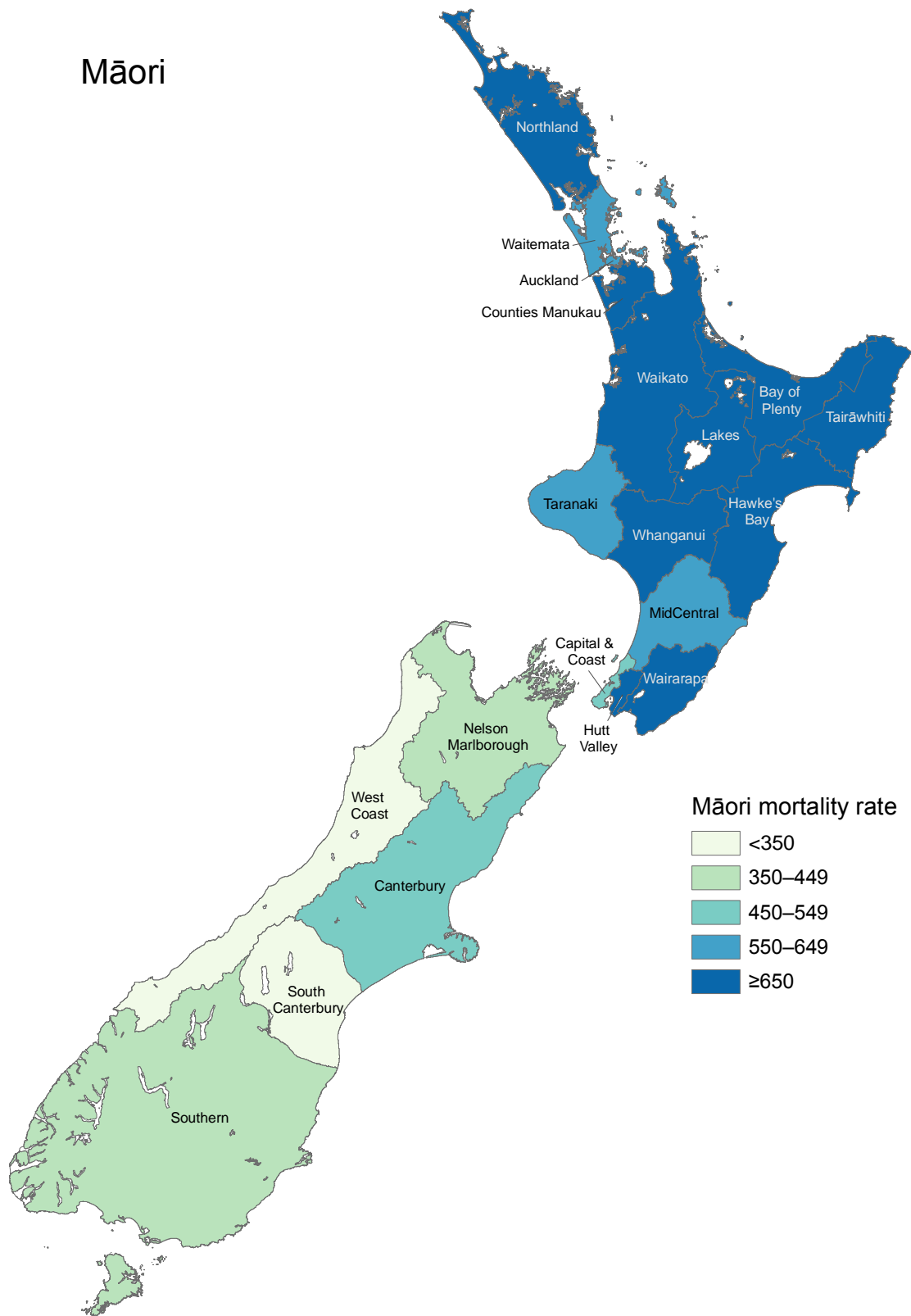
Figure 10 combines the same information as Figures 8 and 9 in map form. The different shades shown on the maps distinguish ranges in DHB rates, lighter shades represent lower rates and darker shades represent higher rates. Mortality rates for Māori were generally higher than the corresponding rates for non-Māori, particularly in the North Island.

Some factors that influence regional mortality rates have not been adjusted for in the data presented. They include:

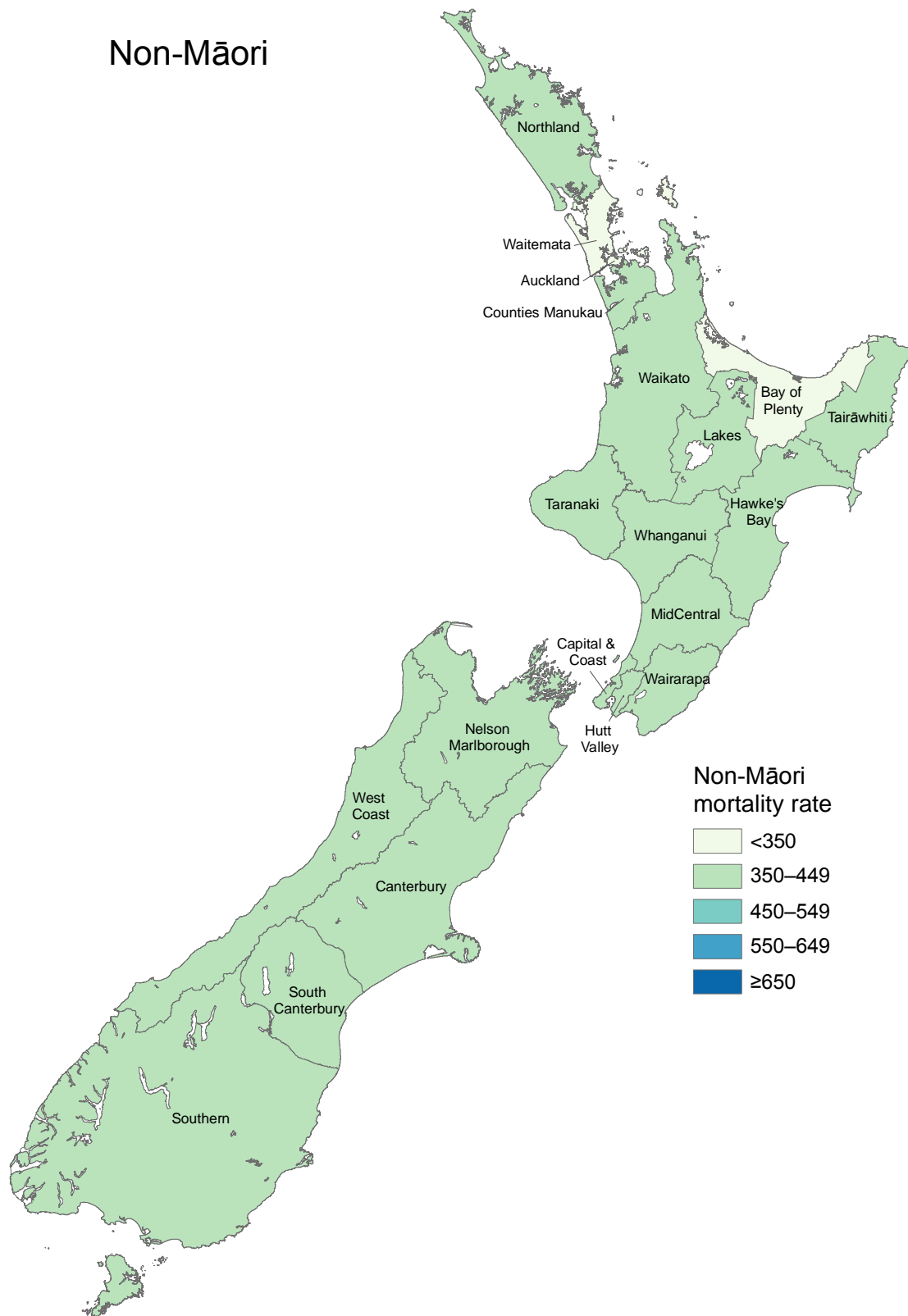
- demographic factors (such as sex, ethnicity, deprivation and socioeconomic status)
- geographic factors (such as the average distance travelled to access health services)
- population risk factors (such as smoking rates, obesity rates, diabetes rates, mix of occupations and occupational mortality rates, and population health literacy).

For example, different regions have different proportions of Māori in their populations, and Māori exhibit higher rates of mortality. Similarly, smoking and obesity rates are known to be higher among people living in more deprived areas (Ministry of Health 2012), and some DHBs have a relatively higher proportion of such areas. This data cannot be used to assess the quality of care being provided by DHBs to their populations.

**Figure 10: Comparison of DHB region mortality rates for Māori and non-Māori, 2012**



# Non-Māori



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

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# Selected trends

This section examines mortality statistics for several conditions in greater depth. These analyses, while addressing the most salient conditions, are not intended to be a definitive account of the mortality and health issues facing the New Zealand population.

Conditions covered in this section are:

- all cancers (malignant neoplasm)
- lung cancer (malignant neoplasm of the trachea, bronchus and lung)
- female breast cancer (malignant neoplasm of the female breast)
- prostate cancer (malignant neoplasm of the prostate)
- melanoma of the skin (malignant melanoma of the skin)
- cervical cancer (malignant neoplasm of the cervix uteri)
- ischaemic heart disease (angina pectoris, myocardial infarction and other forms of acute and chronic ischaemic heart disease)
- cerebrovascular disease (cerebral haemorrhage (subarachnoid, intracerebral and other non-traumatic), cerebral infarction, occlusion and stenosis of precerebral and cerebral arteries and other cerebrovascular diseases)
- diabetes mellitus, Type 1 (insulin dependent) and Type 2 (adult onset diabetes)
- motor vehicle accidents (accidents associated with motorised land transport)
- suicide (intentional self-harm)
- maternal mortality (direct and indirect obstetric deaths).

# All cancers

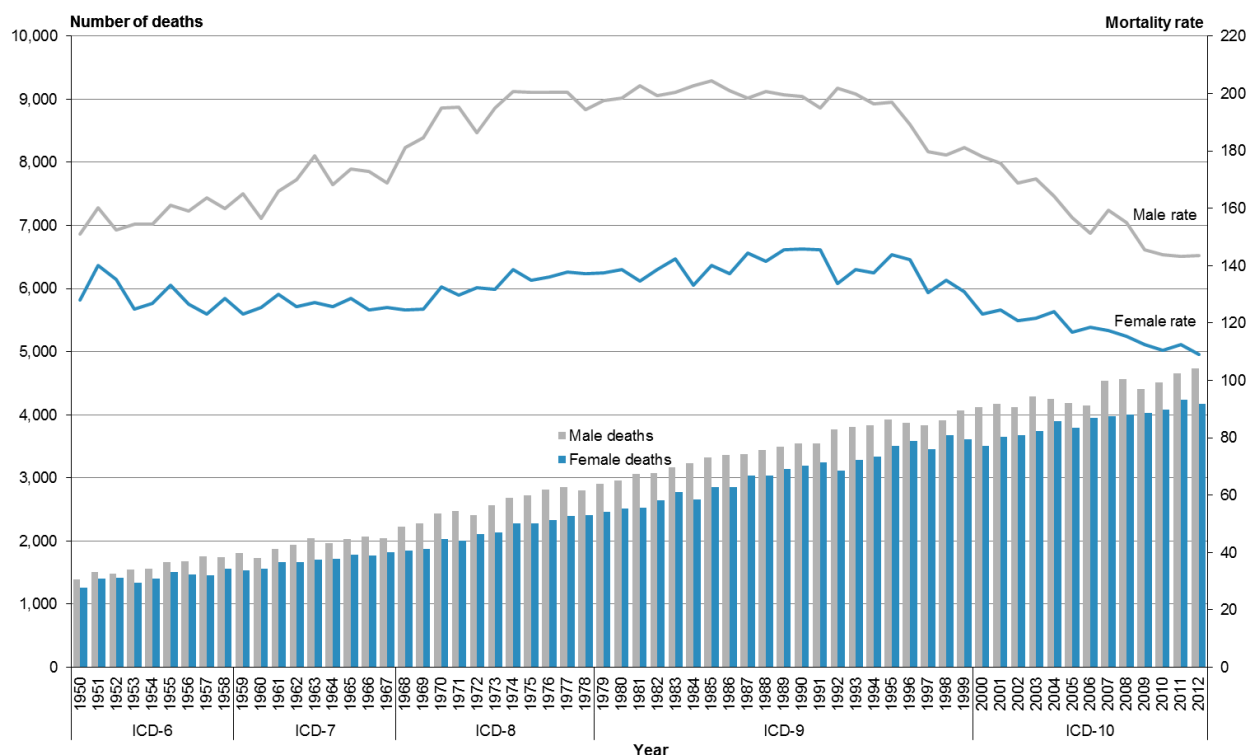
Cancer, or malignant neoplasm (an abnormal growth of tissue), is a general term that covers a large number of diseases. This section is concerned with the total mortality impact of all cancers. Collectively, cancers are a major cause of mortality in the New Zealand population. In this report, data for all cancers combined includes ICD codes C00–C96 and D45–D47.

Cancer was the leading cause of death for both males and females in 2012. There were 8905 deaths from cancer in this year (4735 males and 4170 females). For males the most common cancer deaths were from lung cancer, colorectal cancer, prostate and pancreatic cancer, and melanoma. For females the most common cancer deaths were from lung, colorectal, breast, pancreatic and ovarian cancer.

Figure 11 shows how the numbers and mortality rates from cancer changed from 1950 to 2012. Although the number of deaths increased steadily for both males and females, matching the general rise in population, the rate shows a different trend.

The rate for males showed a general increase, with a peak in 1985 and then a gradual decline to below the levels seen in the 1950s. The female rate showed more stability, reaching its highest level in 1990 and its lowest level in 2012.

**Figure 11: Number of deaths and mortality rates from all cancers, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

In 2012 the cancer mortality rate for males was 1.3 times the female rate. Males consistently had a higher mortality rate than females from 1980 to 2012 (Table 4). Mortality rates generally declined over this time; the rate for males in 2012 was 27.7% lower than the equivalent rate in 1980, and the female rate was 21.3% lower.

**Table 4: Number of deaths and mortality rates from all cancers, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	2952	198.4	2513	138.5	5465	162.3
1981	3061	202.6	2527	134.6	5588	162.2
1982	3076	199.3	2647	138.7	5723	162.6
1983	3166	200.4	2771	142.3	5937	165.7
1984	3237	202.7	2651	133.1	5888	160.8
1985	3318	204.5	2849	140.2	6167	165.6
1986	3364	200.9	2857	137.2	6221	163.1
1987	3375	198.5	3035	144.3	6410	165.8
1988	3444	200.6	3037	141.5	6481	165.2
1989	3492	199.6	3139	145.6	6631	166.9
1990	3548	199.0	3198	145.7	6746	166.2
1991	3541	195.1	3251	145.4	6792	165.2
1992	3771	201.7	3110	133.8	6881	161.5
1993	3812	199.8	3282	138.6	7094	163.4
1994	3834	196.3	3332	137.6	7166	161.3
1995	3918	196.9	3504	143.8	7422	164.5
1996	3872	189.3	3589	142.1	7461	160.8
1997	3834	179.6	3448	130.7	7282	150.6
1998	3911	178.5	3671	134.9	7582	152.4
1999	4063	181.3	3611	130.7	7674	151.4
2000	4120	178.1	3500	123.2	7620	146.1
2001	4166	175.7	3644	124.6	7810	145.5
2002	4125	168.9	3675	120.9	7800	140.7
2003	4292	170.1	3735	121.7	8027	141.8
2004	4246	164.1	3899	124.1	8145	140.7
2005	4184	156.6	3787	116.9	7971	133.6
2006	4144	151.3	3950	118.5	8094	132.4
2007	4539	159.4	3980	117.3	8519	135.1
2008	4561	154.9	4005	115.3	8566	132.3
2009	4402	145.4	4035	112.6	8437	126.8
2010	4511	143.9	4082	110.6	8593	125.2
2011	4650	143.3	4241	112.6	8891	125.9
2012	4735	143.4	4170	109.0	8905	124.0

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

In 2012, the mortality rate from all cancers for Māori was 199.4 deaths per 100,000 Māori. For non-Māori the mortality rate was 116.5 deaths per 100,000 non-Māori.

The distribution of cancer-related deaths was skewed toward the 65 years and over age group. However, a large proportion of cancer-related deaths also occurred in the 45–64 years age band. Cancer deaths were relatively rare in people aged under 45 years (Table 5).

**Table 5: Age distribution of deaths from all cancers, percentages and rates, by ethnicity and sex, 2012**

Age group (years)	Percentage						Age-specific mortality rate					
	Māori			Non-Māori			Māori			Non-Māori		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
<25	2.0	1.6	1.8	0.5	0.5	0.5	4.9	4.5	4.7	3.3	3.0	3.2
25–44	5.2	5.1	5.1	2.0	3.8	2.8	29.2	28.1	28.6	17.2	27.4	22.5
45–64	36.1	42.8	39.6	19.7	22.6	21.0	282.1	335.7	310.4	173.3	161.9	167.5
65+	56.7	50.5	53.4	77.9	73.1	75.7	1597.4	1349.2	1462.0	1261.3	861.3	1045.1

Note: rates per 100,000 population.

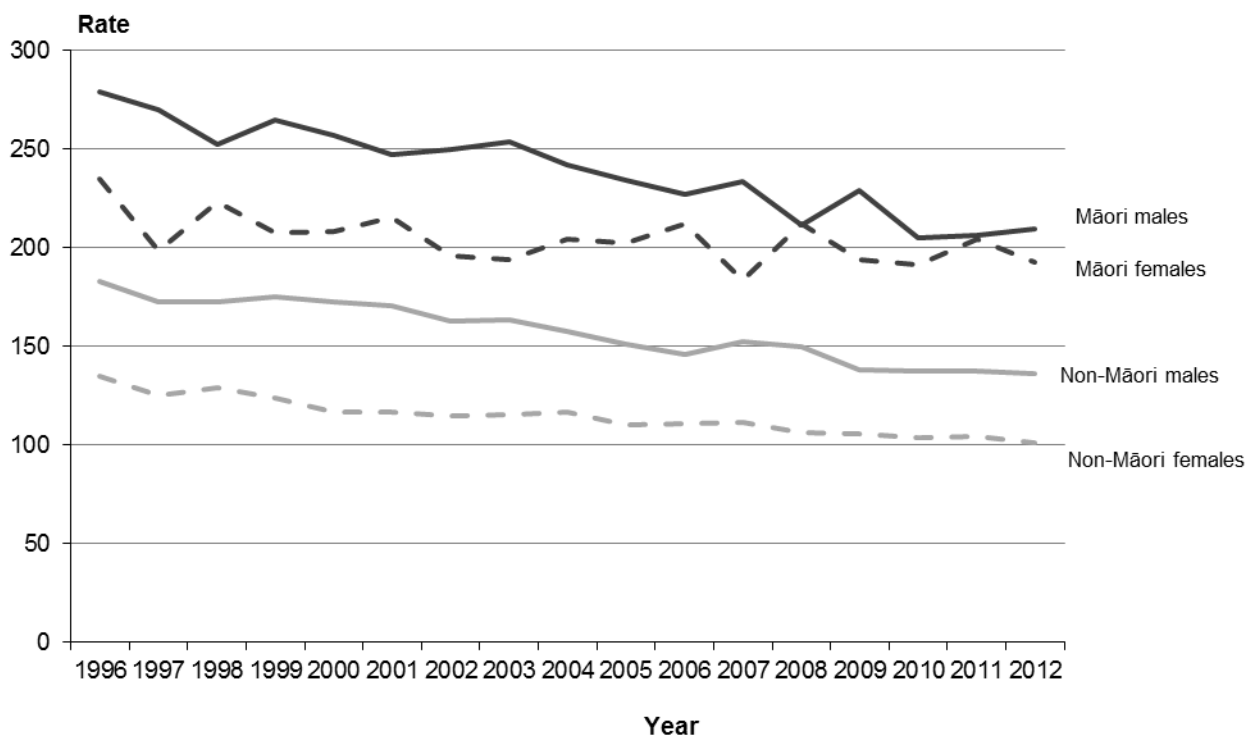
Compared with non-Māori, a greater proportion of Māori deaths occurred in the youngest three age groups (almost half of Māori cancer deaths occurred in those aged less than 65; for non-Māori this figure was 24.3%).

Between 1996 and 2012, the Māori population had a consistently higher rate of cancer deaths than the non-Māori population. Māori males had a higher rate than Māori females in every year except 2008 (Figure 12).

There was a significant difference in cancer mortality rates between non-Māori males and non-Māori females between 1996 and 2012 (using 95% confidence intervals).<sup>2</sup> The difference between the rates for Māori males and Māori females was not significant in 2012.

In 2012, the rate of cancer deaths for Māori males was 1.5 times that for non-Māori males. The rate for Māori females was 1.9 times that for non-Māori females.

