MINISTRY OF HEALTH
MANATŪ HAUORA

Mortality and Demographic Data

2006

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New Zealand Government

Mortality and Demographic Data 2006

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Introduction

Mortality and Demographic Data 2006 presents data on the underlying causes of all deaths registered in New Zealand for the calendar year 2006. The causes of death were coded to the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification, Second 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 2002).

The underlying cause of death 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 the mortality data are:

- certificates of cause of death from doctors and coroners
- post-mortem reports from private pathologists and hospitals
- death registration forms which are usually completed by the funeral director.

Late data

Due to the extended length of time that some coronial inquiries take, the Ministry of Health has been unable to assign provisional causes of death to a small number of deaths at the time of publication. These deaths are included in the statistics under the ICD codes R99 ('unspecified causes of mortality') and X59 ('exposure to unspecified factor'). Because the Ministry of Health Mortality Collection is a dynamic database, the records for these deaths will be updated in the mortality database with specific underlying cause of death codes once the coroners' findings are received. This means there may be small differences between other extracts of mortality data and that contained in this publication.

At the time of publication, there were four post-neonate deaths (greater than 28 days of age and less than one year), one youth death (15–24 years) and nine adult deaths (25 years and over) provisionally coded to underlying cause R99 and X59. These are awaiting the coroners' findings as to cause of death.

Changes to the format of *Mortality and Demographic Data*

Prior to the 2002 and 2003 edition of the *Mortality and Demographic Data* series, the publication comprised two sections: a commentary (summarising key facts, mortality rates, trends and major causes of death by age group and sex) and statistical tables (presenting data on actual numbers of deaths by age, sex, District Health Board district and ICD code).

The 2002 and 2003 edition of *Mortality and Demographic Data* was the first to publish the statistical tables online. These tables are available at http://www.nzhis.govt.nz/moh.nsf/pagesns/33?Open#09 in Excel format (refer to the Further mortality-related information section for a full list).

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 were identified as Māori, and the non-Māori population includes all the rest.

Because of changes in ethnicity recording 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, 1996–2006) than that of the total population data (see Ethnicity notes in the Explanatory notes section for a discussion of issues associated with ethnicity coding).

Statistical notes

In this publication, numbers are generally rounded 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 employs *crude*, *age-specific* and *age-standardised* rates.

A crude mortality rate is the number of deaths divided by the appropriate population, and then multiplied by 100,000. When interpreting crude rates it is important to note that rates may be affected by differences in population structures. For example, if a region contains high numbers of older people this would generally result in higher crude death rates.

Age-specific mortality rates calculate the number of deaths in relation to the population size of a particular age group. Age-standardised rates account for differences in population structure, and can be used to compare groups with different age structures (eg, males and females, Māori and non-Māori) and data from different years. In the present publication, the population structure employed is the WHO World Standard Population, and age-standardised rates are per 100,000 population (see Population notes in the Explanatory notes section).

Confidence intervals

Where appropriate, 95 percent confidence intervals have been calculated to aid the interpretation of mortality incidence (Keyfitz 1966). A confidence interval is composed of two figures or a range of numbers – an upper and lower limit – computed specifically for a given rate. Assuming a 95 percent confidence level, the range has a 95 percent chance of containing the true rate (ie, a rate unaffected by chance events). A wide interval may limit the extent to which definite statements may be made about the rate.

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

Further mortality data

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

More detailed information on numbers and rates of livebirths, fetal, neonatal and post-neonatal deaths are published in the annual publication series *Fetal and Infant Deaths* (http://www.nzhis.govt.nz/moh.nsf/pagesns/33?Open#03).

Information on maternal deaths can be found in *Report on Maternity: Maternal and newborn information* (http://www.nzhis.govt.nz/moh.nsf/pagesns/33?Open#05).

For a complete listing of other mortality-related data, see the Further mortality-related information section in this publication.

Quick Facts

Mortality overview

Raw numbers

	2006 deaths		
	Total	**Male**	**Female**
Māori deaths	2,829	1,547	1,282
Non-Māori deaths	25,560	12,476	13,084
Total deaths	28,389	14,023	14,366

Age-standardised rates

	2006 death rates*		
	Total	**Male**	**Female**
Māori deaths	769.7	896.8	658.9
Non-Māori deaths	404.1	483.2	337.8
Total deaths	434.3	517.3	364.3