**Figure 12: Mortality rates from all cancers, by sex and ethnicity, 1996–2012**



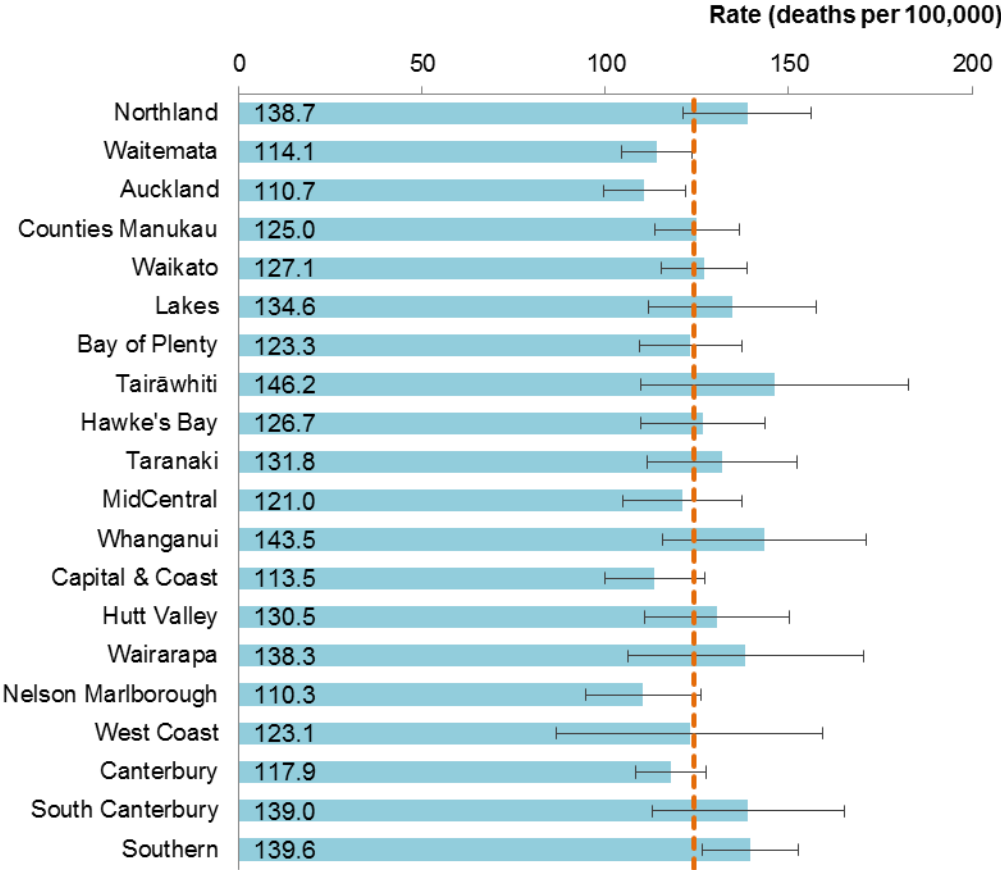
Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

<sup>2</sup> Confidence intervals were calculated for all rates, although they are not shown in Figure 12. For more information on confidence intervals, see 'Statistical notes'.



Figure 13 shows cancer mortality rates by DHB region for the total population in 2012. One DHB (Southern) showed a rate that was significantly above the national rate; two DHBs had rates that were significantly lower (Auckland and Waitemata). All other DHBs had rates that were not significantly different to the New Zealand rate.

**Figure 13: Mortality rates from all cancers, by DHB region, total population, 2012**



**Notes:**

The dashed vertical line is the national rate.  
 Rates per 100,000 population, age-standardised to WHO World Standard Population;  
 99% confidence intervals.

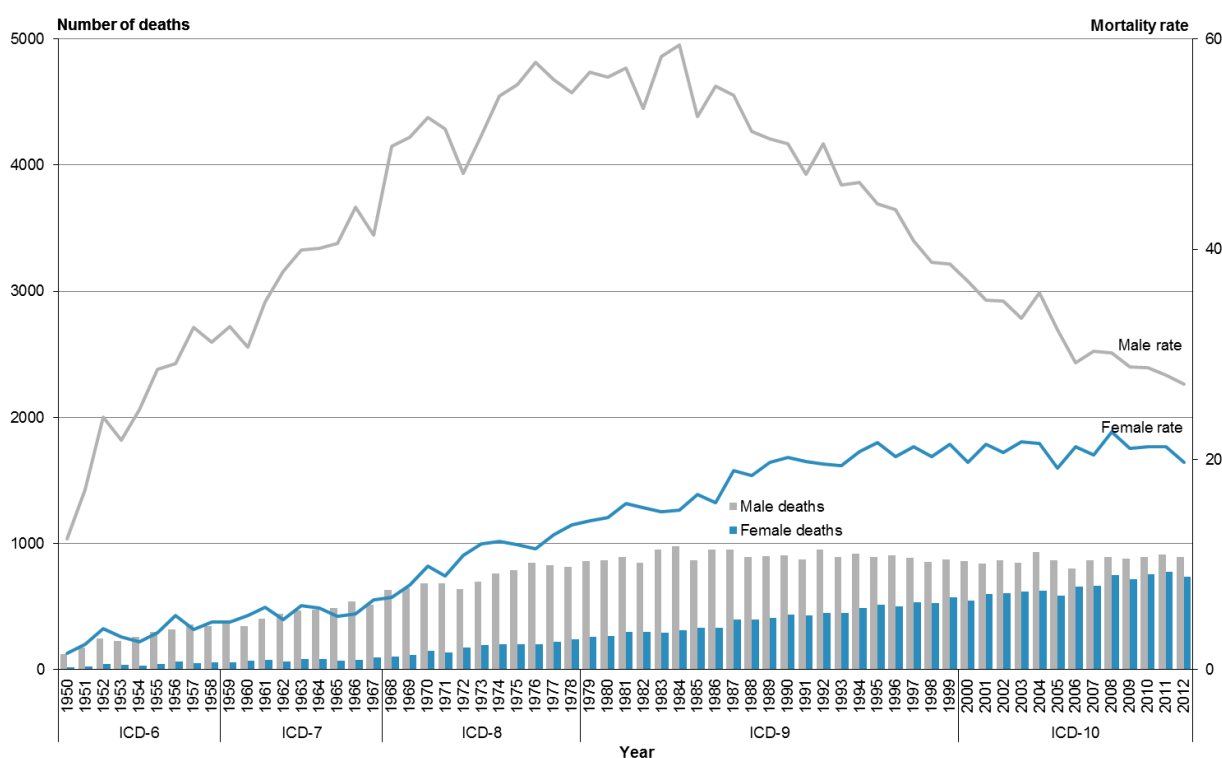
# Lung cancer

This section covers ICD codes C33 and C34 (C33: malignant neoplasm of trachea; C34: malignant neoplasm of bronchus and lung). In this publication, these conditions are collectively referred to as lung cancer.

Lung cancer was the leading cause of cancer death in 2012, accounting for 18.3% of cancer deaths (1628 deaths). The majority of those who died from lung cancer were males (54.7%). In 2012, the mortality rate for males was higher than the female rate (27.1 deaths per 100,000 males compared to 19.7 deaths per 100,000 females).

Figure 14 shows trends in numbers and rates of death from lung cancer for both males and females from 1950 to 2012. Mortality rates for males peaked in the mid-1980s and then showed a strong downward trend. Female rates showed a general upward trend from 1950 before stabilising in the 1990s.

**Figure 14: Number of deaths mortality rates from lung cancer, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

Table 6 shows deaths from lung cancer from 1980 to 2012. The mortality rate for males declined by more than half over this time (51.9%), while the rate for females showed the opposite trend, increasing by 36.2%. The number of male deaths in 2012 was comparable to the number of male deaths in 1980. For females, the number of deaths in 2012 was almost three times the number of deaths in 1980.

**Table 6: Number of deaths and mortality rates from lung cancer, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	868	56.4	265	14.5	1133	32.8
1981	889	57.3	298	15.8	1187	33.8
1982	844	53.4	298	15.4	1142	31.7
1983	948	58.3	291	15.0	1239	34.0
1984	975	59.4	307	15.2	1282	34.4
1985	866	52.6	331	16.6	1197	31.9
1986	949	55.5	329	15.9	1278	33.1
1987	950	54.7	396	18.9	1346	34.5
1988	892	51.2	395	18.4	1287	32.7
1989	896	50.5	411	19.7	1307	32.9
1990	903	50.0	433	20.2	1336	33.0
1991	869	47.1	427	19.8	1296	31.6
1992	947	50.0	445	19.5	1392	32.5
1993	892	46.1	444	19.4	1336	30.9
1994	919	46.3	484	20.7	1403	31.7
1995	892	44.3	514	21.6	1406	31.5
1996	904	43.8	502	20.2	1406	30.5
1997	882	40.8	530	21.2	1412	29.6
1998	855	38.8	526	20.2	1381	28.1
1999	874	38.6	569	21.4	1443	28.8
2000	860	37.0	546	19.7	1406	27.3
2001	841	35.1	594	21.4	1435	27.3
2002	866	35.1	605	20.7	1471	26.9
2003	848	33.4	618	21.6	1466	26.6
2004	929	35.9	626	21.5	1555	27.8
2005	864	32.3	587	19.2	1451	25.0
2006	798	29.2	659	21.2	1457	24.7
2007	864	30.3	664	20.4	1528	24.7
2008	889	30.1	745	22.6	1634	25.7
2009	876	28.8	717	21.0	1593	24.4
2010	893	28.7	757	21.2	1650	24.6
2011	909	28.0	773	21.2	1682	24.2
2012	891	27.1	737	19.7	1628	23.1

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

The great majority of lung cancer deaths occurred in those aged 45 years and over (Table 7). Among Māori, a greater percentage of deaths occurred in those aged 45–64 years (the percentage for this age group was almost twice that of the equivalent non-Māori percentage), and the Māori age-specific rate was 3.6 times that of non-Māori. In the 65 years and over age group, the Māori rate was three times that of non-Māori.

**Table 7: Age distribution of deaths from lung cancer, percentages and rates, by ethnicity and sex, 2012**

Age group (years)	Percentage						Age-specific rate					
	Māori			Non-Māori			Māori			Non-Māori		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
<25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25–44	2.9	1.8	2.3	1.1	1.4	1.2	5.1	3.4	4.2	1.6	1.6	1.6
45–64	35.7	41.7	39.0	21.8	20.7	21.4	88.7	110.8	100.4	33.6	23.1	28.2
65+	61.4	56.5	58.8	77.1	77.9	77.4	549.5	512.7	529.2	218.5	142.0	177.1

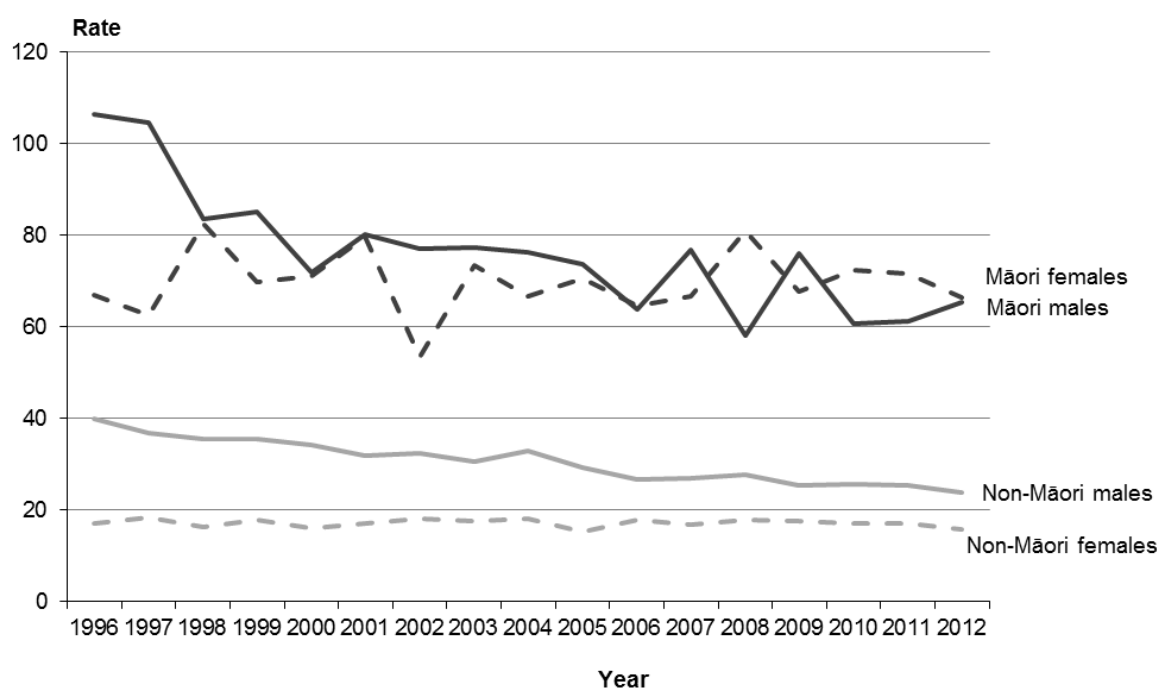
Note: rates per 100,000 population.

In 2012, the mortality rate from lung cancer for Māori was 65.7 deaths per 100,000. The mortality rate for non-Māori was 19.5 deaths per 100,000.

The mortality rate from lung cancer in Māori males was 2.7 times that for non-Māori males in 2012 (Figure 15). The rate for Māori females was more than four times that for non-Māori females.

Between 1996 and 2012, mortality rates for Māori males and females from lung cancer were higher than the equivalent non-Māori rates. During this period, the mortality rate for Māori males from lung cancer decreased by 38.5%, while the Māori female rate showed no obvious trend.

**Figure 15: Mortality rates from lung cancer, by sex and ethnicity, 1996–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

# Female breast cancer

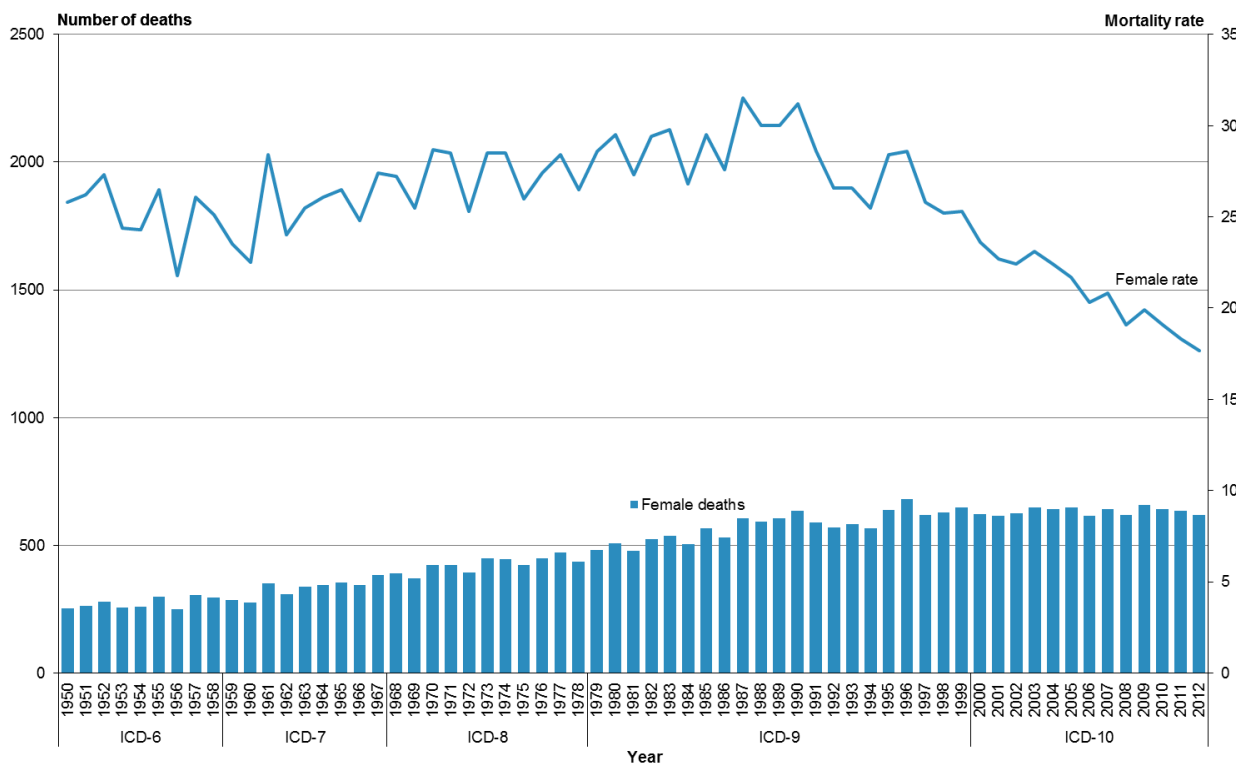
Breast cancer was the third leading cause of cancer death among females in 2012 after lung and colorectal cancer.<sup>3</sup> National breast screening commenced at the end of 1998 for women aged 50–69 years; from July 2008 the minimum screening age was lowered to 45.<sup>4</sup>

This section covers ICD code C50 (malignant neoplasm of breast).

A total of 617 females died from breast cancer in 2012; this accounted for 14.8% of female deaths from cancer.

Although the number of deaths due to breast cancer increased between 1950 and 2012, when adjusted for age and the change in population, the rate showed a general downward trend after the mid-1980s (Figure 16). The mortality rate for 2012 (17.7 deaths per 100,000 females) was the lowest over the entire period.

**Figure 16: Number of deaths and mortality rates from breast cancer in females, 1950–2012**



Note: rates per 100,000 female population, age-standardised to WHO World Standard Population.

<sup>3</sup> This section discusses cancer of the female breast; breast cancer can occur in males but is rare (there was one male death in 2012).

<sup>4</sup> For further information on the BreastScreen Aotearoa programme, see the National Screening Unit’s website: [www.nsu.govt.nz](http://www.nsu.govt.nz)

From 1980 to 2012 the number of female deaths increased, reaching a peak in 1996 before stabilising. Over this time the mortality rate for females from breast cancer decreased by 40.1% (Table 8).

**Table 8: Number of deaths and mortality rates from breast cancer in females, 1980–2012**

Year	No.	Rate
1980	509	29.5
1981	478	27.3
1982	524	29.4
1983	537	29.8
1984	504	26.8
1985	565	29.5
1986	529	27.6
1987	607	31.5
1988	593	30.0
1989	605	30.0
1990	635	31.2
1991	588	28.6
1992	569	26.6
1993	584	26.6
1994	567	25.5
1995	638	28.4
1996	681	28.6
1997	620	25.8
1998	629	25.2
1999	647	25.3
2000	622	23.6
2001	615	22.7
2002	625	22.4
2003	647	23.1
2004	642	22.4
2005	648	21.7
2006	614	20.3
2007	643	20.8
2008	618	19.1
2009	658	19.9
2010	641	19.1
2011	636	18.3
2012	617	17.7

Note: rates per 100,000 female population, age-standardised to WHO World Standard Population.

For Māori, the highest proportion of deaths from breast cancer was in women aged 45–64 years; this age group accounted for 60.3% of Māori deaths from breast cancer. For non-Māori women, the highest proportion was in women aged 65 and over; accounting for 57.2% of non-Māori breast cancer deaths (Table 9).

**Table 9: Age distribution of deaths from breast cancer in females, percentages and rates, by ethnicity, 2012**

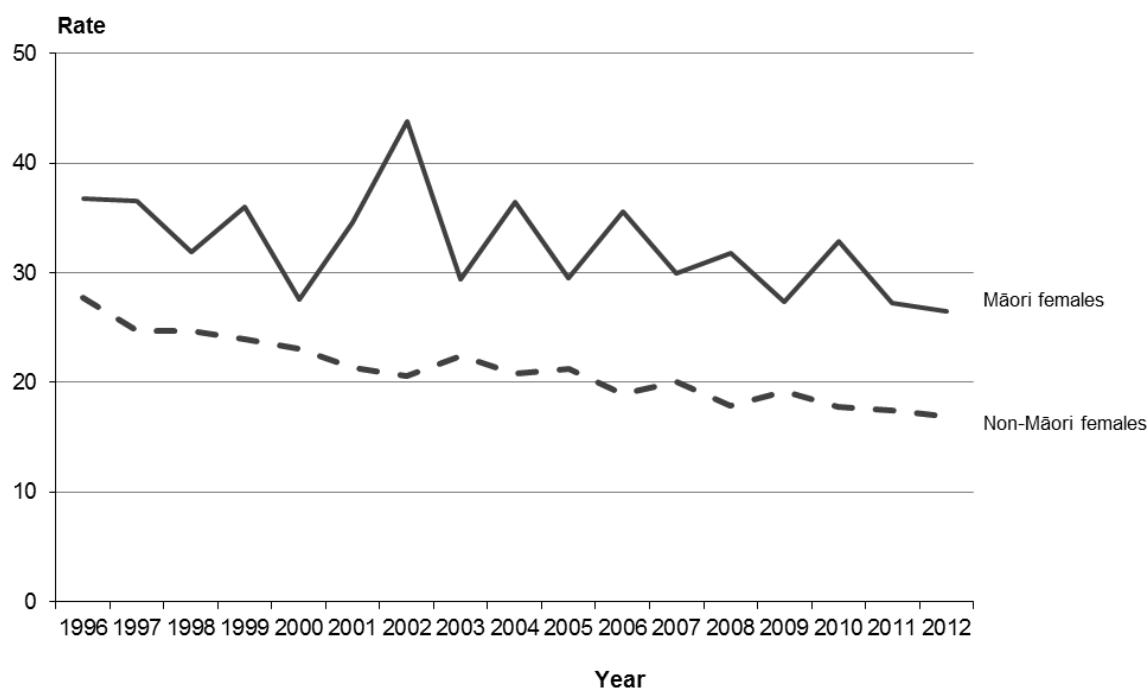
Age group (years)	Percentage		Age-specific rate	
	Māori female	Non-Māori female	Māori female	Non-Māori female
<25	0.0	0.0	0.0	0.0
25–44	9.6	7.9	7.9	8.4
45–64	60.3	34.9	69.7	37.1
65+	30.1	57.2	118.7	99.7

Note: rates per 100,000 population.