Selected causes of mortality 2006

Condition	**Total deaths**	**Percentage of deaths**		**Māori ASR***		**Non-Māori ASR***	
		Male	**Female**	**Male**	**Female**	**Male**	**Female**
All cancers	8094	51.2	48.8	227.2	212.3	145.7	110.7
Trachea, bronchus and lung cancers	1457	54.8	45.2	63.8	64.7	26.6	17.8
Female breast cancer	614	...	100.0	...	35.6	...	19.0
Prostate cancer	559	100.0	...	30.9	...	18.8	...
Cervical cancer	52	...	100.0	...	4.4	...	1.4
Melanoma of the skin	287	60.3	39.7	--	--	6.7	3.7
Ischaemic heart disease	5912	53.0	47.0	221.7	115.6	102.3	54.7
Cerebrovascular disease	2674	37.4	62.6	36.1	46.5	33.9	34.6
Diabetes mellitus	860	52.0	48.0	70.4	40.7	12.4	9.2

* Age-standardised rate of death, per 100,000 population.

... = not applicable.

-- = number too small to be expressed.

Māori mortality from melanoma of the skin is very low (2006 n=5); because of this low number, age-standardised rates have not been calculated here.

Major Causes of Mortality

This section presents an overview of mortality statistics in 2006 and reviews selected major causes of mortality in this period.

Because of changes in ethnicity recording 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, 1996–2006) than those for the total population (see Ethnicity notes in the Explanatory notes section).

All age-standardised rates presented use the WHO World Standard Population and represent deaths per 100,000 population (see Population notes in the Explanatory notes section).

Overview of mortality statistics in 2006

There were 28,389 deaths registered in New Zealand in 2006. This is an almost identical figure to that of 10 years ago (ie, 1996), when there were 28,379 deaths.

In 2006, females accounted for 343 more deaths (14,366 total female deaths; an age-standardised rate of 364.3 deaths per 100,000) than males (14,023 total male deaths; an age-standardised rate of 517.3).

There were 2829 Māori deaths in 2006 (1547 males, 1282 females), accounting for 10 percent of total deaths. This gives an age-standardised rate of 896.8 for Māori males and 658.9 for Māori females.

Table 1 shows age-specific and age-standardised rates for all causes of death in 2006.

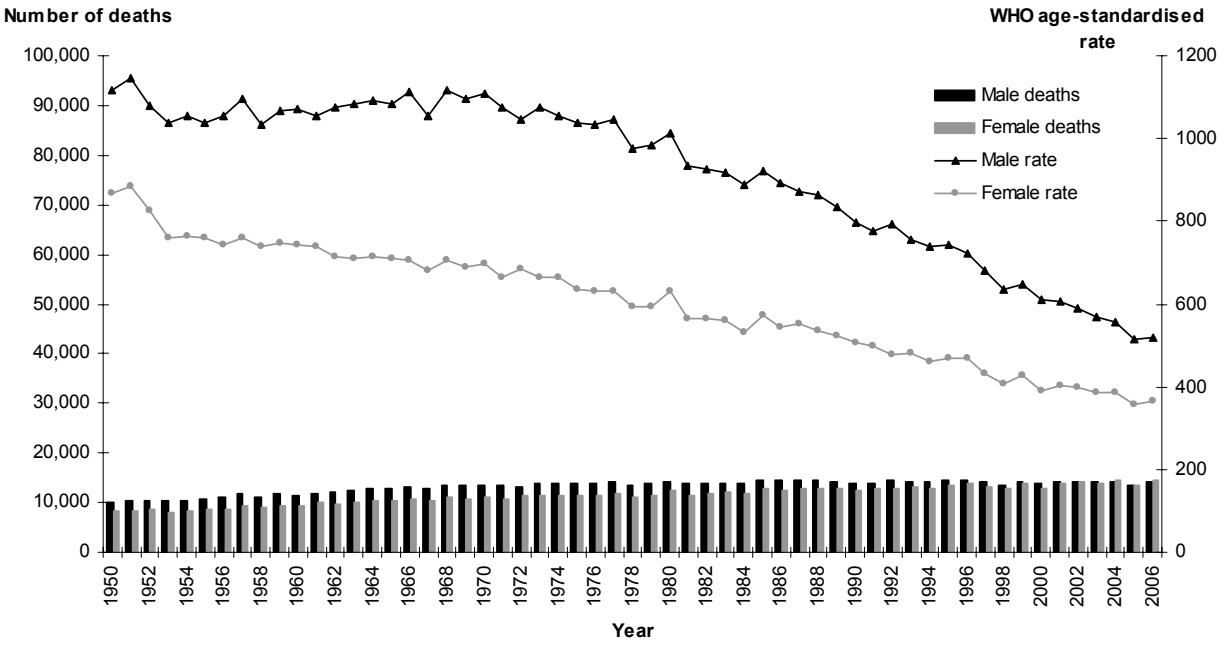
Table 1: Death rates by age group, sex and ethnicity, 2006

	Age-specific rate							Age-standardised rate (WHO)
	Under 1	1–14	15–24	25–44	45–64	65–74	75+	
Total population								
Total	513.6	16.9	62.9	94.8	434.3	1724.4	7359.0	434.3
Male	575.7	20.0	88.7	122.2	516.9	2084.6	7808.4	517.3
Female	449.0	13.6	36.7	69.4	354.4	1388.7	7050.6	364.3
Māori population								
Total	755.8	28.8	99.6	185.7	964.8	3475.9	8739.6	769.7
Male	750.0	34.4	132.6	229.3	1187.6	3995.4	9760.3	896.8
Female	761.0	22.8	67.6	147.0	760.7	3007.2	8046.5	658.9
Non-Māori population								
Total	416.2	13.2	54.2	79.6	377.1	1598.8	7315.4	404.1
Male	505.3	15.5	78.6	104.7	446.8	1950.0	7747.0	483.2
Female	324.0	10.7	29.1	56.1	309.3	1270.6	7019.0	337.8

Note: Rates per 100,000 population.

Figure 1 shows the age-standardised rates for all causes of death from 1950 to 2006

Figure 1: Death rates from all causes of death, by sex, 1950–2006



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

Table 2 shows both raw numbers and age-standardised rates of death from 1987 to 2006.

The death rate for both males and females decreased between 1987 and 2006. The male age-standardised rate in 2006 was 28.5 percent lower than in 1996 and the female rate was 22.6 percent lower.

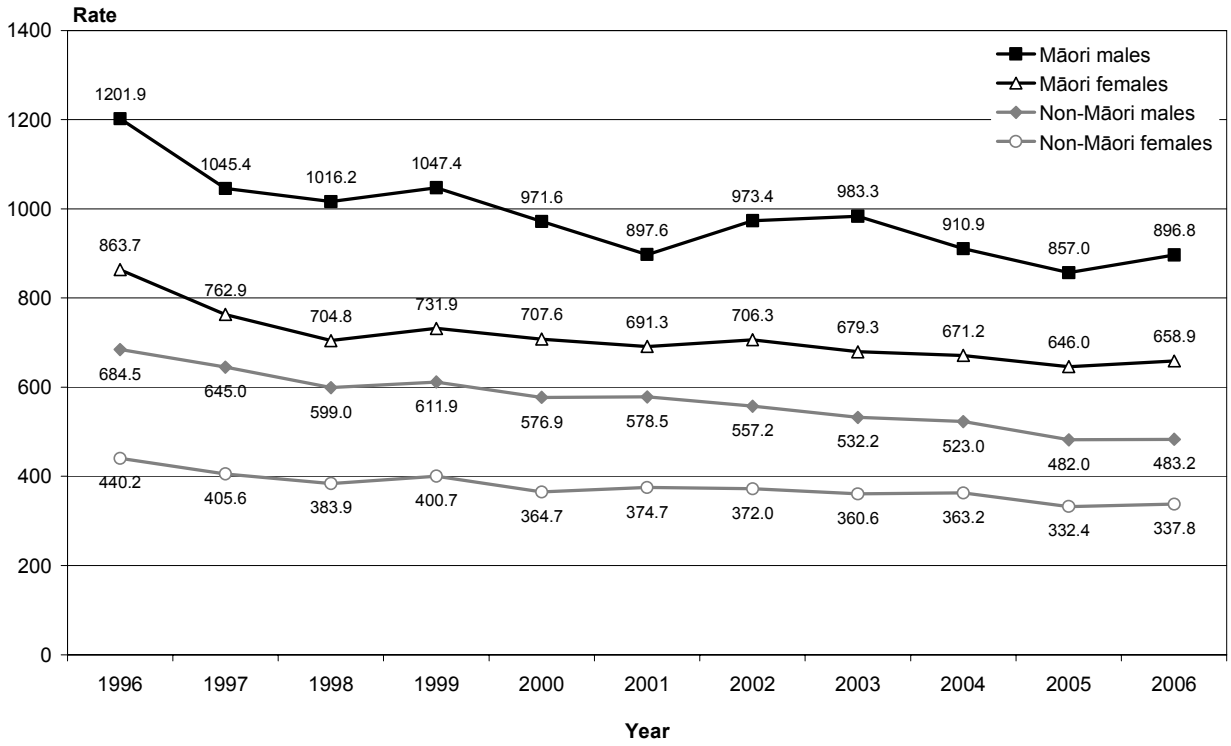
Table 2: Numbers and age-standardised death rates from all causes of death by sex, 1987–2006