In 2012, Māori females had a breast cancer mortality rate that was 1.6 times the non-Māori rate (Figure 17). There were 26.5 deaths per 100,000 Māori females, compared to 16.9 deaths per 100,000 non-Māori females.

For most years from 1996 to 2012, Māori rates were significantly higher than non-Māori rates (using 95% confidence intervals).<sup>5</sup> The Māori mortality rate for breast cancer shows greater variability than that of non-Māori. This may be partially explained by the lower number of Māori deaths (73 in 2012). There was no significant change in breast cancer death rates among Māori between 1996 and 2012. For non-Māori females, the mortality rate for 2012 was significantly lower than the 1996 rate.

**Figure 17: Mortality rates from breast cancer in females, by ethnicity, 1996–2012**



Note: rates per 100,000 female population, age-standardised to WHO World Standard Population.

<sup>5</sup> Confidence intervals were calculated for all rates, although they are not shown in Figure 17. For more information on confidence intervals, see “Confidence intervals’ within ‘Statistical notes’.

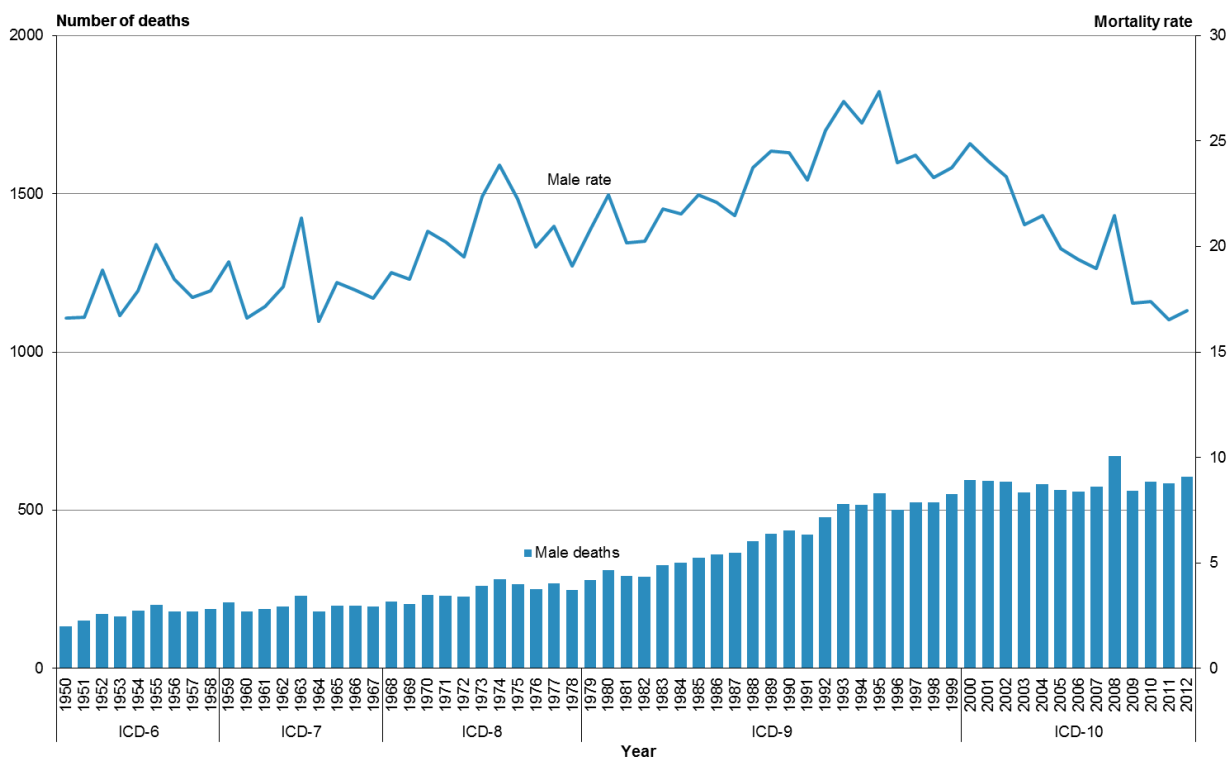
# Prostate cancer

Prostate cancer was the most common cancer registered for males in 2012,<sup>6</sup> and was also the third leading cause of male cancer death. This section covers ICD code C61 (malignant neoplasm of prostate).

There were 607 deaths from prostate cancer in 2012 (an age-standardised rate of 17.0 deaths per 100,000 male population), accounting for 12.8% of total male cancer deaths.

Between 1950 and 2012 mortality rates from prostate cancer showed an overall increase until a peak in 1995 (Figure 18). Thereafter, rates showed a downward trend. The 2012 rate was similar to rates in the 1950s. Over that time, the number of deaths from prostate cancer steadily increased to reach a peak in 2008 before stabilising.

**Figure 18: Number of deaths and mortality rates from prostate cancer, 1950–2012**



Note: rates per 100,000 male population, age-standardised to WHO World Standard Population.

<sup>6</sup> See the publication series Cancer: New Registrations and Deaths at [www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/cancer-new-registrations-and-deaths-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/cancer-new-registrations-and-deaths-series)



Table 10 shows numbers and mortality rates for prostate cancer deaths between 1980 and 2012. Over this time the mortality rate declined by 24.4%.

**Table 10: Number of deaths and mortality rates from prostate cancer, 1980–2012**

Year	No.	Rate
1980	311	22.4
1981	293	20.2
1982	289	20.3
1983	325	21.8
1984	335	21.5
1985	351	22.5
1986	360	22.1
1987	365	21.5
1988	402	23.7
1989	425	24.5
1990	436	24.5
1991	423	23.1
1992	478	25.5
1993	520	26.9
1994	517	25.8
1995	554	27.3
1996	502	24.0
1997	525	24.3
1998	524	23.3
1999	552	23.8
2000	594	24.9
2001	592	24.1
2002	591	23.3
2003	556	21.0
2004	583	21.5
2005	564	19.9
2006	559	19.4
2007	574	19.0
2008	670	21.5
2009	562	17.3
2010	589	17.4
2011	585	16.5
2012	607	17.0

Note: rates per 100,000 male population, age-standardised to WHO World Standard Population.

Prostate cancer mortality in 2012 primarily occurred in the 65 and over age group, for both Māori and non-Māori (Table 11). The distribution of deaths for this particular cancer was more skewed toward the older age group than it was for cancer deaths as a whole.

**Table 11: Age distribution of deaths from prostate cancer in males, percentages and rates, by ethnicity, 2012**

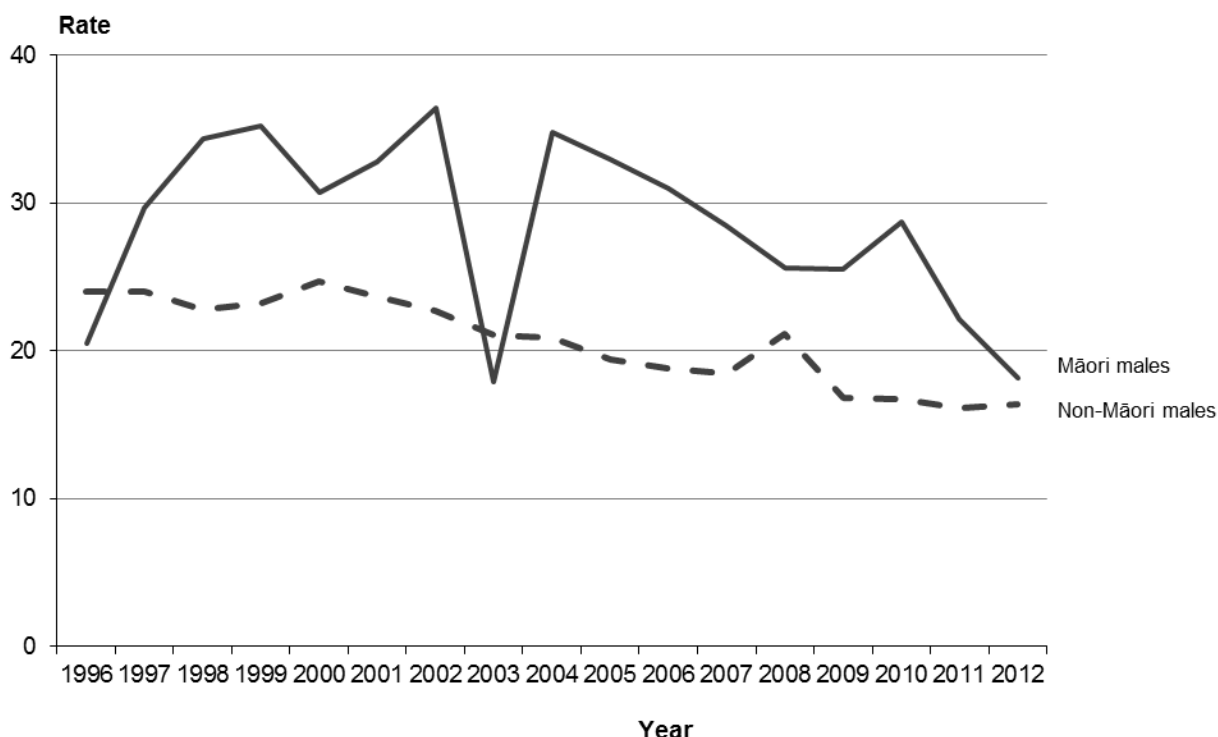
Age group (years)	Percentage		Age-specific rate	
	Māori male	Non-Māori male	Māori male	Non-Māori male
<25	0.0	0.0	0.0	0.0
25–44	0.0	0.0	0.0	0.0
45–64	15.6	6.8	8.9	8.0
65+	84.4	93.2	172.5	202.2

Note: rates per 100,000 male population.

In 2012 the mortality rate for Māori from prostate cancer was marginally higher (10.6% higher) than the rate for non-Māori (Figure 19). There were 18.1 deaths per 100,000 Māori males, compared to 16.4 deaths per 100,000 non-Māori males.

Between 1996 and 2012, the mortality rate for Māori was highly variable; the 1996 rate was not significantly different to the 2012 rate (using 95% confidence intervals).<sup>7</sup> Over this time period there was an overall decrease in the mortality rate for prostate cancer in non-Māori; the 2012 rate was significantly lower than the 1996 rate.

**Figure 19: Mortality rates from prostate cancer, by ethnicity, 1996–2012**



Note: rates per 100,000 male population, age-standardised to WHO World Standard Population.

<sup>7</sup> Confidence intervals were calculated for all rates, although they are not shown in Figure 19. For more information on confidence intervals, see ‘Confidence intervals’ within ‘Statistical notes’.

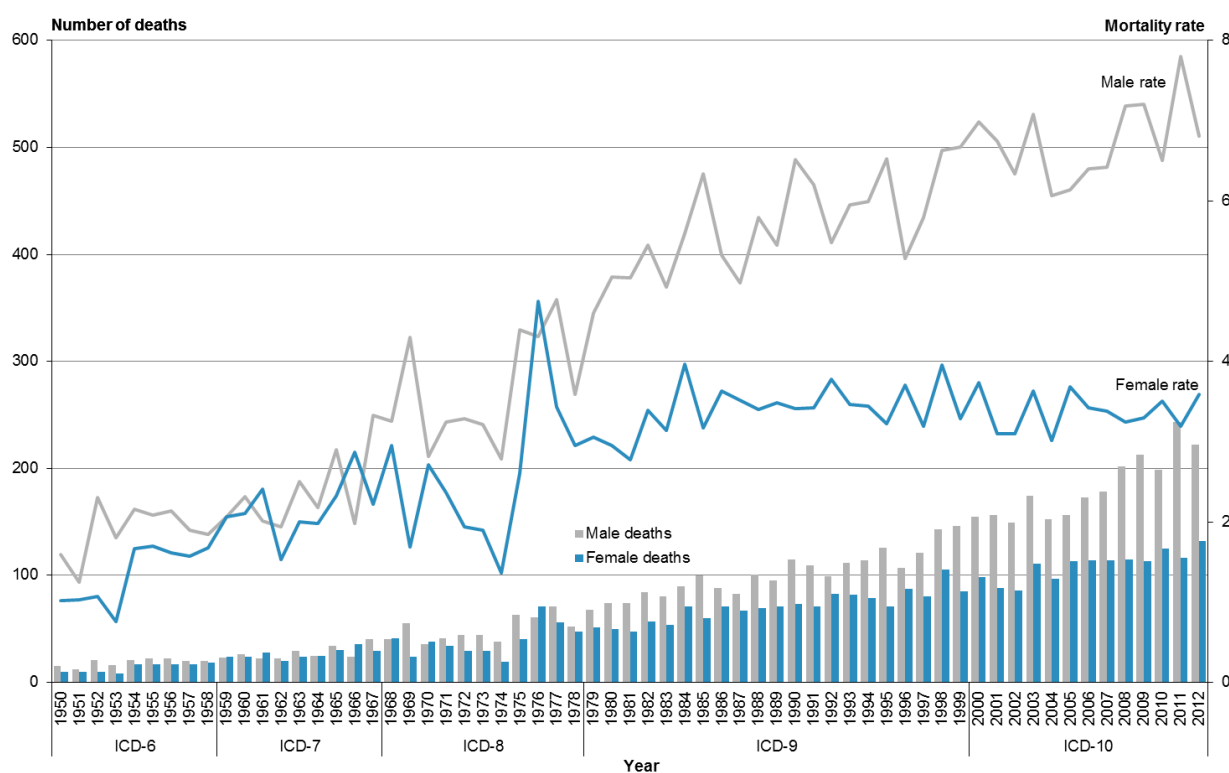
# Malignant melanoma of the skin

This section covers ICD code C43 (malignant melanoma of skin). Malignant melanoma of the skin was the fifth leading cause of cancer deaths for males and the seventh leading cause for females in 2012.

There were 354 deaths from malignant melanoma of the skin in 2012, representing 4.0% of total cancer deaths. Almost two-thirds of those who died from this condition (62.7%) were males.

Melanoma mortality rates increased for both males and females from 1950 to the late 1970s. From then on, male rates continued to increase, while female rates remained fairly stable, ranging from 2.8 to 4.0 deaths per 100,000. In 2012 the rate for males was almost twice the female rate (Figure 20).

**Figure 20: Number of deaths and mortality rates from malignant melanoma of the skin, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

From 1980 to 2012 the mortality rate from melanoma increased by 34.7% for males and 21.7% for females (Table 12). The number of male deaths from melanoma in 2012 was three times the number of deaths in 1980. For females, the number of deaths in 2012 was 2.6 times the number of deaths in 1980.

**Table 12: Number of deaths and mortality rates from malignant melanoma of the skin, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	74	5.1	50	2.9	124	3.9
1981	74	5.0	47	2.8	121	3.8
1982	84	5.5	57	3.4	141	4.3
1983	80	4.9	54	3.1	134	4.0
1984	90	5.6	71	4.0	161	4.7
1985	100	6.3	60	3.2	160	4.6
1986	88	5.3	71	3.6	159	4.4
1987	83	5.0	67	3.5	150	4.2
1988	101	5.8	69	3.4	170	4.5
1989	95	5.5	71	3.5	166	4.4
1990	115	6.5	73	3.4	188	4.9
1991	109	6.2	71	3.4	180	4.7
1992	99	5.5	83	3.8	182	4.5
1993	112	6.0	82	3.5	194	4.6
1994	114	6.0	79	3.4	193	4.6
1995	126	6.5	71	3.2	197	4.6
1996	107	5.3	87	3.7	194	4.4
1997	121	5.8	80	3.2	201	4.3
1998	143	6.6	105	4.0	248	5.2
1999	146	6.7	85	3.3	231	4.8
2000	155	7.0	98	3.7	253	5.2
2001	156	6.7	88	3.1	244	4.7
2002	149	6.3	86	3.1	235	4.6
2003	174	7.1	111	3.6	285	5.2
2004	152	6.1	97	3.0	249	4.4
2005	156	6.1	113	3.7	269	4.8
2006	173	6.4	114	3.4	287	4.7
2007	178	6.4	114	3.4	292	4.8
2008	202	7.2	115	3.2	317	5.1
2009	213	7.2	113	3.3	326	5.1
2010	199	6.5	125	3.5	324	4.9
2011	243	7.8	116	3.2	359	5.3
2012	222	6.8	132	3.6	354	5.1

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

Melanoma is uncommon among Māori. In 2012 there were three Māori deaths from melanoma of the skin, or 0.8 deaths per 100,000 Māori. Non-Māori had a mortality rate of 5.4 deaths per 100,000 in the same year.

**Table 13: Age distribution of deaths from malignant melanoma of the skin, percentages and rates, by ethnicity and sex, 2012**

Age group (years)	Percentage						Age-specific rate					
	Māori			Non-Māori			Māori			Non-Māori		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
<25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25–44	0.0	0.0	0.0	2.3	9.2	4.8	0.0	0.0	0.0	1.0	2.3	1.7
45–64	0.0	50.0	33.3	23.1	28.5	25.1	0.0	1.6	0.8	10.4	7.2	8.8
65+	100.0	50.0	66.7	74.7	62.3	70.1	6.4	5.4	5.8	62.3	26.0	42.6

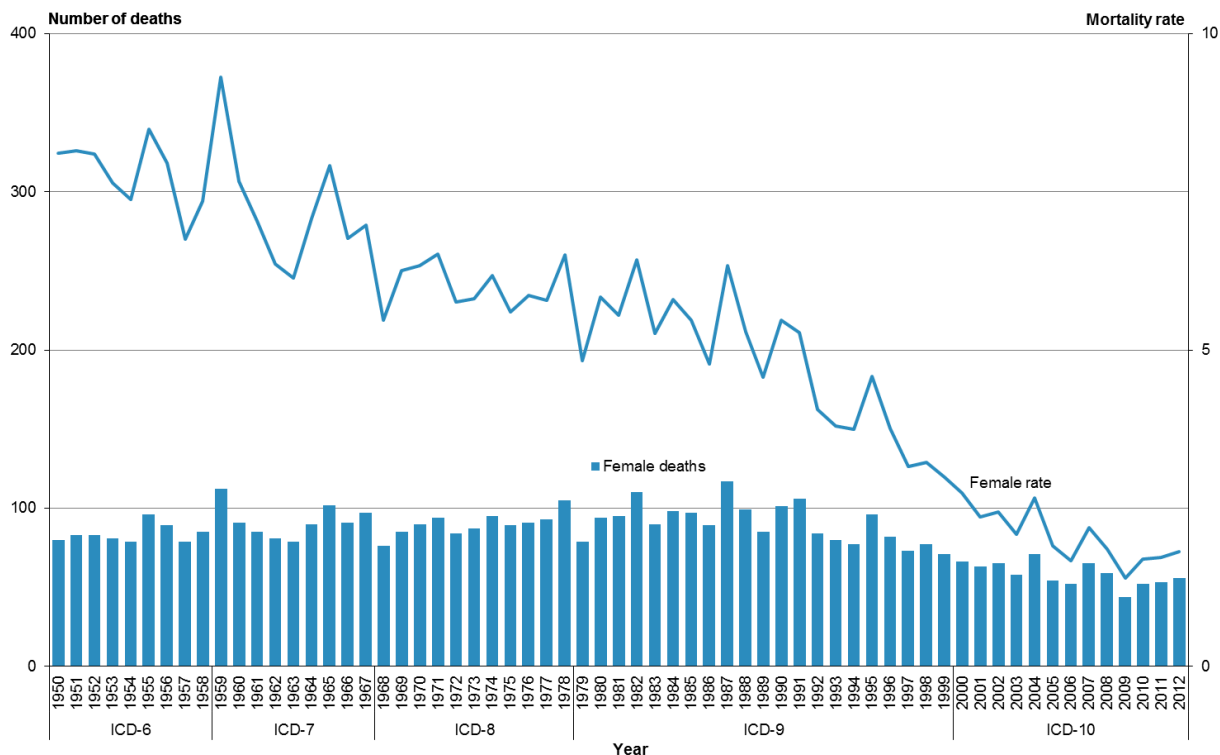
Note: rates per 100,000 population.

# Cervical cancer

This section covers ICD code C53 (malignant neoplasm of cervix uteri). There were 56 deaths from cervical cancer in 2012, accounting for 1.3% of total female cancer deaths.

From 1950 to 2012, the mortality rate from cervical cancer declined by almost 80% from 8.1 to 1.8 deaths per 100,000 females (Figure 21).

**Figure 21: Number of deaths and mortality rates from cervical cancer, 1950–2012**



Note: rates per 100,000 female population, age-standardised to WHO World Standard Population

Between 1980 and 2012, the number of women dying from cervical cancer decreased by 40.4% (Table 14). One factor in this decrease seen may have been the establishment of the National Cervical Screening Programme in 1991.<sup>8</sup>

**Table 14: Number of deaths and mortality rates from cervical cancer, 1980–2012**

Year	No.	Rate
1980	94	5.8
1981	95	5.5
1982	110	6.4
1983	90	5.3
1984	98	5.8
1985	97	5.5
1986	89	4.8
1987	117	6.3
1988	99	5.3
1989	85	4.6
1990	101	5.5
1991	106	5.3
1992	84	4.1
1993	80	3.8
1994	77	3.7
1995	96	4.6
1996	82	3.8
1997	73	3.2
1998	77	3.2
1999	71	3.0
2000	66	2.7
2001	63	2.4
2002	65	2.4
2003	58	2.1
2004	71	2.7
2005	54	1.9
2006	52	1.7
2007	65	2.2
2008	59	1.9
2009	44	1.4
2010	52	1.7
2011	53	1.7
2012	56	1.8

Note: rates per 100,000 female population, age-standardised to WHO World Standard Population.