Year	Males		Females	
	No.	Rate	No.	Rate
1987	14,472	872.7	12,958	553.7
1988	14,567	865.2	12,840	535.0
1989	14,332	835.6	12,712	521.5
1990	13,967	795.2	12,557	505.6
1991	13,810	775.0	12,680	496.6
1992	14,573	792.4	12,679	476.3
1993	14,178	754.6	13,031	480.2
1994	14,169	737.3	12,924	462.5
1995	14,528	741.5	13,428	470.8
1996	14,523	723.1	13,856	470.7
1997	14,297	679.5	13,315	433.3
1998	13,661	634.4	12,796	407.5
1999	14,348	648.6	13,876	426.9
2000	13,817	608.6	12,906	390.6
2001	14,166	606.0	13,968	401.8
2002	14,195	589.7	14,164	398.1
2003	14,066	567.9	13,995	385.2
2004	14,201	556.1	14,435	388.2
2005	13,494	514.2	13,647	357.2
2006	14,023	517.3	14,366	364.3

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

Figure 2 shows age-standardised death rates by sex and ethnicity from 1996 to 2006.

Figure 2: Death rates from all causes of death, by sex and ethnicity, 1996–2006



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

Over this period, Māori males have consistently had the highest rate of death. In 2006, the Māori male rate of death (896.8 per 100,000 population) was 85.6 percent higher than the non-Māori male rate (483.2 per 100,000 population).

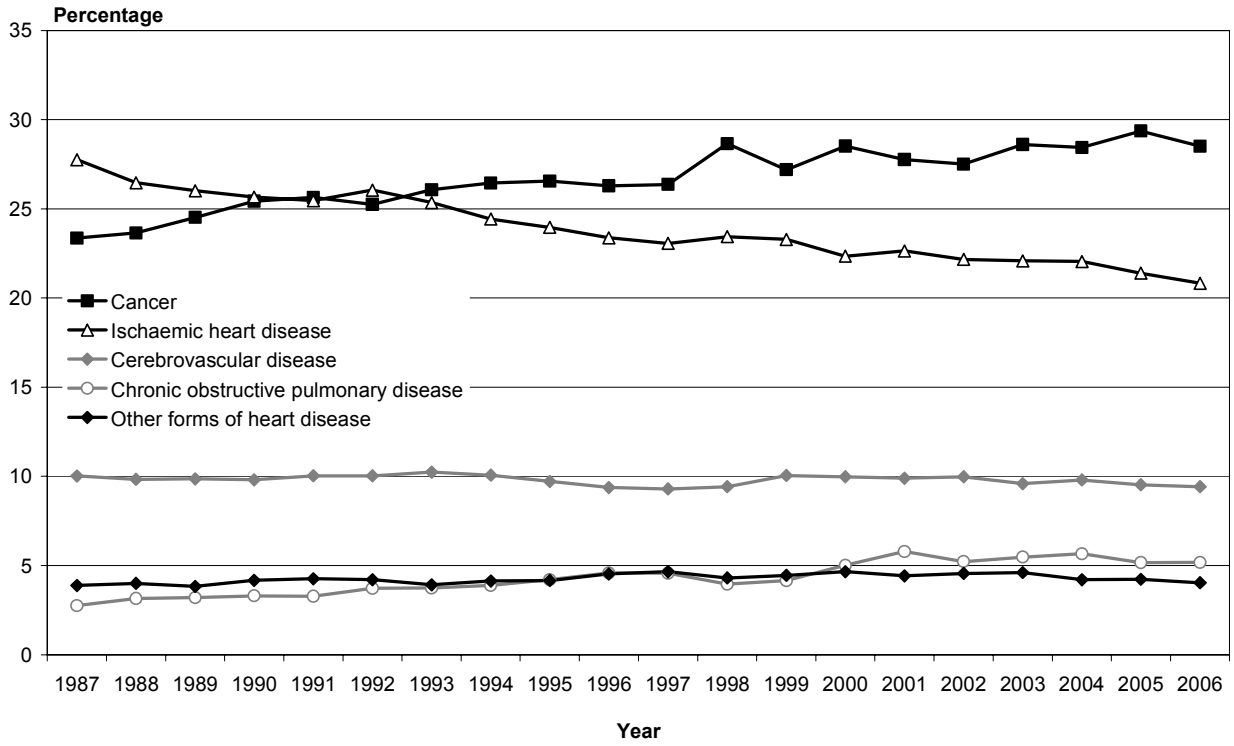
Between 1996 and 2006, Māori male age-standardised death rates decreased by 25.4 percent, while non-Māori male death rates decreased by 29.4 percent.