<sup>8</sup> For further information on the National Cervical Screening Programme, see the National Screening Unit's website: [www.nsu.govt.nz](http://www.nsu.govt.nz)

In 2012, the majority (90.9%) of Māori deaths from cervical cancer were females under 65 years (Table 15). The corresponding proportion for non-Māori was 55.6%.

**Table 15: Age distribution of deaths from cervical cancer, percentages and rates, by ethnicity, 2012**

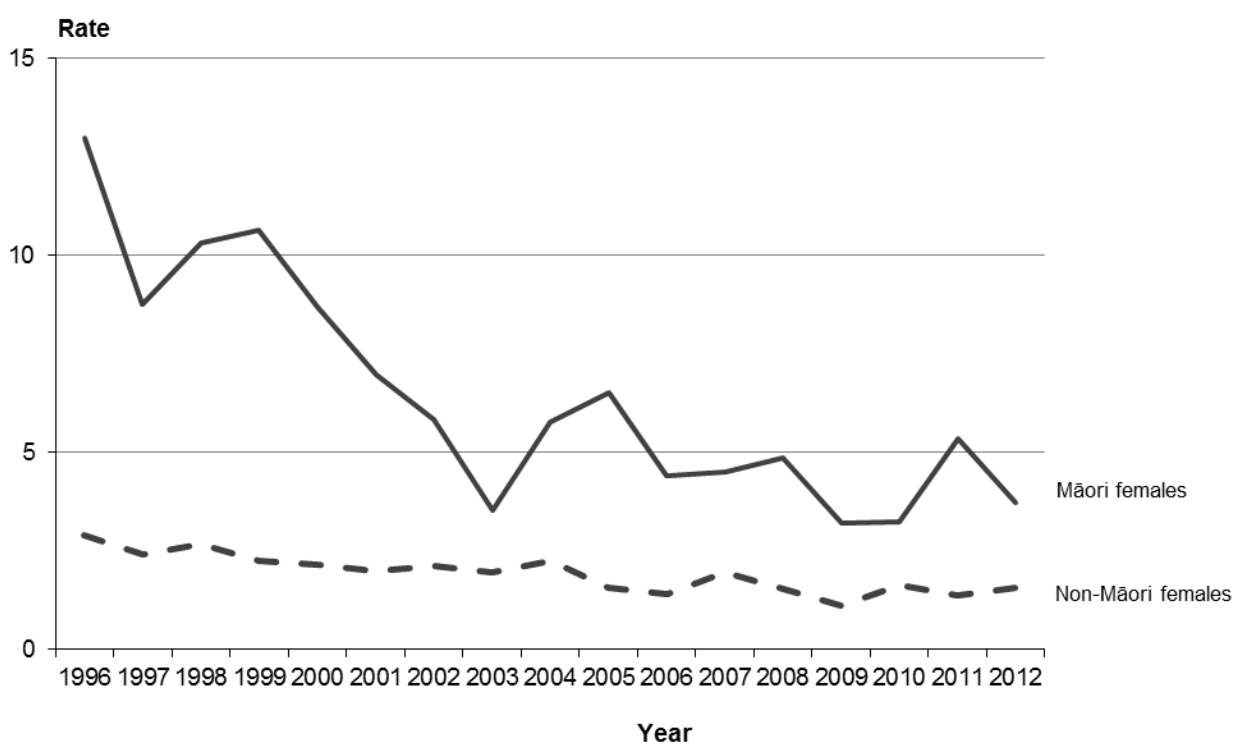
Age group (years)	Percentage		Age-specific rate	
	Māori female	Non-Māori female	Māori female	Non-Māori female
<25	0.0	0.0	0.0	0.0
25–44	27.3	17.8	3.4	1.6
45–64	63.6	37.8	11.1	3.3
65+	9.1	44.4	5.4	6.4

Note: rates per 100,000 female population.

Māori accounted for one-fifth (19.6%) of cervical cancer deaths in 2012. The mortality rate for Māori was 2.4 times the non-Māori rate: there were 3.7 deaths per 100,000 Māori females compared with 1.6 deaths per 100,000 non-Māori females.

There was a significant decrease in cervical cancer mortality rates for both Māori and non-Māori women between 1996 and 2012. The mortality rate for Māori decreased by 71.4% over this time, while the rate for non-Māori decreased by 46.0% (Figure 22). Note that the Māori numbers were low (eg, only 11 deaths in 2012).

**Figure 22: Mortality rates from cervical cancer, by ethnicity, 1996–2012**



Note: rates per 100,000 female population, age-standardised to WHO World Standard Population.



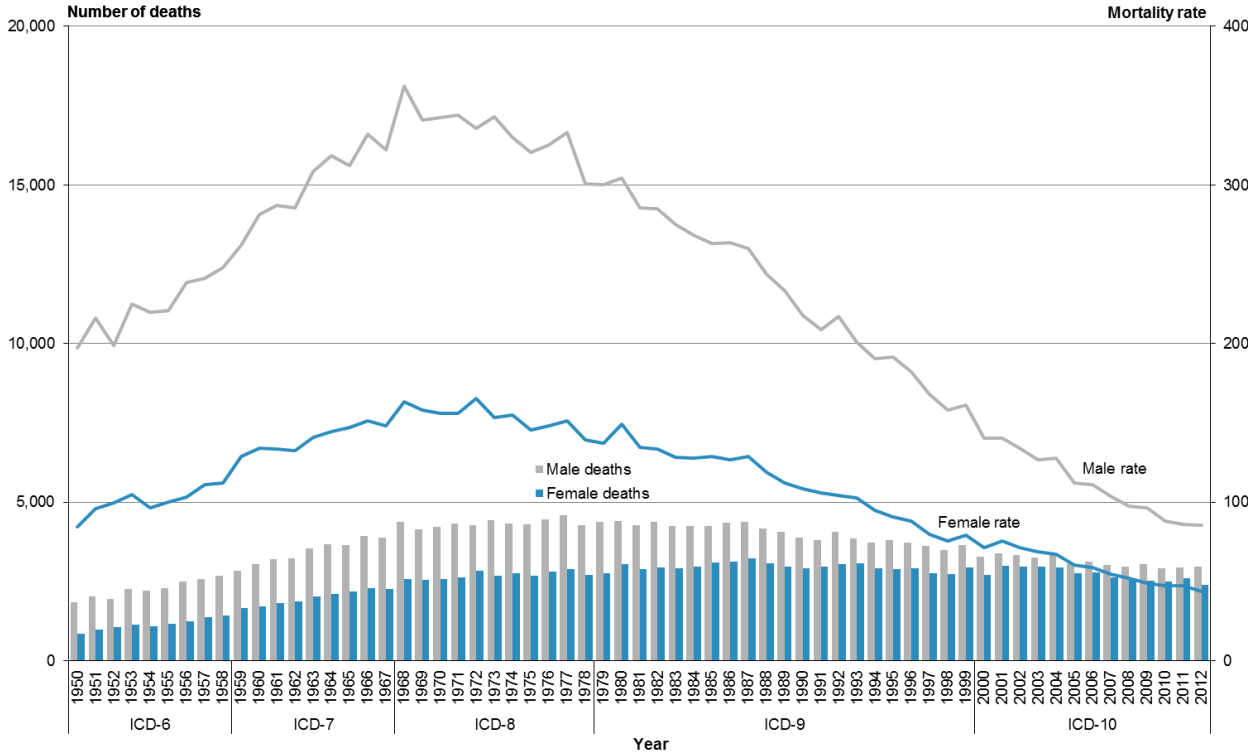
# Ischaemic heart disease

Ischaemic (or coronary) heart disease is a condition in which fatty deposits accumulate in the cells lining the wall of the coronary arteries – a process called atherosclerosis. The progressive narrowing and hardening of the arteries over time results in an inability to provide adequate oxygen to the heart muscle (called ischaemia). This can cause damage to the heart muscle or, in more severe cases, lead to myocardial infarction (a heart attack). This section covers ICD codes I20–I25.

Ischaemic heart disease was the second leading cause of death after cancer in 2012, accounting for 5339 deaths (17.6% of all deaths). Males accounted for 55.3% of these deaths.

Mortality rates from ischaemic heart disease for males and females in 2012 were the lowest they have been since 1950 (Figure 23). From 1950, males consistently had a higher mortality rate than females, although this gap became less marked after its peak in the late 1960s and early 1970s.

**Figure 23: Number of deaths and mortality rates from ischaemic heart disease, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

From 1980 to 2012 the mortality rate from ischaemic heart disease declined by 71.0% (Table 16). The male mortality rate was consistently higher than the female rate over this time: it was approximately twice the equivalent female rate for most of the period. In 2012 the male rate was 1.9 times the female rate.

**Table 16: Number of deaths and mortality rates from ischaemic heart disease, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	4413	304.4	3046	149.2	7459	217.4
1981	4259	285.3	2883	134.7	7142	201.6
1982	4362	285.0	2939	133.6	7301	200.9
1983	4241	274.8	2904	128.3	7145	192.6
1984	4245	268.2	2951	127.5	7196	189.6
1985	4234	262.9	3106	128.8	7340	188.8
1986	4346	263.4	3109	126.6	7455	187.4
1987	4379	260.1	3235	128.7	7614	187.8
1988	4173	243.4	3079	118.8	7252	174.9
1989	4071	233.4	2964	111.9	7035	166.3
1990	3884	217.5	2923	108.4	6807	157.3
1991	3789	208.6	2954	105.8	6743	151.7
1992	4064	217.3	3034	104.0	7098	155.1
1993	3842	201.0	3056	102.7	6898	146.7
1994	3718	190.5	2901	94.9	6619	137.2
1995	3810	191.2	2887	90.8	6697	135.9
1996	3729	182.0	2904	87.8	6633	130.1
1997	3614	168.0	2755	79.9	6369	119.4
1998	3479	158.1	2724	75.3	6203	112.3
1999	3646	160.9	2925	79.2	6571	115.6
2000	3269	140.3	2704	71.2	5973	102.2
2001	3389	140.2	2982	75.2	6371	104.1
2002	3333	134.2	2954	71.4	6287	99.8
2003	3243	126.7	2953	68.4	6196	94.9
2004	3366	127.6	2947	67.0	6313	94.4
2005	3057	111.8	2750	60.5	5807	83.9
2006	3133	110.9	2779	58.6	5912	82.5
2007	3015	103.4	2619	54.4	5634	77.2
2008	2960	97.4	2594	51.9	5554	72.9
2009	3039	96.6	2514	48.6	5553	70.7
2010	2900	88.0	2489	47.5	5389	66.3
2011	2934	85.9	2600	47.3	5534	65.4
2012	2952	85.2	2387	43.8	5339	63.0

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

In 2012, the mortality rate from ischaemic heart disease for Māori was 106.2 deaths per 100,000. The rate for non-Māori was 58.0 deaths per 100,000.

In 2012, the majority of ischaemic heart disease deaths occurred in the 65 years and over age group (which accounted for 81.3% of male deaths and 93.9% of female deaths from this condition). Māori deaths from ischaemic heart disease tended to occur at a younger age than non-Māori: 40.2% of Māori deaths from this condition occurred in those aged under 65 years, compared to 10.5% of non-Māori deaths (Table 17).

**Table 17: Age distribution of deaths from ischaemic heart disease, percentages and rates, by ethnicity and sex, 2012**

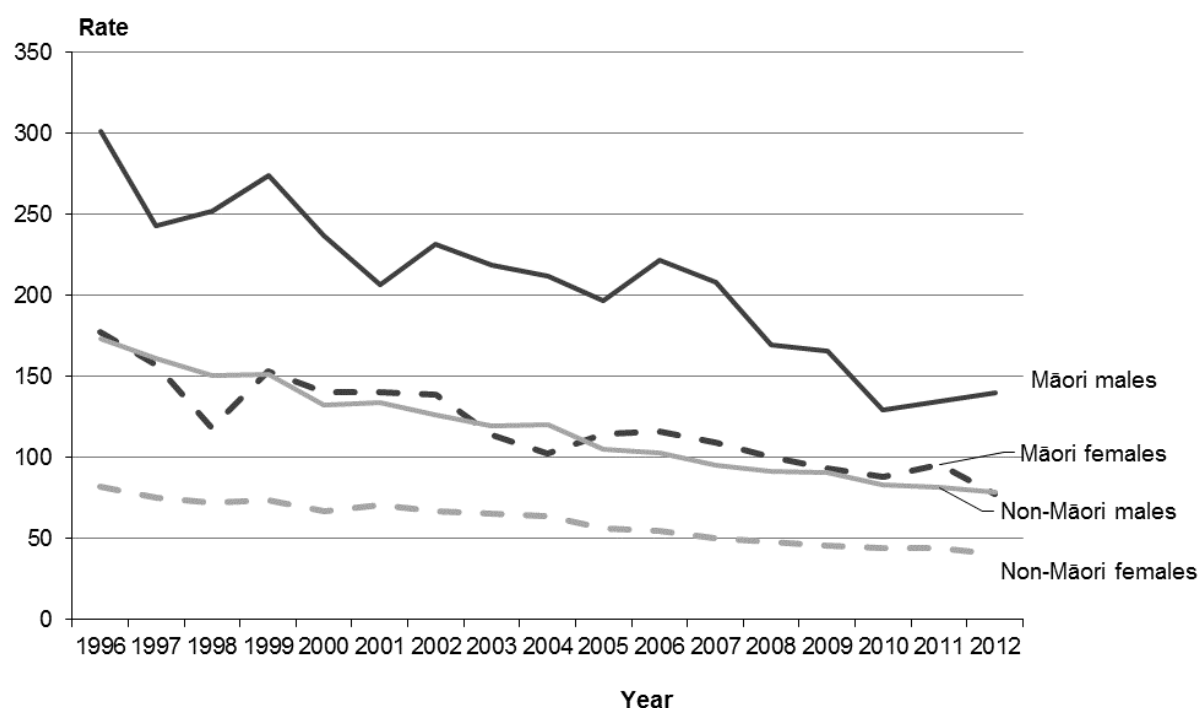
Age group (years)	Percentage						Age-specific rate					
	Māori			Non-Māori			Māori			Non-Māori		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
<25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
25–44	4.2	1.7	3.2	1.2	0.5	0.9	15.2	3.4	8.9	6.8	2.1	4.4
45–64	41.1	30.3	37.0	14.6	3.4	9.5	209.3	85.5	143.9	79.6	14.8	46.5
65+	54.7	68.0	59.8	84.2	96.0	89.5	1003.2	653.0	812.9	846.3	679.7	756.2

Note: rates per 100,000 population.

Of the four groups represented in Figure 24, the Māori male population had the highest rate of ischaemic heart disease deaths in 2012. This rate was 1.8 times the rate for non-Māori males. The rate for Māori females was 1.9 times the rate for non-Māori females.

Between 1996 and 2012, the rate for Māori males was consistently higher than rates for all other groups shown in Figure 24. The rate for Māori males was also the only rate that increased between 2011 and 2012.

**Figure 24: Mortality rates from ischaemic heart disease, by sex and ethnicity, 1996–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

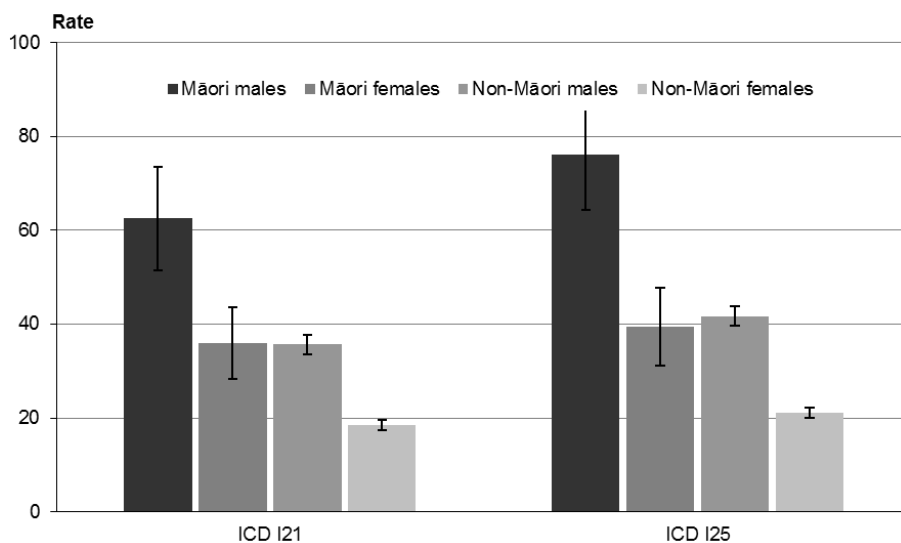
The five conditions that make up the ischaemic heart disease ICD classification grouping for mortality coding are:

- I20 angina pectoris
- I21 acute myocardial infarction
- I22 subsequent myocardial infarction
- I24 other acute ischaemic heart diseases
- I25 chronic ischaemic heart disease.

Of these conditions, acute myocardial infarction (I21) and chronic ischaemic heart disease (I25) together account for the majority of the ischaemic heart disease deaths reported for 2012 (98.7%). Chronic ischaemic heart disease alone was responsible for 53.7%.

Figure 25 compares age-standardised mortality rates, by ethnicity and sex, from acute myocardial infarction and chronic ischaemic heart disease in 2012. The figure suggests the pattern of mortality incidence for these two conditions is generally similar. Males had a higher age-standardised mortality rate (within the ethnic groups) for both conditions.

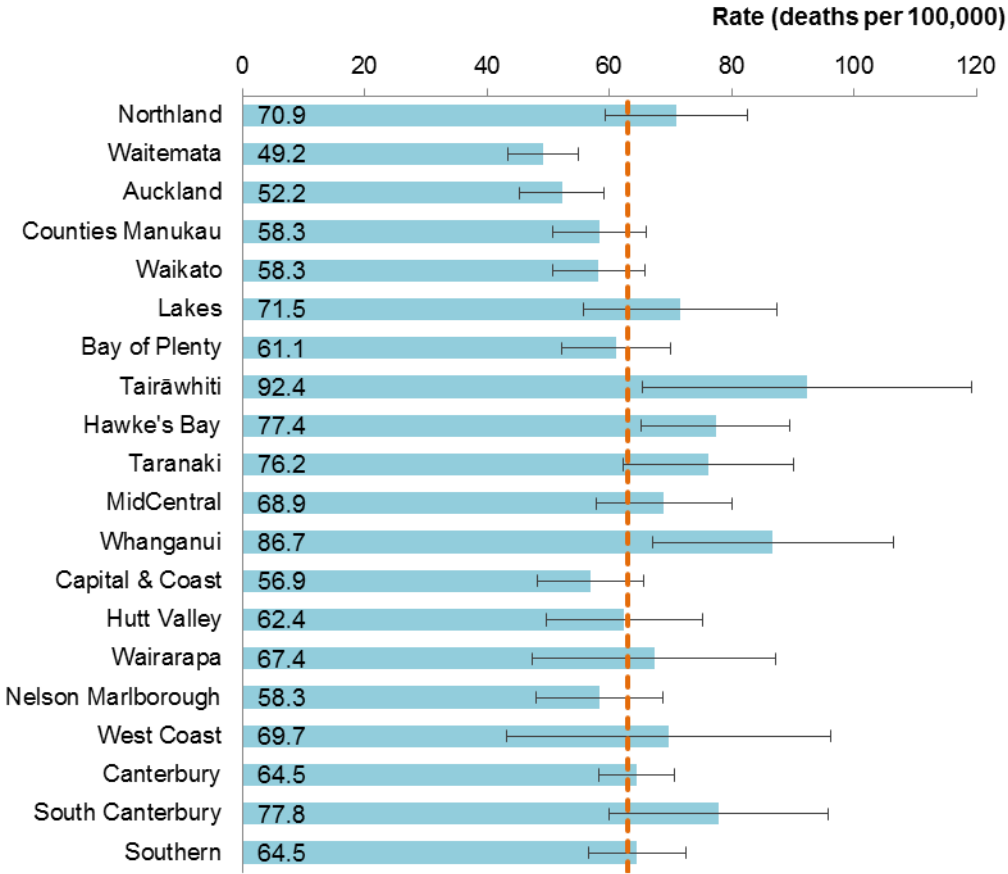
**Figure 25: Mortality rates from acute myocardial infarction (ICD I21) and chronic ischaemic heart disease (ICD I25), by sex and ethnicity, 2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population; 95% confidence intervals.

Three DHB regions (Tairāwhiti, Whanganui and Hawke’s Bay) had an ischaemic heart disease death rate that was significantly higher than the national rate (Figure 26). Two DHBs had a rate that was significantly lower (Waitemata and Auckland).

**Figure 26: Mortality rates from ischaemic heart disease, by DHB region, total population, 2012**



**Notes:**

The dashed vertical line is the national rate.  
 Rates per 100,000 population, age-standardised to WHO World Standard Population;  
 99% confidence intervals.

# Cerebrovascular disease

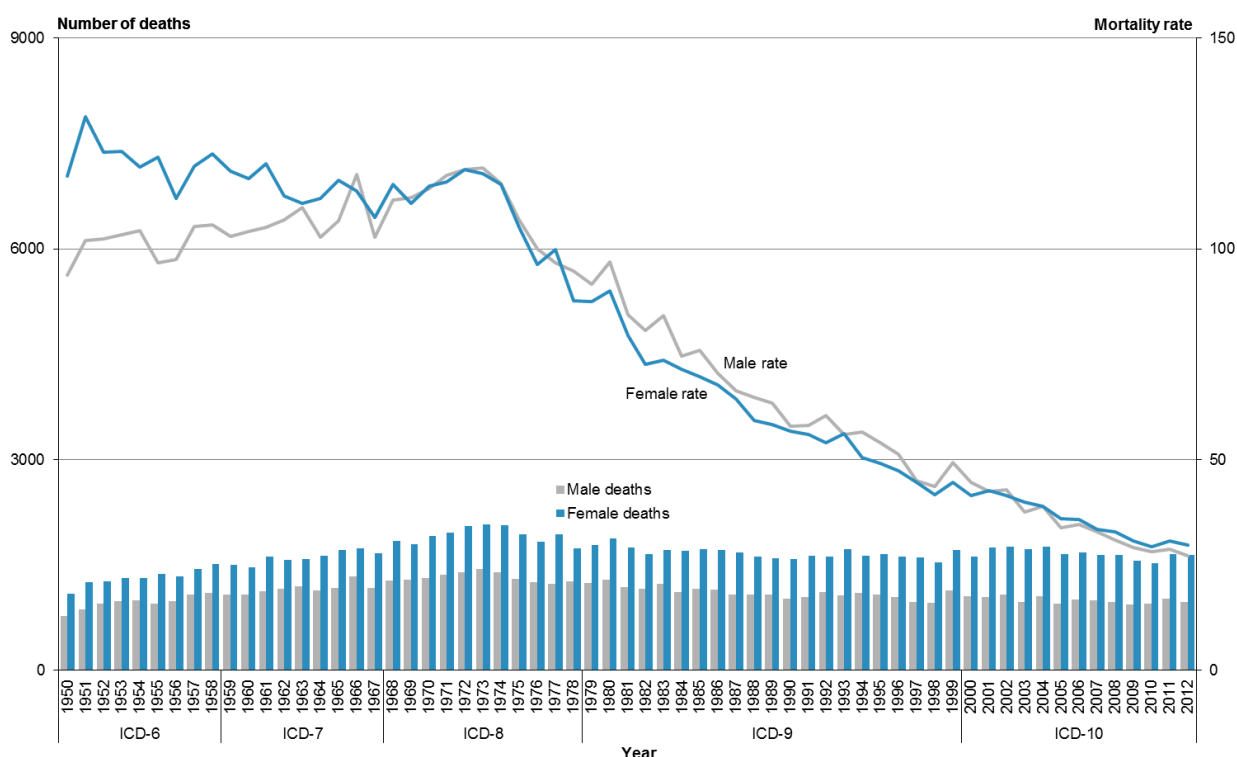
Cerebrovascular disease is a general term that encompasses a variety of diseases affecting the arteries that supply the brain. This condition is commonly associated with stroke (ie, the sudden death of brain cells due to lack of oxygen when the blood flow to part of the brain is impaired by blockage or rupture of an artery in the brain). A stroke is sometimes called a cerebrovascular accident. Risk factors associated with the narrowing of the arteries (atherosclerosis) that characterises cerebrovascular disease include high blood cholesterol level, high blood pressure, smoking, diabetes and a family history of atherosclerotic disease. Atherosclerosis also occurs with ageing. This section covers ICD codes I60–I69.

Cerebrovascular disease was the third leading cause of death in the total population in 2012, after cancer and ischaemic heart disease.

There were 2612 deaths from cerebrovascular disease in 2012, the majority of which (62.9%) were females.

For each year between 1950 and 2012 there were more female deaths from cerebrovascular disease compared to males (Figure 27). Mortality rates from cerebrovascular disease were similar, and sharply declined for both males and females from the early 1970s to 2012.

**Figure 27: Number of deaths and mortality rates from cerebrovascular disease, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

In 2012 the mortality rate from cerebrovascular disease for males was 72.0% lower than it was in 1980, and the rate for females was 67.1% lower (Table 18). Males and females had similar annual mortality rates over this period.

**Table 18: Number of deaths and mortality rates from cerebrovascular disease, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	1288	96.8	1870	90.0	3158	92.8
1981	1175	84.4	1745	79.4	2920	82.3
1982	1155	80.7	1651	72.6	2806	76.6
1983	1229	84.1	1708	73.5	2937	78.2
1984	1108	74.5	1703	71.4	2811	73.0
1985	1160	76.0	1723	69.7	2883	72.9
1986	1145	70.5	1710	67.7	2855	69.8
1987	1076	66.3	1675	64.4	2751	65.8
1988	1077	64.8	1616	59.2	2693	62.5
1989	1072	63.3	1597	58.3	2669	60.8
1990	1021	57.9	1579	56.6	2600	57.9
1991	1036	58.1	1624	56.0	2660	57.6
1992	1113	60.5	1621	54.0	2734	56.8
1993	1061	55.9	1727	56.0	2788	56.4
1994	1096	56.6	1631	50.4	2727	53.4
1995	1070	53.9	1645	49.0	2715	51.5
1996	1045	51.3	1614	47.2	2659	49.1
1997	966	44.9	1600	44.5	2566	45.1
1998	960	43.5	1532	41.6	2492	42.7
1999	1129	49.3	1706	44.5	2835	47.0
2000	1048	44.6	1620	41.4	2668	42.9
2001	1036	42.4	1748	42.7	2784	43.1
2002	1078	42.7	1751	41.3	2829	42.3
2003	969	37.4	1723	39.8	2692	39.3
2004	1050	38.8	1756	38.9	2806	39.4
2005	940	33.7	1647	36.0	2587	35.5
2006	1000	34.6	1673	35.8	2673	35.8
2007	987	32.9	1638	33.4	2625	33.7
2008	970	30.9	1641	32.9	2611	32.4
2009	937	29.0	1551	30.7	2488	30.4
2010	945	28.1	1522	29.2	2467	29.1
2011	1012	28.7	1653	30.6	2665	30.2
2012	969	27.1	1643	29.6	2612	29.0

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

Among non-Māori, 94.0% of deaths from cerebrovascular disease occurred in those aged 65 years and over in 2012 (Table 19). Among Māori, a greater proportion of deaths occurred in younger age groups; 34.4% of Māori deaths from this condition occurred below the age of 65. The equivalent figure for non-Māori was 6.0%.

**Table 19: Age distribution of deaths from cerebrovascular disease, percentages and rates, by ethnicity and sex, 2012**

Age group (years)	Percentage						Age-specific rate					
	Māori			Non-Māori			Māori			Non-Māori		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
<25	1.7	1.4	1.5	0.0	0.0	0.0	0.5	0.6	0.6	0.0	0.0	0.0
25–44	3.4	6.9	5.3	1.2	0.9	1.0	2.5	5.6	4.2	2.3	2.7	2.5
45–64	37.3	19.4	27.5	7.5	3.5	5.0	39.0	22.2	30.1	13.9	10.7	12.3
65+	57.6	72.2	65.6	91.3	95.6	94.0	217.3	280.6	251.5	313.5	481.3	404.3

Note: rates per 100,000 population.

In 2012, Māori had a mortality rate from cerebrovascular disease of 31.2 deaths per 100,000. The mortality rate for non-Māori was 27.7 deaths per 100,000.

Of the four population groups shown in Figure 28, Māori females had the highest age-standardised mortality rate for cerebrovascular disease in 2012, followed by Māori males. From 1996 to 2012, the rate for all groups decreased. In particular, the rate for Māori males and non-Māori males declined by 49%. The disparity between Māori and non-Māori rates appears to be narrowing over time.

**Figure 28: Number of deaths and mortality rates from cerebrovascular disease, by sex and ethnicity, 1996–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.



The seven codes that make up the cerebrovascular disease ICD classification grouping for mortality coding are:

- I60 subarachnoid haemorrhage
- I61 intracerebral haemorrhage
- I62 other non-traumatic intracranial haemorrhage
- I63 cerebral infarction
- I64 stroke, not specified as haemorrhage or infarction
- I67 other cerebrovascular diseases
- I69 sequelae<sup>9</sup> of cerebrovascular disease.

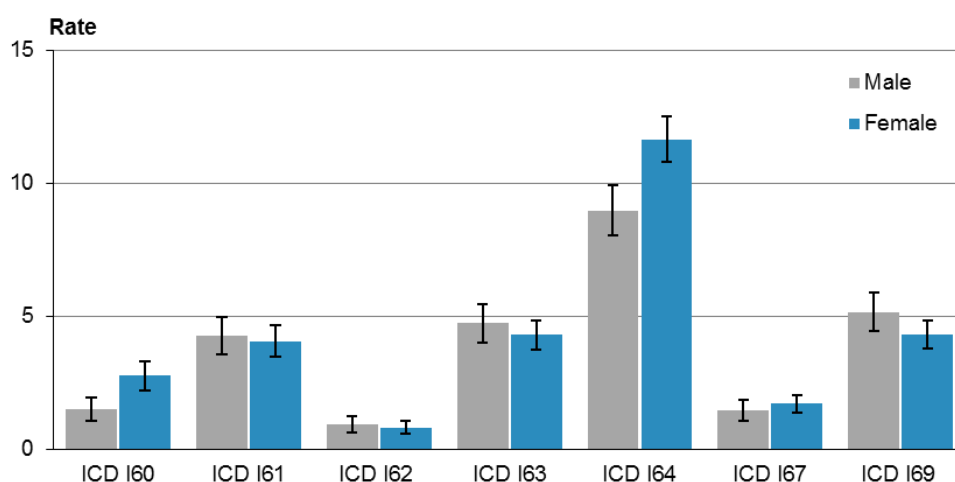
'Stroke, not specified as haemorrhage or infarction' (I64) accounted for 40.4% of cerebrovascular disease-related mortality in 2012. The three other major causes of cerebrovascular disease-related mortality in 2012 were:

- I69 sequelae of cerebrovascular disease (17.3%)
- I63 cerebral infarction (15.2%)
- I61 intracerebral haemorrhage (12.6%).

Together, these four conditions accounted for the majority (85.5%) of mortality from cerebrovascular disease in 2012.

Females had significantly higher rates of mortality from stroke (I64) and subarachnoid haemorrhage (I60) in 2012 (Figure 29).

**Figure 29: Mortality rates from cerebrovascular disease, by specific disease classification and sex, 2012**

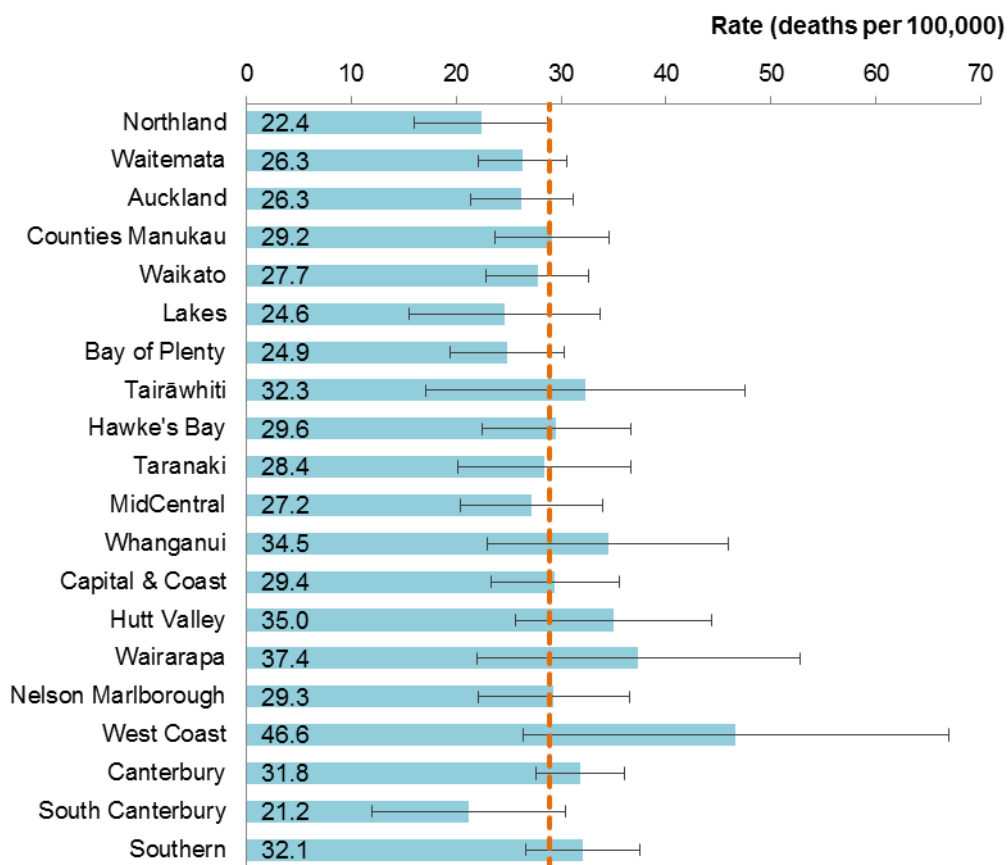


Note: rates per 100,000 population, age-standardised to WHO World Standard Population; 95% confidence intervals.

<sup>9</sup> The term 'sequelae' refers to conditions that follow as a consequence of a disease.

Figure 30 shows cerebrovascular disease mortality rates by DHB region of residence for the total population in 2012. Northland DHB had a rate that was significantly lower than the national rate. All other DHB regions had rates that were not significantly different to the national rate.

**Figure 30: Mortality rates from cerebrovascular disease, by DHB region, total population, 2012**



Notes:

The dashed vertical line is the national rate.

Rates per 100,000 population, age-standardised to WHO World Standard Population; 99% confidence intervals.

# Diabetes mellitus

This section covers ICD codes E10–E14. Diabetes mellitus, commonly known as diabetes, is a chronic disease associated with abnormally high levels of glucose in the blood (hyperglycaemia). There are two main types of diabetes: Type 1 (insulin-dependent diabetes mellitus) and Type 2 (adult-onset diabetes). Type 2 diabetes is much more common than Type 1.

A person with Type 1 diabetes does not produce sufficient insulin – they might make only a little, or none at all. Type 1 diabetes usually starts in the teenage years or when puberty begins, although onset can occur later in life.

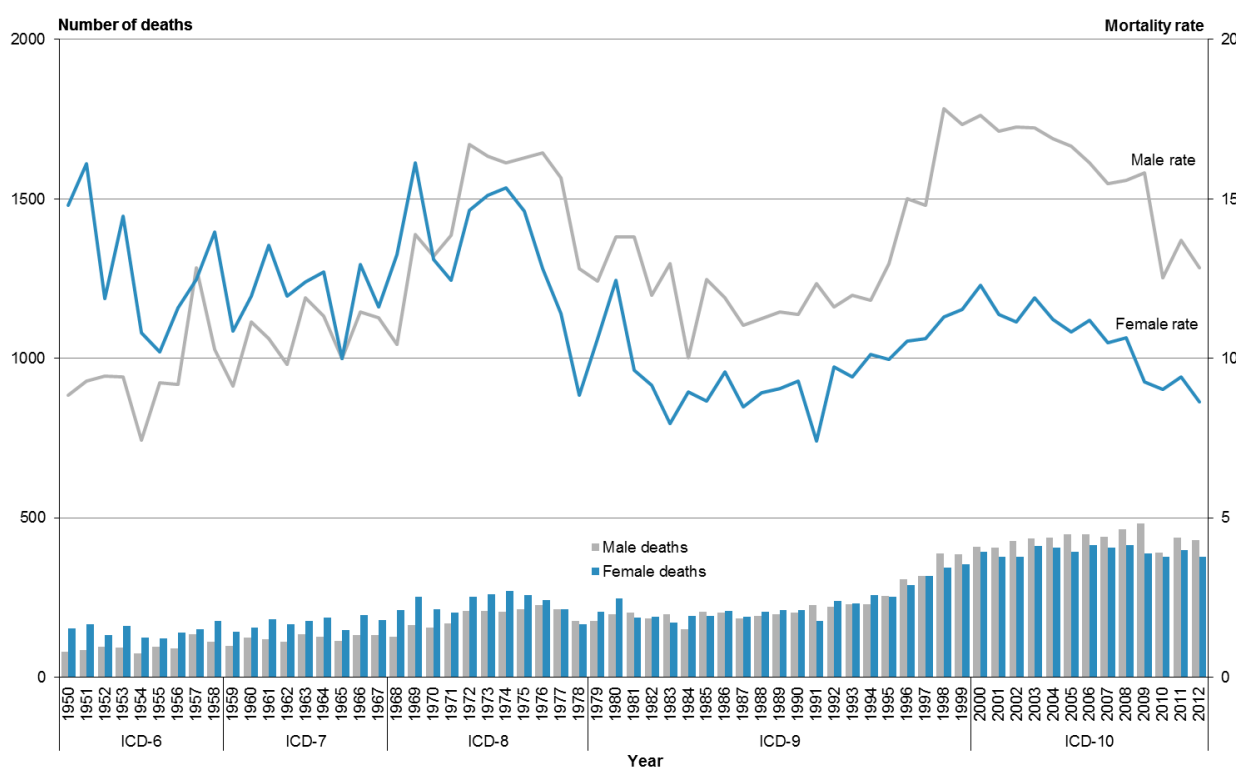
A person with Type 2 diabetes produces insulin, but the cells upon which the insulin should act are not sufficiently sensitive to its action. Type 2 diabetes commonly starts later in life (typically in people over 30 years of age). Common risk factors include: genetic predisposition (eg, ethnicity or a family history of Type 2 diabetes), obesity and lack of exercise. It is associated with lower socioeconomic status. People suffering from Type 2 diabetes can become insulin-dependent as the disease progresses.

Diabetes can lead to other health conditions, including kidney failure, eye disease, foot ulceration and heart disease.

There were 807 deaths from diabetes mellitus in 2012. Males accounted for 53.3% of these.

From 1950 to the late 1960s the mortality rate from diabetes mellitus for males was generally lower than that for females (Figure 31). From 1970 to 2012 the male rate was consistently higher than the female rate. In 2012 the male rate was 1.5 times the female rate.

**Figure 31: Number of deaths and mortality rates from diabetes mellitus, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

While the total number of deaths from diabetes mellitus peaked in 2008, the mortality rate has generally been declining since 2000 (Table 20). In 2012, the mortality rate for females was 8.6 deaths per 100,000, and for males it was 12.8 deaths per 100,000.

**Table 20: Number of deaths and mortality rates from diabetes mellitus, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	198	13.8	248	12.4	446	13.1
1981	201	13.8	187	9.6	388	11.2
1982	184	12.0	190	9.2	374	10.4
1983	197	13.0	172	8.0	369	10.1
1984	149	10.0	192	8.9	341	9.2
1985	204	12.5	193	8.7	397	10.3
1986	202	11.9	207	9.6	409	10.5
1987	184	11.0	189	8.5	373	9.6
1988	192	11.3	205	8.9	397	10.0
1989	196	11.5	209	9.0	405	10.0
1990	203	11.4	211	9.3	414	10.1
1991	226	12.3	177	7.4	403	9.6
1992	220	11.6	238	9.7	458	10.5
1993	228	12.0	231	9.4	459	10.6
1994	228	11.8	258	10.1	486	10.7
1995	255	13.0	253	10.0	508	11.2
1996	306	15.0	289	10.5	595	12.4
1997	316	14.8	317	10.6	633	12.5
1998	387	17.8	343	11.3	730	14.2
1999	385	17.3	355	11.5	740	14.1
2000	408	17.6	394	12.3	802	14.6
2001	405	17.1	377	11.4	782	13.9
2002	427	17.2	378	11.1	805	13.8
2003	436	17.2	411	11.9	847	14.3
2004	438	16.9	405	11.2	843	13.7
2005	447	16.7	392	10.8	839	13.4
2006	447	16.1	413	11.2	860	13.4
2007	440	15.5	407	10.5	847	12.9
2008	463	15.6	414	10.6	877	12.9
2009	482	15.8	387	9.3	869	12.3
2010	391	12.5	377	9.0	768	10.7
2011	438	13.7	397	9.4	835	11.5
2012	430	12.8	377	8.6	807	10.6

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

Diabetes mortality in 2012 was largely confined to those aged 45 years and older. Only a small proportion of deaths occurred below this age (Table 21). Within the Māori population, a greater proportion of deaths from diabetes occurred in the 45–64-year age group than in the equivalent age group within the non-Māori population (41.6% of deaths occurred in this age group for Māori compared to 13.7% for non-Māori).

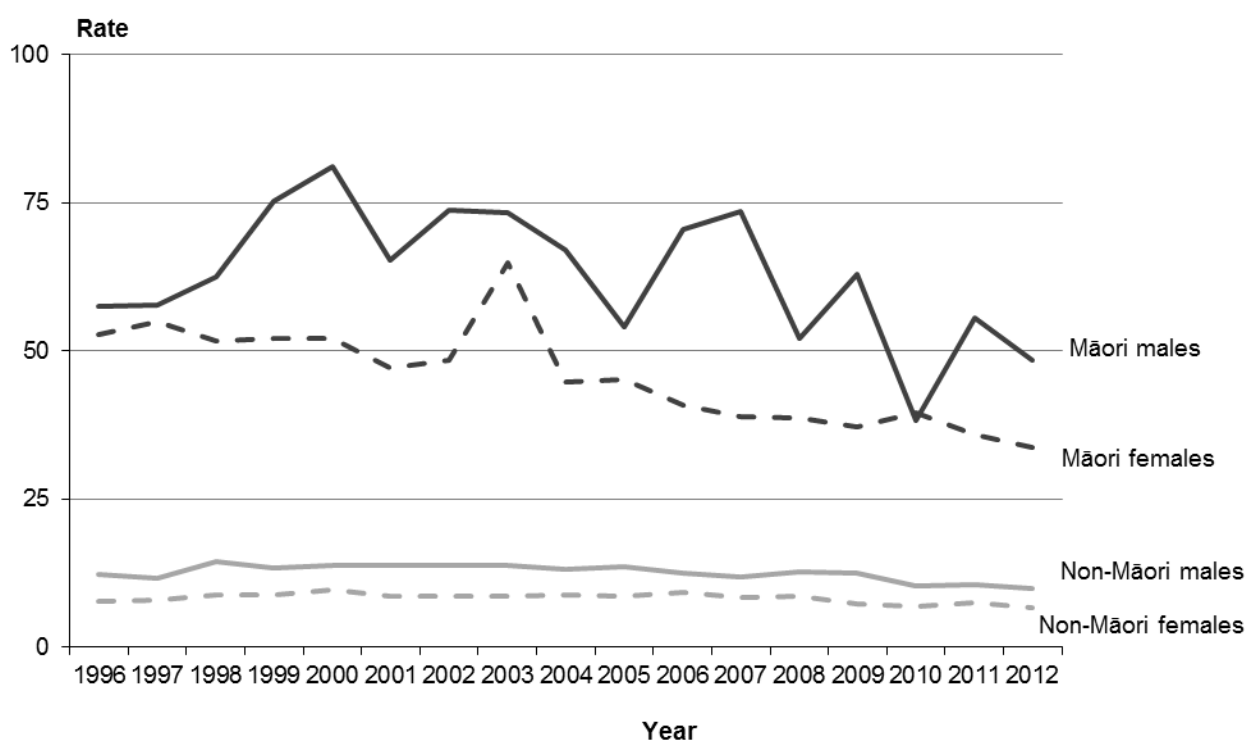
**Table 21: Age distribution of deaths from diabetes mellitus, percentages and rates, by ethnicity and sex, 2012**

Age group (years)	Percentage						Age-specific rate					
	Māori			Non-Māori			Māori			Non-Māori		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
<25	0.0	0.0	0.0	0.6	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.2
25–44	2.9	2.4	2.7	0.6	1.4	1.0	3.8	2.2	3.0	0.4	0.8	0.6
45–64	43.7	39.0	41.6	16.2	10.8	13.7	79.8	50.7	64.4	10.8	6.3	8.5
65+	53.4	58.5	55.7	82.6	87.8	85.0	351.4	259.0	301.2	101.9	83.0	91.7

Note: rates per 100,000 population.

Of the four population groups represented in Figure 32, Māori males had the highest age-standardised mortality rate for diabetes mellitus, followed by Māori females. The age-standardised rate for Māori was five times the rate for non-Māori in 2012 (Māori had a mortality rate of 40.6 deaths per 100,000, compared with 8.1 deaths per 100,000 non-Māori).

**Figure 32: Mortality rates from diabetes mellitus, by sex and ethnicity, 1996–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

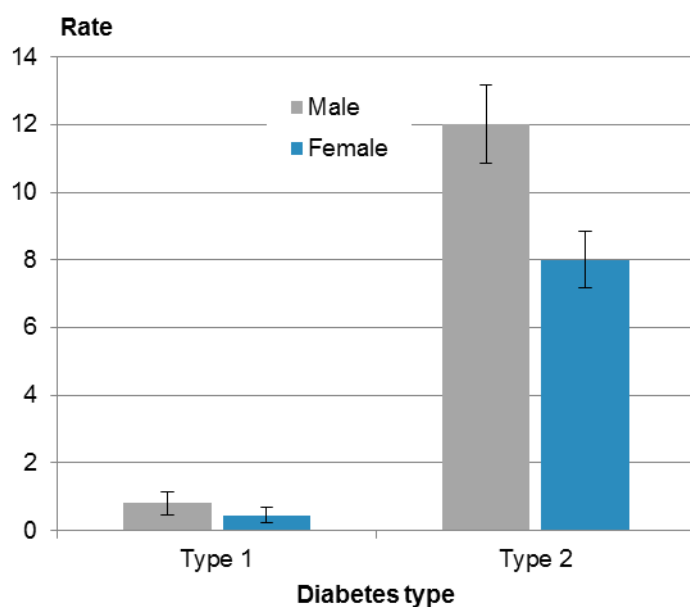
The four codes that make up the diabetes mellitus ICD classification grouping are:

- E10 Type 1 diabetes mellitus
- E11 Type 2 diabetes mellitus
- E13 other specified diabetes mellitus
- E14 unspecified diabetes mellitus.

Type 2 diabetes mellitus (E11) accounted for the majority (94.5%) of diabetes mortality in 2012. Very few deaths (7) were classified as unspecified diabetes mellitus (E14). There were no deaths classified as other specified diabetes mellitus (E13) in 2012.

Figure 33 shows mortality rates for Type 1 (E10) and Type 2 (E11) diabetes mellitus by sex in 2012. Males had a significantly higher rate of Type 2 diabetes mortality than females.

**Figure 33: Mortality rates from diabetes mellitus, by diabetes type and sex, 2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population; 95% confidence intervals.

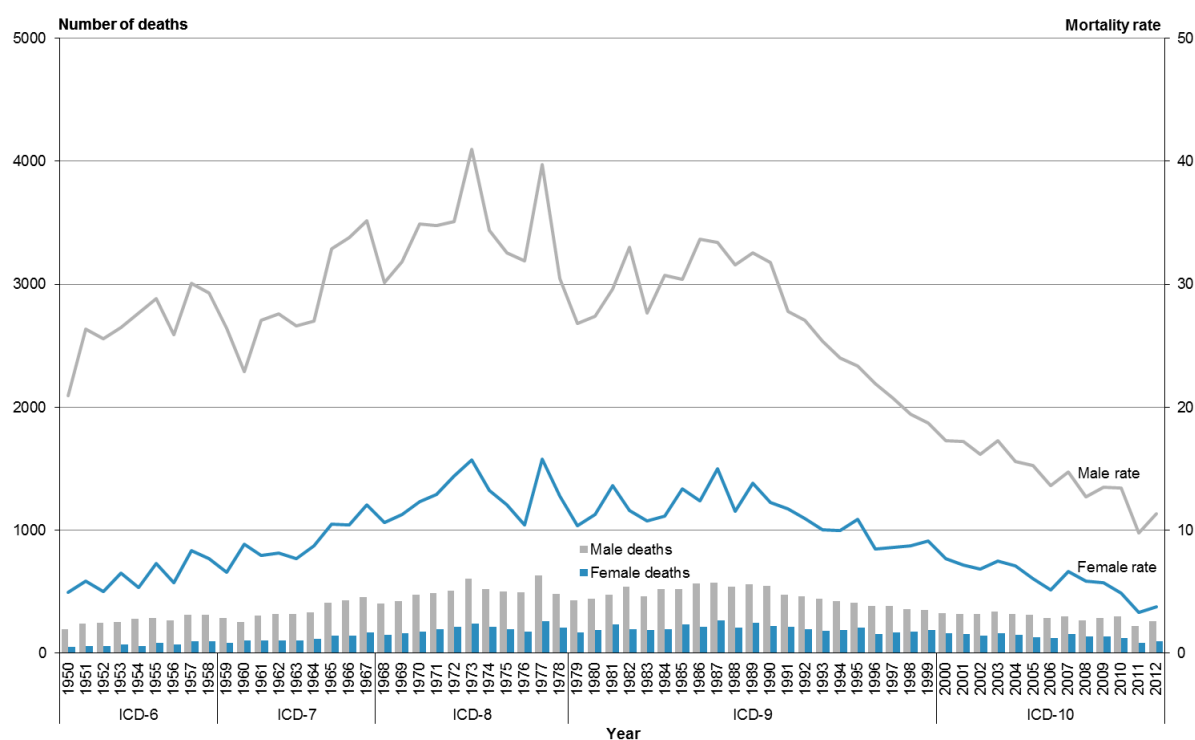
# Motor vehicle accidents

The classification ‘motor vehicle accidents’ primarily covers accidents associated with motorised transport (both on-road and off-road), including cars, two- or three-wheeler vehicles and heavy transport vehicles. It also includes pedestrians or cyclists involved in accidents with motor vehicles. The classification excludes road traffic accidents that did not include some form of motorised transport; for example, a collision between a pedestrian and a pedal cyclist, or a collision between a pedal cyclist and a railway train. It also excludes accidents involving watercraft and aircraft. The ICD codes from the V02–V89 range discussed here therefore exclude those that do not meet these criteria.

Motor vehicle accidents are a major cause of mortality in New Zealand and other industrialised countries. The first recorded motor vehicle accident fatality in New Zealand was in Christchurch in 1908. For most of the 20th century, the motor vehicle accident rate rose in concert with the increasing number of vehicles on New Zealand roads. Since the late 1980s this trend has reversed, and there has been a steady decline in deaths from motor vehicle accidents. This decline may be related to a variety of factors, including a greater societal awareness of the dangers of drink driving, excessive speed and driver fatigue; a rise in seatbelt use; better trauma treatment; and the increasing safety of roads and modern motor vehicles. The open road speed limit in New Zealand has varied over the years from 80 km/h (set in 1948 and again in 1974) to 100 km/h (the current limit, set in 1985). Blood alcohol and breath testing procedures were introduced in New Zealand in 1969, and seatbelt use became compulsory in 1975. Speed cameras were introduced in 1993.

Mortality rates from motor vehicle accidents peaked in the 1970s and generally declined from this point forward (Figure 34). In 2011 mortality rates were the lowest of all years shown for both sexes (9.8 deaths per 100,000 for males and 3.3 deaths per 100,000 for females). In 2012 the mortality rate was 11.3 deaths per 100,000 for males and 3.7 per 100,000 for females.

**Figure 34: Number of deaths and mortality rates from motor vehicle accidents, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

From 1980 to 2012 the rate of motor vehicle accident deaths declined by around two-thirds (58.7% among males and 66.8% among females) (Table 22). Males had a consistently higher rate of motor vehicle accident deaths over this time; in 2012 the male rate was three times the female rate.

**Table 22: Number of deaths and mortality rates from motor vehicle accidents, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	438	27.4	184	11.3	622	19.3
1981	476	29.6	231	13.6	707	21.6
1982	538	33.0	192	11.6	730	22.2
1983	461	27.6	186	10.8	647	19.2
1984	517	30.8	193	11.1	710	21.0
1985	516	30.4	231	13.4	747	21.8
1986	567	33.7	215	12.4	782	23.0
1987	570	33.4	265	15.0	835	24.2
1988	537	31.6	206	11.5	743	21.5
1989	557	32.5	242	13.8	799	23.1
1990	545	31.7	219	12.2	764	22.0
1991	471	27.8	210	11.7	681	19.7
1992	462	27.1	194	10.9	656	18.8
1993	438	25.3	179	10.0	617	17.6
1994	419	24.0	183	10.0	602	16.9
1995	407	23.4	205	10.9	612	17.1
1996	381	21.9	156	8.5	537	15.1
1997	383	20.8	167	8.6	550	14.5
1998	358	19.4	171	8.7	529	14.0
1999	349	18.7	184	9.1	533	13.8
2000	322	17.3	157	7.7	479	12.5
2001	318	17.2	151	7.2	469	12.1
2002	314	16.2	142	6.8	456	11.4
2003	336	17.2	158	7.4	494	12.3
2004	314	15.6	149	7.1	463	11.2
2005	307	15.2	127	6.0	434	10.6
2006	283	13.6	120	5.1	403	9.2
2007	300	14.7	150	6.6	450	10.6
2008	261	12.7	135	5.8	396	9.2
2009	286	13.5	134	5.7	420	9.5
2010	296	13.4	120	4.9	416	9.1
2011	221	9.8	84	3.3	305	6.5
2012	255	11.3	92	3.7	347	7.4

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.



Motor vehicle accident deaths within the Māori population were more common in the younger age groups in 2012 (Table 23). More than two-thirds of Māori deaths (69.3%) occurred in those below the age of 45, compared to 51.0% of non-Māori deaths.

Māori had higher age-specific rates of motor vehicle accident deaths than non-Māori in all age groups. Māori aged 25–44 and 45–64 years had mortality rates that were approximately three times higher than the corresponding non-Māori rates in 2012.

**Table 23: Age distribution of deaths from motor vehicle accidents, percentages and rates, by ethnicity and sex, 2012**

Age group (years)	Percentage						Age-specific rate					
	Māori			Non-Māori			Māori			Non-Māori		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
<25	33.8	25.0	31.8	27.3	25.0	26.6	12.5	2.8	7.8	8.4	3.2	5.9
25–44	32.4	55.0	37.5	27.8	15.3	24.3	27.9	12.3	19.7	10.7	2.1	6.3
45–64	25.0	10.0	21.6	20.9	20.8	20.8	30.2	3.2	15.9	8.0	2.9	5.4
65+	8.8	10.0	9.1	24.1	38.9	28.2	38.3	10.8	23.4	17.0	9.0	12.6

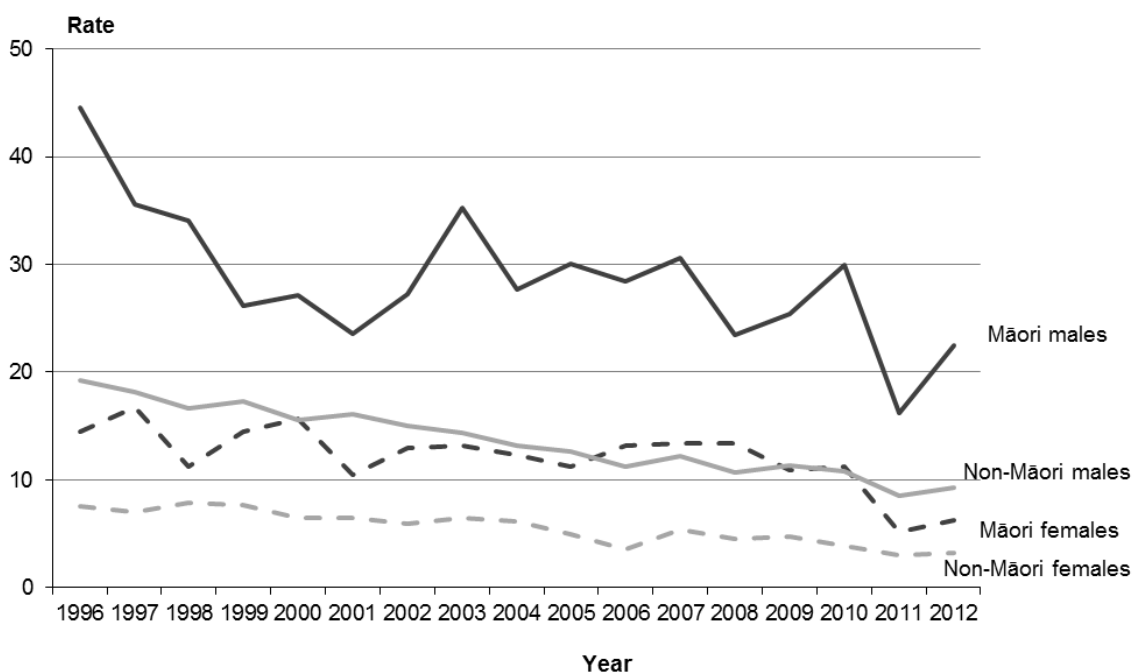
Note: rates per 100,000 population.

Māori had a motor vehicle accident mortality rate more than twice that of non-Māori in 2012 (14.1 deaths per 100,000, compared with 6.2 deaths per 100,000 non-Māori).

For all groups shown in Figure 35, mortality rates were significantly lower in 2012 compared with 1996 (using 95% confidence intervals).<sup>10</sup> Of rates for these groups, the rate for Māori males showed the biggest decline, decreasing by 38.4% over this time.

In 2012, the mortality rate for Māori males was 2.4 times the rate for non-Māori males. For females, the Māori rate was twice the non-Māori rate.

**Figure 35: Mortality rates from motor vehicle accidents, by sex and ethnicity, 1996–2012**



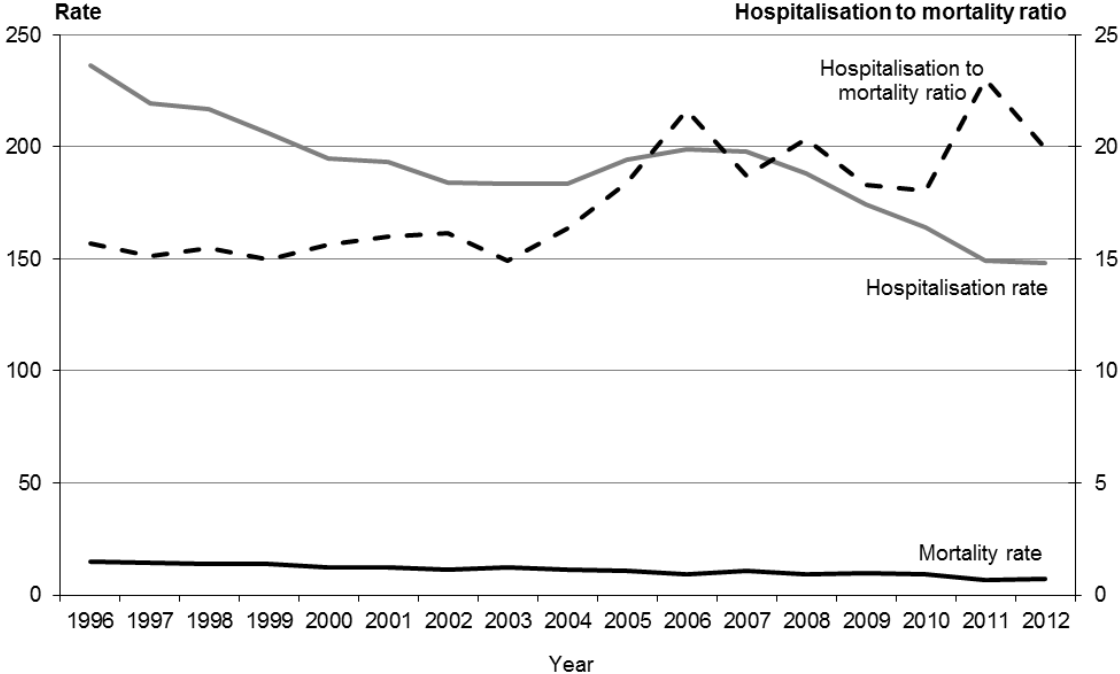
Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

Figure 36 shows the rate of hospitalisations alongside the mortality rate from motor vehicle accidents between 1996 and 2012. Both the hospitalisation and the mortality rates showed a significant decline over this period. The motor vehicle accident mortality rate fell from 15.1 per 100,000 total population in 1996 to 7.4 per 100,000 in 2012. The hospitalisation rate fell from 236.6 per 100,000 total population in 1996 to 148.3 per 100,000 in 2012.

The ratio line shows how many motor vehicle hospitalisation incidents occurred for every mortality incident over these years. In 2012, for example, there were 20 motor vehicle accident-related hospitalisations for every death. The general upward trend of the ratio line suggests that people injured in a motor vehicle accident were less likely to die over this time period.

<sup>10</sup> Confidence intervals were calculated for all rates, although they are not shown in Figure 35. For more information on confidence intervals, see 'Confidence intervals' within 'Statistical notes'.

**Figure 36: Mortality and hospitalisation rates from motor vehicle accidents, and ratio of hospitalisation rate to mortality rate, 1996–2012**



**Notes:**

Rates per 100,000 population, age-standardised to WHO World Standard Population.  
 In the interests of making the data comparable between DHBs, the hospitalisation data used to produce this figure excludes short-stay emergency department events.<sup>11</sup>  
 Some events will have been included in both the hospitalisation and the mortality count, taking into account people who were injured then subsequently died in hospital.

<sup>11</sup> For further information see the short-stay emergency department data factsheet: [www.health.govt.nz/publication/factsheet-short-stay-emergency-department-events](http://www.health.govt.nz/publication/factsheet-short-stay-emergency-department-events)

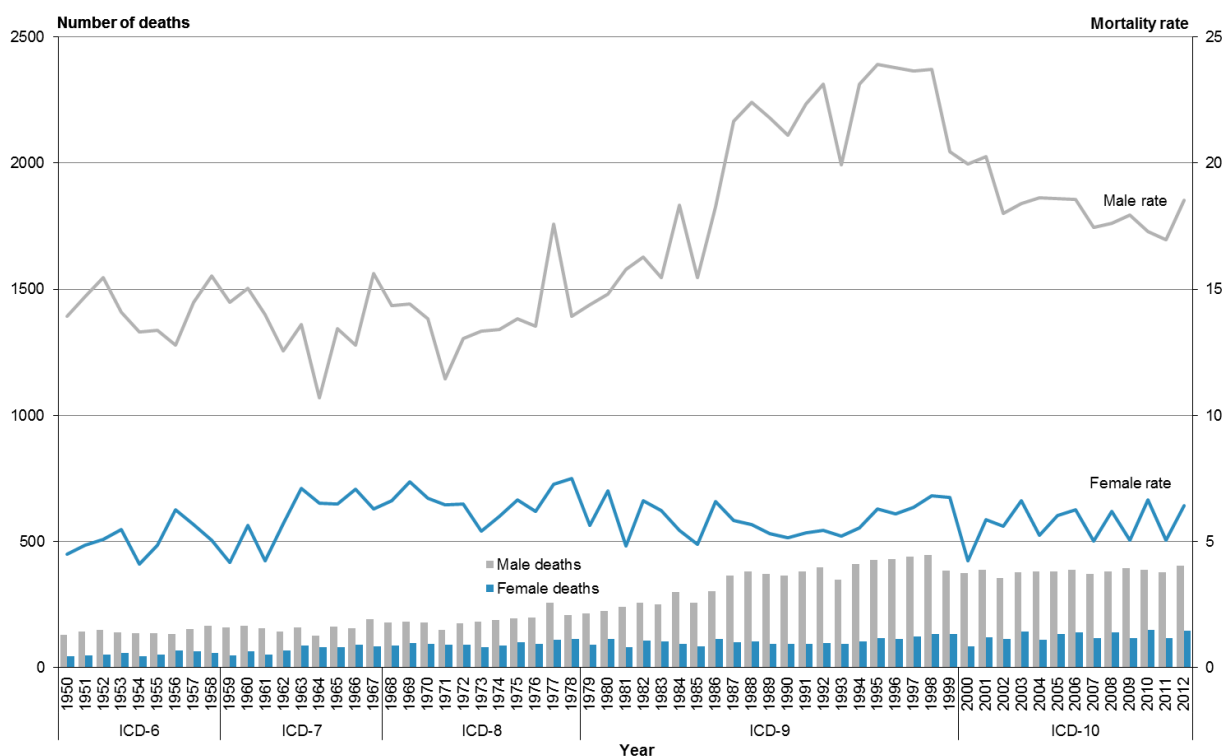
# Suicide

The ICD codes X60–X84 covers acts of intentional self-harm. Mortality from intentional self-harm is commonly referred to as suicide. This section provides an overview of suicide mortality; for a more detailed analysis see the Ministry of Health publication series *Suicide Facts: Deaths and Intentional Self-harm Hospitalisations*.<sup>12</sup> The numbers presented here are taken from the final data for 2012 suicide mortality, and so differ slightly from the provisional data in the 2012 *Suicide Facts* publication.

In 2012, 550 suicides occurred in New Zealand, as determined following coronial investigation. Males made up three-quarters (73.5%) of these deaths.

After 1950, the male suicide rate reached a peak in 1995, then declined to a rate of 18.5 deaths per 100,000 males in 2012 (Figure 37). The female rate remained relatively stable between 1950 and 2012. In 2012 the rate for females was 6.4 deaths per 100,000.

**Figure 37: Number of deaths and mortality rates from suicide, by sex, 1950–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

Between 1980 and 2012 the male suicide rate was consistently higher than the female rate (Table 24). The biggest disparity occurred in 2000, when the male rate was more than 4.5 times the female rate. In 2012 the male rate was almost three times the female rate.

<sup>12</sup> [www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/suicide-facts-deaths-and-intentional-self-harm-hospitalisations-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/suicide-facts-deaths-and-intentional-self-harm-hospitalisations-series)

**Table 24: Number of deaths and mortality rates from suicide, by sex, 1980–2012**

Year	Male		Female		Total	
	No.	Rate	No.	Rate	No.	Rate
1980	225	14.8	112	7.0	337	10.8
1981	241	15.8	79	4.8	320	10.2
1982	257	16.3	107	6.6	364	11.3
1983	250	15.5	102	6.2	352	10.7
1984	297	18.3	92	5.4	389	11.7
1985	255	15.5	83	4.9	338	10.0
1986	301	18.3	113	6.6	414	12.3
1987	363	21.7	100	5.8	463	13.6
1988	381	22.4	103	5.7	484	13.9
1989	372	21.8	93	5.3	465	13.4
1990	363	21.1	92	5.1	455	13.0
1991	380	22.3	94	5.4	474	13.7
1992	397	23.1	96	5.4	493	14.1
1993	349	19.9	94	5.2	443	12.5
1994	409	23.1	103	5.5	512	14.1
1995	427	23.9	116	6.3	543	15.0
1996	428	23.8	112	6.1	540	14.7
1997	440	23.7	121	6.3	561	14.8
1998	445	23.7	132	6.8	577	15.1
1999	385	20.4	131	6.8	516	13.4
2000	375	20.0	83	4.2	458	11.9
2001	388	20.3	119	5.9	507	12.9
2002	353	18.0	113	5.6	466	11.6
2003	376	18.4	141	6.6	517	12.4
2004	379	18.6	109	5.2	488	11.7
2005	380	18.6	131	6.0	511	12.2
2006	388	18.6	138	6.3	526	12.2
2007	371	17.4	116	5.0	487	11.0
2008	381	17.6	139	6.2	520	11.8
2009	393	17.9	117	5.0	510	11.3
2010	386	17.3	149	6.6	535	11.8
2011	377	17.0	116	5.1	493	10.9
2012	404	18.5	146	6.4	550	12.3

Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

In 2012, a high proportion of Māori suicide deaths occurred in the younger age groups. More than half of all Māori suicide deaths (58.0%) were among those aged 5–24 years. The proportion in the equivalent age-group for non-Māori was 21.1%. Conversely, a higher proportion of non-Māori suicide deaths occurred among those aged 65 and over, compared with the equivalent Māori age group (13.2% for non-Māori and 0.8% for Māori).

While Māori had higher age-specific mortality rates from suicide in the younger age groups (those aged less than 45 years), rates for Māori aged 45 years and over were lower than the corresponding rates for non-Māori. Table 25 shows the 2012 percentage distribution of deaths and age-specific mortality rates from suicide for five age groupings for Māori and non-Māori.

**Table 25: Age distribution of deaths from suicide, percentages and rates, by ethnicity and sex, 2012**

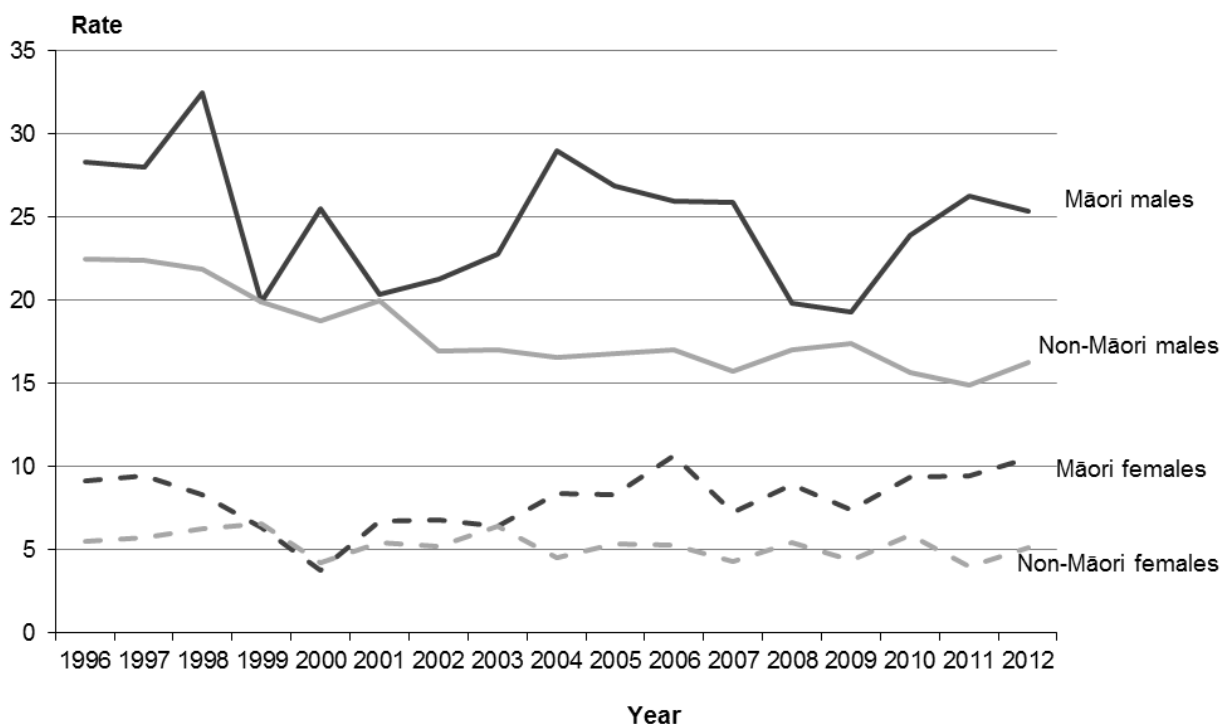
Age group (years)	Percentage						Age-specific rate					
	Māori			Non-Māori			Māori			Non-Māori		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
5–14	6.1	8.1	6.7	0.6	1.8	0.9	6.8	4.3	5.6	0.9	0.9	0.9
15–24	45.1	64.9	51.3	21.4	16.5	20.2	57.2	38.4	48.0	25.9	7.3	16.9
25–44	36.6	24.3	32.8	34.8	31.2	33.9	38.1	10.1	23.2	22.9	6.6	14.6
45–64	11.0	2.7	8.4	30.1	36.7	31.8	16.0	1.6	8.4	19.9	7.8	13.7
65+	1.2	0.0	0.8	13.0	13.8	13.2	6.4	0.0	2.9	15.8	4.8	9.9

Note: rates per 100,000 population.

In 2012, Māori had a mortality rate from suicide of 17.6 deaths per 100,000, compared with 10.6 deaths per 100,000 non-Māori.

Compared with their female counterparts, both Māori males and non-Māori males had significantly higher mortality rates in 2012 (Figure 38).<sup>13</sup>

**Figure 38: Mortality rates from suicide, by sex and ethnicity, 1996–2012**



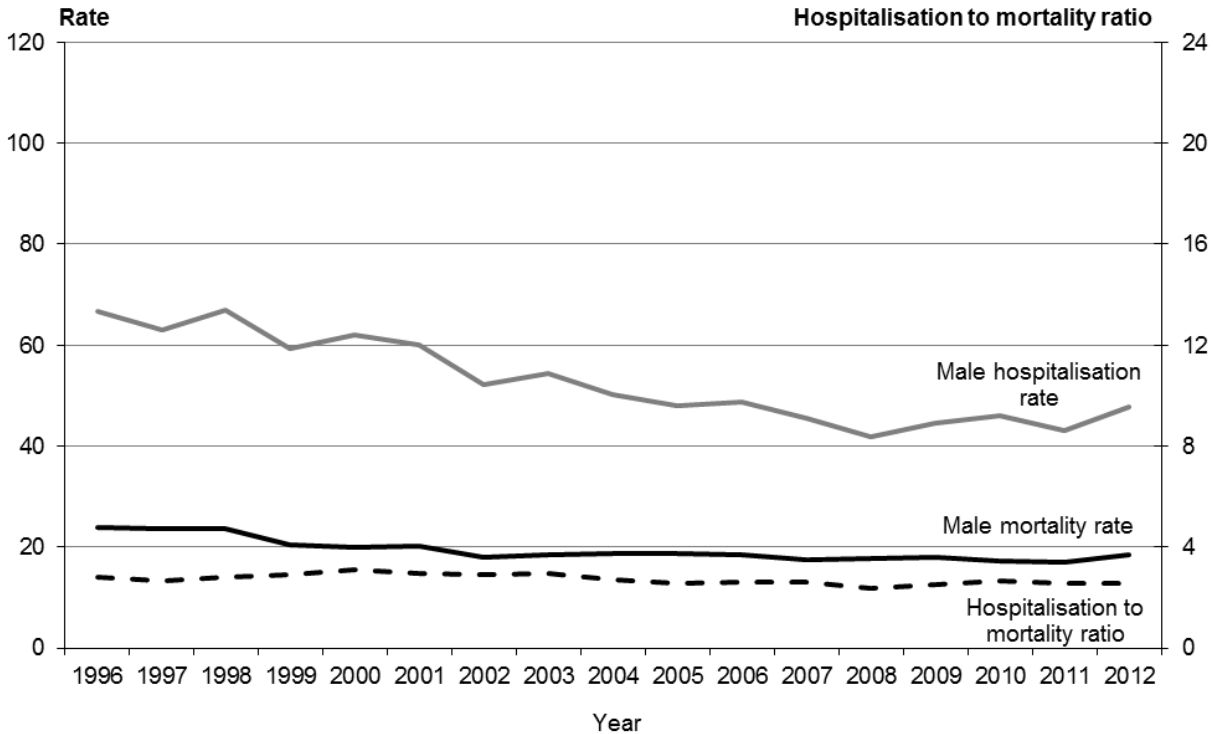
Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

<sup>13</sup> Confidence intervals were calculated for all rates, although they are not shown in Figure 38. For more information on confidence intervals, see 'Confidence intervals' within 'Statistical notes'.

Figures 39 and 40 show the rate of intentional self-harm hospitalisations alongside the mortality rate for suicide between 1996 and 2012 for males and females. Note that the hospitalisation figures exclude short-stay emergency department data, in line with the methodology used for motor vehicle accident hospitalisations in this publication and in line with that used in the *Suicide Facts* publication series.

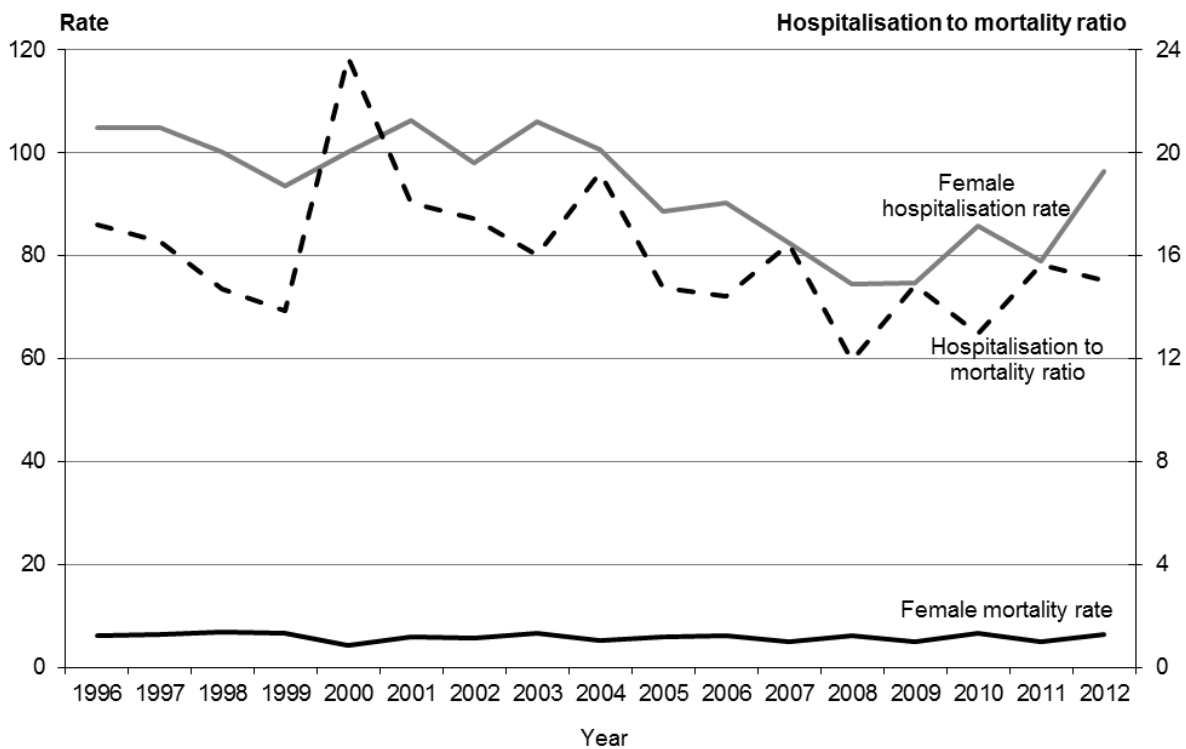
There is a distinct difference between males and females in regard to intentional self-harm hospitalisation rates relative to suicide mortality rates. Males have a lower ratio of hospitalisations to deaths than females.

**Figure 39: Male mortality and hospitalisation rates from intentional self-harm, and ratio of hospitalisation rate to mortality rate, 1996–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.

**Figure 40: Female mortality and hospitalisation rates from intentional self-harm, and ratio of hospitalisation rate to mortality rate, 1996–2012**



Note: rates per 100,000 population, age-standardised to WHO World Standard Population.



# Maternal mortality

According to the WHO a maternal death is ‘the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes’ (WHO 2004).

The WHO categorises maternal deaths into two groups:

1. Direct obstetric deaths: those resulting from obstetric complications of the pregnant state (pregnancy, labour or puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above.
2. Indirect obstetric deaths: those resulting from previous existing disease or disease that developed during pregnancy and was not due to direct obstetric causes but that was aggravated by the physiologic effects of pregnancy.

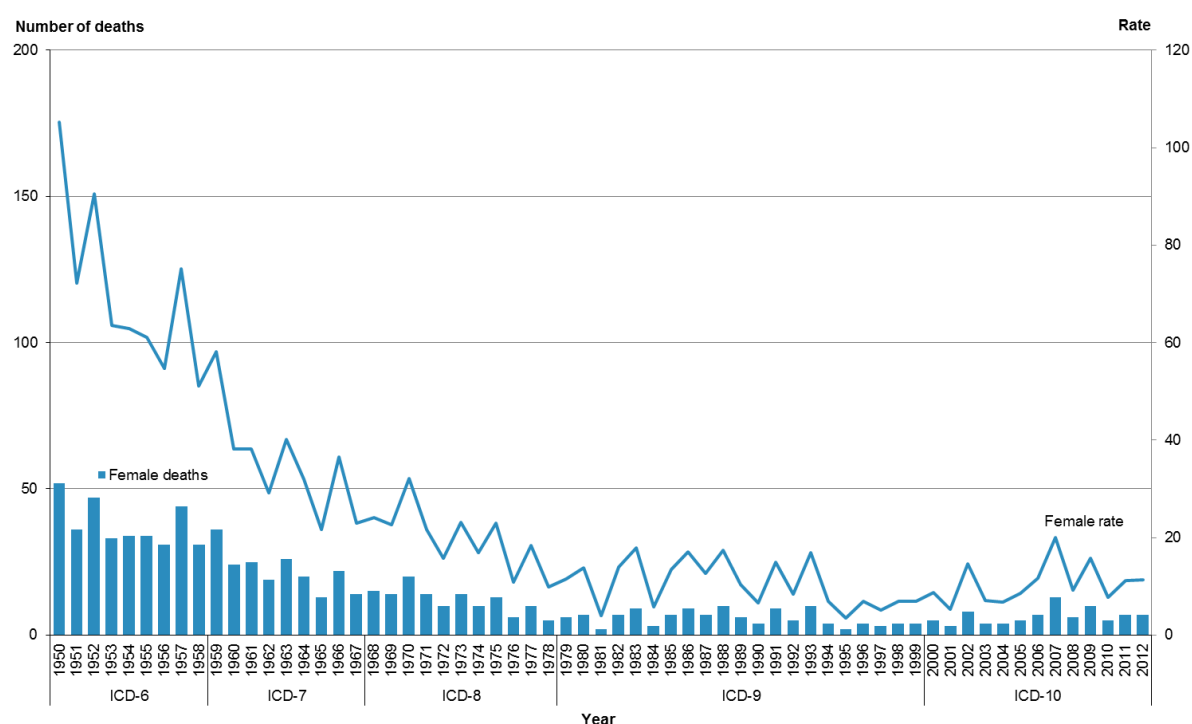
These definitions exclude maternal deaths occurring 42 days after the termination (end) of pregnancy. This section covers ICD codes O00–O95, O98–O99.

The number of maternal deaths in New Zealand each year is relatively small, so annual maternal death rates may vary substantially. Caution is advised when comparing rates over time.

A total of seven maternal deaths occurred in 2012, equating to a rate of 11.3 deaths per 100,000 live births.

The number and rate of maternal deaths decreased markedly from the 1950s to the late 1970s (Figure 41). There were 52 deaths in 1950 (105.2 deaths per 100,000 live births) compared to six deaths in 1979 (11.5 deaths per 100,000). From the late 1970s the decline in the rate of maternal deaths slowed and became more stable compared to previous years.

**Figure 41: Number of maternal deaths and maternal mortality rates, 1950–2012**



Note: rates per 100,000 live births.

From 1980 to 2012 the number of maternal deaths ranged between two (in both 1981 and 1995) and 13 (in 2007) (Table 26). The highest rate of maternal deaths over this period was 20.0 deaths per 100,000 live births in 2007. The lowest rate was 3.5 deaths per 100,000 live births in 1995.

**Table 26: Number of maternal deaths and maternal mortality rates, 1980–2012**

Year	Direct		Indirect		Total	
	Number	Rate	Number	Rate	Number	Rate
1980	7	13.8	0	0.0	7	13.8
1981	2	3.9	0	0.0	2	3.9
1982	7	14.0	0	0.0	7	14.0
1983	7	13.9	2	4.0	9	17.8
1984	3	5.8	0	0.0	3	5.8
1985	6	11.6	1	1.9	7	13.5
1986	6	11.4	3	5.7	9	17.0
1987	4	7.2	3	5.4	7	12.7
1988	5	8.7	5	8.7	10	17.4
1989	4	6.9	2	3.4	6	10.3
1990	3	5.0	1	1.7	4	6.6
1991	7	11.7	2	3.3	9	15.0
1992	2	3.4	3	5.1	5	8.4
1993	6	10.2	4	6.8	10	17.0
1994	4	7.0	0	0.0	4	7.0
1995	2	3.5	0	0.0	2	3.5
1996	4	7.0	0	0.0	4	7.0
1997	2	3.5	1	1.7	3	5.2
1998	1	1.7	3	5.2	4	6.9
1999	3	5.2	1	1.7	4	7.0
2000	2	3.5	3	5.3	5	8.8
2001	0	0.0	3	5.3	3	5.3
2002	4	7.3	4	7.3	8	14.7
2003	3	5.3	1	1.8	4	7.1
2004	1	1.7	3	5.1	4	6.8
2005	3	5.1	2	3.4	5	8.5
2006	4	6.6	3	5.0	7	11.6
2007	7	10.7	6	9.2	13	20.0
2008	3	4.6	3	4.6	6	9.2
2009	5	7.9	5	7.9	10	15.8
2010	2	3.1	3	4.6	5	7.7
2011	2	3.2	5	8.0	7	11.3
2012	2	3.2	5	8.1	7	11.3

Note: rates per 100,000 live births.

From 2008 to 2012, indirect maternal deaths accounted for 60% of all maternal deaths (Table 27). Of the 21 women who died of an indirect maternal cause between 2008 and 2012, the majority died as a result of diseases of the circulatory system (8 women) and diseases of the respiratory system complicating pregnancy, childbirth and the puerperium (7 women). The remaining women died as a result of either:

- endocrine, nutritional and metabolic diseases
- mental disorders and diseases of the nervous system
- diseases of the skin and subcutaneous tissue, or
- other specified diseases and conditions complicating pregnancy, childbirth and the puerperium.

Direct maternal deaths made up the remaining 40%. Of the 14 women who died of a direct maternal cause, five women died as a result of an obstetric embolism.

**Table 27: Maternal deaths by underlying cause, 2008–2012**

Underlying cause of death by ICD 3-character code	2008	2009	2010	2011	2012	2008–2012	
						Number	Percent
<b>Direct maternal deaths (O00–O95)</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>14</b>	<b>40.0</b>
Pre-existing hypertension complicating pregnancy, childbirth and the puerperium (O10)	–	–	–	1	–	1	2.9
Gestational (pregnancy-induced) hypertension with significant proteinuria (O14)	1	1	–	–	–	2	5.7
Maternal care for other conditions predominantly related to pregnancy (O26)	–	–	1	–	–	1	2.9
Other disorders of amniotic fluid and membranes (O41)	–	–	–	–	1	1	2.9
Placental disorders (O43)	1	–	–	–	–	1	2.9
Other obstetric trauma (O71)	–	1	–	–	–	1	2.9
Other complications of labour and delivery, not elsewhere classified (O75)	–	–	1	–	–	1	2.9
Venous complications in the puerperium (O87)	–	–	–	1	–	1	2.9
Obstetric embolism (O88)	1	3	–	–	1	5	14.3
<b>Indirect maternal deaths (O98–O99)</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>5</b>	<b>5</b>	<b>21</b>	<b>60.0</b>
Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (O99)	3	5	3	5	5	21	60.0
<b>Total maternal deaths</b>	<b>6</b>	<b>10</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>35</b>	<b>100.0</b>
Live births	65,333	63,285	64,699	62,174	62,035	–	–

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# Further mortality-related information

## Accompanying online tables

Statistical mortality data tables are available online in Excel format alongside the *Mortality and Demographic Data* publication at: [www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/mortality-and-demographic-data-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/mortality-and-demographic-data-series)

The tables published on this page contain mortality data for the complete range of ICD-10-AM classifications, in sex and five-year age groupings. The data is grouped at national, regional and ethnic group level.

## Ministry of Health publications

Further detailed information may be found in the following Ministry of Health publications:

- Further detailed information on numbers and rates of live births, and fetal, neonatal and post-neonatal deaths, is published in the annual series *Fetal and Infant Deaths* ([www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/fetal-and-infant-deaths-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/fetal-and-infant-deaths-series)).
- Further information on cancer incidence and mortality can be found in the annual series *Cancer: New registrations and deaths* ([www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/cancer-new-registrations-and-deaths-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/cancer-new-registrations-and-deaths-series)).
- Information on hospitalisations and mortality from intentional self-harm can be found in the annual series *Suicide Facts: Deaths and intentional self-harm hospitalisations* ([www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/suicide-facts-deaths-and-intentional-self-harm-hospitalisations-series](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/suicide-facts-deaths-and-intentional-self-harm-hospitalisations-series)). Suicide prevention information can be found at [www.health.govt.nz/our-work/mental-health-and-addictions/working-prevent-suicide](http://www.health.govt.nz/our-work/mental-health-and-addictions/working-prevent-suicide)

These publications, and others produced by the Ministry of Health, can be found through [www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets](http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets)

## Publications by other organisations

### Serious injury outcome indicator reports

Statistics New Zealand produces annual serious injury outcome indicator reports. These reports include numbers and rates of death from suicide, assault and motor vehicle traffic crashes (MVTC). The information for these reports is also sourced from the New Zealand Mortality Collection, and is therefore broadly comparable with the information published in *Mortality and Demographic Data*. However, the Mortality Collection is a dynamic database; any small discrepancies in data between the two publications are therefore likely to be due to updates to records in the database over time.

The serious injury outcome indicator reports also present data on ‘serious non-fatal intentional self-harm injury’ and ‘serious non-fatal MVTC injury’. These indicators cover only a subset of the self-harm hospitalisation data and motor vehicle accidents data analysed in this publication, and therefore cannot be directly compared.

For more information and access to the serious injury outcome indicator reports see [www.stats.govt.nz/browse\\_for\\_stats/health/injuries/serious-injury-outcome-indicators-reports.aspx](http://www.stats.govt.nz/browse_for_stats/health/injuries/serious-injury-outcome-indicators-reports.aspx)

For further information relating to the methodology, classifications and processes used to produce this publication, and how they differ between publications, contact [data-enquiries@moh.govt.nz](mailto:data-enquiries@moh.govt.nz)

## **Population data used for calculating rates**

For population and other demographic data, contact the Ministry of Health (email: [data-enquiries@moh.govt.nz](mailto:data-enquiries@moh.govt.nz)) or Statistics New Zealand ([www.stats.govt.nz](http://www.stats.govt.nz) or email: [info@stats.govt.nz](mailto:info@stats.govt.nz)).

## **Additional data available from the Ministry of Health**

The Ministry of Health collects and records the information presented in Table 28 for all deaths in New Zealand. For a full listing of available fields, refer to the Mortality Collection Data Dictionary (available at: [www.health.govt.nz/publication/mortality-collection-data-dictionary](http://www.health.govt.nz/publication/mortality-collection-data-dictionary)).

You may require information not included in this report or in the accompanying online tables. The Ministry of Health is able to produce customised data extracts tailored to your needs. These may incur a charge (at Official Information Act rates). If you require additional data or analysis, contact:

Analytical Services  
Ministry of Health  
PO Box 5013  
Wellington, 6145  
New Zealand

Phone (04) 496 2000  
Fax (04) 816 2898  
Email: [data-enquiries@moh.govt.nz](mailto:data-enquiries@moh.govt.nz)  
or visit: [www.health.govt.nz](http://www.health.govt.nz)

The Ministry of Health welcomes comments and suggestions about this publication.

**Table 28: Mortality data available from the Ministry of Health**

Item	Notes
1 Health care user number	Also known as National Health Index number. Restricted access.
2 Domicile code	Based on Statistics New Zealand Standard Area Unit code used for the 2006 Census.
3 Sex	Male, female, indeterminate.
4 Ethnicity	Based on Statistics New Zealand Standard Classification 1996 (Level 2); for example, NZ Māori, NZ European or Pākeha, Other European, Samoan, Chinese and so on. Up to three ethnicities are recorded and prioritised.
5 Age	Age in days, weeks, months or years, as applicable.
6 Date of birth	Day, month, year.
7 Country of birth	From Statistics New Zealand Standard Country Code list, 1986.
8 Time deceased was in New Zealand	Number of years in New Zealand if not born in New Zealand.
9 Date of death	Day, month, year.
10 Year of registration	Year in which the death was registered.
11 Place died	Place of death as recorded on the death registration.
12 Underlying cause of death	Codes from ICD-10-AM from 2000 onwards.
13 Selected contributing disease or condition	Codes from ICD-10-AM for selected conditions that contributed to death but were not the underlying cause of death (eg, diabetes mellitus, drug abuse and injuries) from 2000 onwards.
14 Mesh block	Statistics New Zealand's smallest area unit code, based on deceased's residential address, from 2003 onwards. Restricted access.
15 Cot death indicator	Sudden infant death syndrome indicator.
16 Maternal death indicator	Indicates whether the death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.
17 Pregnancy-related indicator	Indicates if a woman died while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death.
18 Post-mortem code	Indicates whether a post-mortem was performed and/or used in classification by the Ministry of Health.
19 Death certifier code	Certified by doctor, or coroner with/without inquest, coroner's interim report.
20 Death information source code	Code indicating the most accurate source of the information used to classify the underlying cause of death; for example, Births, Deaths and Marriages, Coronial Services, Land Transport New Zealand, Water Safety New Zealand.
21 Comments	Free text field for additional comments relating to the death (eg, may include details of accidents or time sequence of conditions). Restricted access.
22 Occupation	Text description of deceased's usual occupation (or former occupation, if retired). Collected since 1998.
23 Work-related indicator	Recorded if the cause of death was known to be due to an accident while at work from 2000 onwards.
24 Alcohol-involved indicator	Records if alcohol consumption preceded death, when reported from 2000 onwards. Only recorded for deaths certified by a coroner.
25 Blood alcohol level	Recorded in mg/100 mL blood, when reported from 2000 onwards. Only recorded for deaths certified by a coroner.
26 Birthweight	Weight at birth in grams. Recorded when known for deaths of infants less than one year of age and for stillbirths.
27 Gestation	Gestation (in weeks) of infant at birth. Recorded when known for deaths of infants less than one year of age and for stillbirths.

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# Explanatory notes

## Mortality

### Deaths

Every death occurring in New Zealand must be registered with Births, Deaths and Marriages. Deaths should be registered within three working days of burial or cremation, although the law does not impose any limit on the time after which a death may not be registered.

This information, along with stillbirth registration data, is supplied to the Ministry of Health. The Ministry of Health then matches death and stillbirth registrations from the Registry with individuals' National Health Index numbers. This combined information comprises the death registration data held in the National Mortality Collection (MORT).

The statistics in this publication relate to registrations during the year 2012, rather than the actual number of deaths during the year 2012.

### Causes of death

The ICD-10-AM was used to classify causes of death throughout this report (National Centre for Classification in Health 2008). The WHO regularly revises the ICD publication, and issues updates in the form of new revisions; for example, ICD-10 is the Tenth Revision.

If more than one cause is entered on a medical certificate, the Mortality Collection follows WHO mortality rules and guidelines (as specified in ICD-10) for identifying the underlying cause of death. This is largely determined from the statement of the certifying doctor or coroner, but reference is also made to post-mortem reports received, and cancer registrations. On some occasions, coded hospital inpatient event summaries are compared with entries on the medical certificate in order to obtain more specific information. Information is also obtained from letters to certifying doctors and medical records departments, from data supplied by Land Transport New Zealand and Water Safety New Zealand, from the internet and from Coronial Services.

When a death is due to an external cause, such as an accident, the external cause and not the resulting injury is coded as the underlying cause of death. For example, if a death is due to a head injury as a result of a motor vehicle crash, the motor vehicle crash will be coded as the cause of death. Sites and types of injuries are coded as contributing causes, if reported.

### Amenable mortality

The ICD-10-AM codes used to define amenable mortality in this publication are shown in the following table.

**Table 29: Codes used to define amenable mortality**

Group	Condition	ICD-10-AM code(s)	Notes
Infections	Pulmonary tuberculosis	A15–A16	
	Meningococcal disease	A39	
	Pneumococcal disease	A40.3, G00.1, J13	
	HIV/AIDS	B20–B24	
Cancers	Stomach cancer	C16	
	Rectal cancer	C19–C21	
	Bone and cartilage cancer	C40–C41	
	Melanoma of skin	C43	
	Female breast cancer	C50	Females only
	Cervical cancer	C53	
	Prostate cancer	C61	
	Testis cancer	C62	
	Thyroid cancer	C73	
	Hodgkin lymphoma	C81	
	Acute lymphoblastic leukaemia	C91.0	Ages 0–44 years
Maternal and infant	Complications of pregnancy	O00–O96, O98–O99	
	Complications of perinatal period	P01–P03, P05–P94	
	Cardiac septal defect	Q21	
Chronic disorders	Diabetes	E10–E14	
	Valvular heart disease	I01, I05–I09, I33–I37	
	Hypertensive diseases	I10–I13	
	Coronary disease	I20–I25	
	Pulmonary embolism	I26	
	Heart failure	I50	
	Cerebrovascular diseases	I60–I69	
	COPD	J40–J44	
	Asthma	J45–J46	
	Peptic ulcer disease	K25–K27	
	Cholelithiasis	K80	
Renal failure	N17–N19		
Injuries	Land transport accidents excluding trains	V01–V04, V06–V14, V16–V24, V26–V34, V36–V44, V46–V54, V56–V64, V66–V74, V76–V79, V80.0–V80.5, V80.7–V80.9, V82–V86, V87.0–V87.5, V87.7–V87.9, V88.0–V88.5, V88.7–V88.9, V89, V98–V99	Include V00 if using ICD-10-AM-VI (from 2008 onwards)
	Accidental falls on same level	W00–W08, W18	
	Fire	X00–X09	
	Suicide	X60–X84	
	Treatment injury	Y60–Y82	



## **Cancer mortality**

In the third edition of the International Classification of Diseases for Oncology (ICD-O), the range of neoplasms considered to be malignant was expanded. Specifically, polycythaemia vera, myelodysplastic syndromes and chronic myeloproliferative disorders are considered to be malignant in the third edition of ICD-O, whereas in the second edition these diseases were considered to be of uncertain behaviour. The ICD-10 codes for these additional malignancies are in the range D45–D47. This change took effect from 2003. *Mortality and Demographic Data 2004* was the first publication in this series to include the D45–D47 range in cancer analyses.

## **Motor vehicle accident deaths**

The ICD 10 AM codes used to define motor vehicle accident deaths in this publication are: V02–V04, V09.0–V09.3, V12–V14, V19.0–V19.2, V19.4–V19.6, V20–V79, V80.3–V80.5, V81.0–V81.1, V82.0–V82.1, V83.0–V83.3, V84.0–V84.3, V85.0–V85.3, V86.0–V87.8, V88.0–V88.8, V89.0, V89.2 and V89.9.

## **Maternal mortality**

The ICD-10-AM codes used to define maternal mortality in this publication are O00–O95: direct obstetric deaths and O98–O99: indirect obstetric deaths. This is in line with the WHO definition.

In addition to the summarised maternal mortality data in this publication, the Perinatal and Maternal Mortality Review committee within the Health Quality and Safety Commission publishes more detailed maternal mortality information in their annual report: see [www.hqsc.govt.nz/our-programmes/mrc/pmmrc/publications-and-resources/publication/2123/](http://www.hqsc.govt.nz/our-programmes/mrc/pmmrc/publications-and-resources/publication/2123/)

## **Domicile**

In general, the domicile code of the deceased is classified according to the usual residence at time of death. The domicile code used for health collections is the four-digit Health Domicile Code originally created by Statistics New Zealand from its six-digit Census Area Unit Code. In 2012, the Health Domicile Code used was based on the 2006 Census Area Unit Code.

# **Population**

## **Changes to estimating the population in New Zealand**

Statistics New Zealand produces national population estimates based on the concept of the ‘usually resident population’ (since 1991). Previously, both national and subnational estimates were based on the ‘de facto population’ concept, which included all people in New Zealand at a given time, including overseas visitors, and excluded New Zealanders temporarily overseas on Census night. Statistics New Zealand considers that the resident population concept produces a more accurate estimate.

The most significant outcome of this change is that the resulting demographic indices are slightly lower. This is because of a smaller numerator (because registrations of births, deaths and marriages of overseas visitors while in New Zealand are excluded) and a bigger denominator (due to the slightly larger population estimates).

## Population data used

The populations used to calculate rates in this report are available online in Excel format alongside this publication.

Mortality rates for 2012 were calculated using the following population data sets supplied by Statistics New Zealand:

- estimated resident population by age and sex, mean year ended 31 December 2012
- estimated resident population for Māori and non-Māori by age and sex, mean year ended 31 December 2012\*
- estimated resident population by age, sex and DHB as at 30 June 2012.

Populations used were updated with 2013 Census results except for those marked with an asterisk (\*), which were based on 2006 Census results.

Maternal mortality rates were calculated using the number of live-born babies registered with Births, Deaths and Marriages in each calendar year.

Rates presented for years prior to 2012 are as published in the 'Mortality and Demographic Data' series. They were calculated using the estimated resident population available at the time of release, and have not been recalculated for this report.

## Ethnicity

Ethnicity data for deaths mainly come from Births, Deaths and Marriages. Ethnicity data is provided to funeral directors by family members or others assisting with the death registration and recorded on the *BDM28 Notification of Death for Registration* form.

Ethnicity data for the New Zealand population is based on prioritised ethnicity. Changes in ethnicity recording came into effect in September 1995. Previously, ethnicity had been based on ancestry, with only one ethnic group ascribed to each individual (the 'sole ethnic origin' concept). The 1995 changes introduced the self-identified ethnicity model, which allows an individual to choose multiple ethnicities based on their preferences or self-concept. Multiple selected ethnicities are then prioritised into a hierarchy.

The system recognises the following key characteristics of ethnicity.

- Ethnicity is self-perceived, so people should identify their own ethnic affiliation whenever feasible.
- A person can belong to more than one ethnic group.
- The ethnicities with which a person identifies can change over time or in different contexts.

Ethnicity is a social construct of group affiliation and identity. The present Ministry of Health statistical standard for ethnicity states that 'ethnicity is the ethnic group or groups that people identify with or feel they belong to'. Thus, ethnicity is self-perceived, complex and multidimensional.

This definition is based on the work of Anthony Smith (Smith 1986).

## Prioritisation

In this publication, all individuals who identified as Māori (including those who identified with more than one ethnic group) are presented as Māori. All other individuals are presented as non-Māori, including those with no recorded ethnicity (Ministry of Health 2004). The aim of prioritisation is to ensure that when it is necessary to assign people to a single ethnic group, ethnic groups that are small or important in terms of policy are not swamped by the European ethnic group. This method is also a more robust method of dealing with the low rate of multiple ethnicities in health sector data.

Further information on ethnicity data protocols for the health and disability sector is available at [www.health.govt.nz/publication/ethnicity-data-protocols-health-and-disability-sector](http://www.health.govt.nz/publication/ethnicity-data-protocols-health-and-disability-sector)

## Statistical notes

### Age-specific rates

An age-specific rate is the rate at which a particular event (eg, death or disease incidence) occurs in each age group of a population as some unit of the population-at-risk or person-years-at-risk.

An age-specific rate is simply the crude rate for the specific age group. For example, to calculate the age-specific rate of a disease for people aged 45–49, the total number of cases in the age group is divided by the population in that age group and multiplied by a constant (a unit of population: 100,000 in this publication). This process produces death rates showing the number of deaths per 100,000 population in each age group in a particular year (Borman 1995).

### Age-standardised rates

Age-standardised death rates adjust for differences in age distribution of the populations being compared. Age-standardised rates are artificially created figures that allow comparisons to be made with differing groups; they should only be compared with other adjusted rates that have been computed using the same ‘standard’ population.

Age-standardised rates are calculated by multiplying age-specific rates by a standard population. The standard population used in these calculations is the WHO World Standard Population (Table 30). The WHO World Standard Population is a widely used New Zealand and international standard.

Different population standards will produce different mortality rates, different rankings for causes of death and different confidence intervals. For example, comparing the WHO standard population used in this publication and a Māori population shows that the all-cause mortality rate for Māori is higher using the WHO standard, and that the relative rankings of some causes of Māori death (eg, deaths from external causes) are lower (Robson et al 2007).

Further information on age-specific and age-standardised rates can be found in the Ministry of Health/Public Health Commission document *Standardising Rates of Disease*: see [www.health.govt.nz/publication/standardising-rates-disease](http://www.health.govt.nz/publication/standardising-rates-disease)

**Table 30: The WHO World Standard Population**

Age group	Population
0–4	8860
5–9	8690
10–14	8600
15–19	8470
20–24	8220
25–29	7930
30–34	7610
35–39	7150
40–44	6590
45–49	6040
50–54	5370
55–59	4550
60–64	3720
65–69	2960
70–74	2210
75–79	1520
80–84	910
85+	635
Total	100,035

Source: Waterhouse et al 1976

## Confidence intervals

Confidence intervals have been calculated for age-standardised rates at the 95% or 99% level using the method presented in Keyfitz (1966).

A confidence interval is a range of values used to describe the uncertainty around a single value (such as an age-standardised rate). It is used to estimate the true value in a population, such as the underlying or true rate. Confidence intervals are calculated with a stated probability; for example 95% (which would indicate that there is a 95% chance that the true value lies within the confidence interval).

Confidence intervals may assist in comparing rates over time or between different groups. If two confidence intervals do not overlap, then it is reasonable to assume that the difference is not due to chance. If two confidence intervals do overlap, it would only be possible to make any conclusion about the significance of any difference between the rates by conducting a statistical test of difference.

Note that the use of a standardised population such as the WHO World Standard Population tends to produce wider Māori confidence intervals than the use of a Māori-specific population.

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