In 2006, Māori females had an age-standardised rate of death 95.1 percent higher than the non-Māori female rate (658.9 and 337.8 deaths per 100,000 population respectively).

Māori female age-standardised death rates decreased by 23.7 percent from 1996 to 2006, while non-Māori female death rates decreased by 23.3 percent.

Figure 3 shows five major causes of mortality for the 1987 to 2006 period.

Figure 3: Five major causes of mortality, 1987–2006



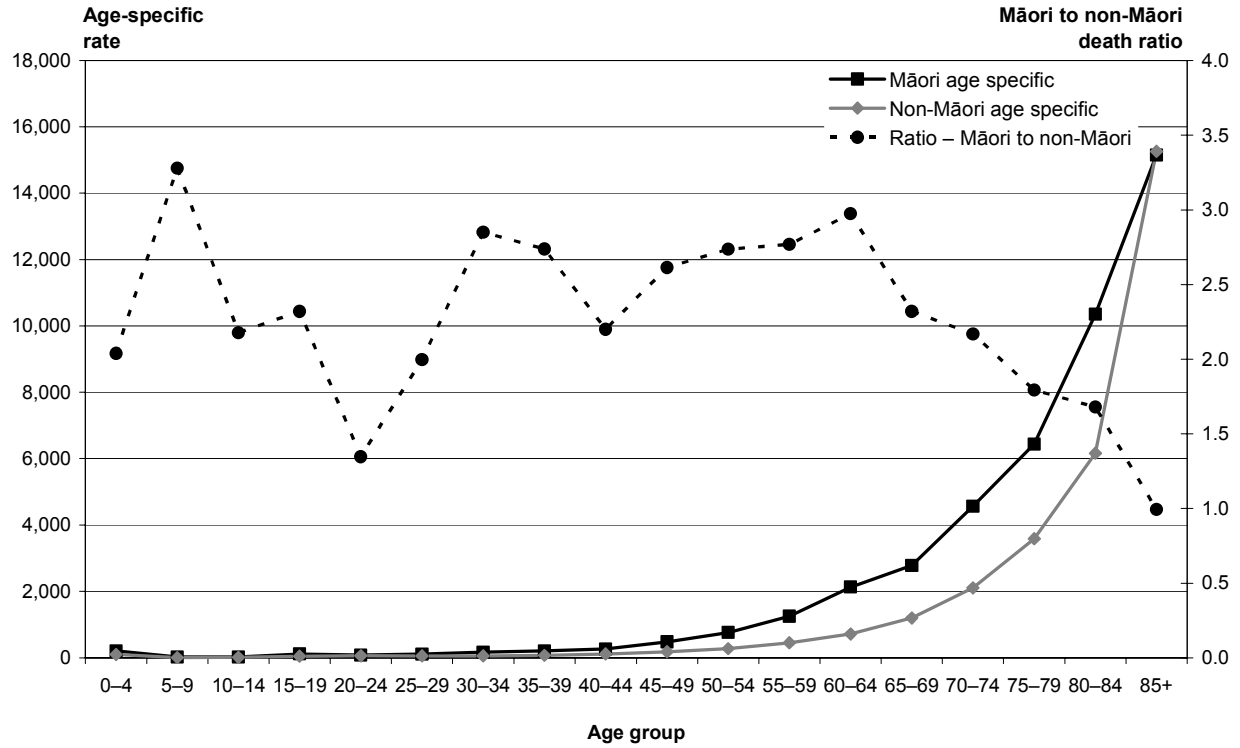
Cancer and ischaemic heart disease were the leading causes of death for this period. In 2006, cancer accounted for 28.5 percent of deaths while ischaemic heart disease accounted for 20.8 percent.

The remaining three conditions in Figure 3 together accounted for 18.6 percent of mortality in 2006.

Note that Figure 3 is based on percentages. Therefore, as one cause of death becomes less important, others become relatively more important. For example, the rapid decline in ischaemic heart disease has resulted in cancer becoming the primary cause of mortality in Figure 3, even though the mortality rate for both conditions has declined over time.

Figure 4 shows the age-specific rates of death for Māori and non-Māori, by age group for 2006. The ratio of Māori to non-Māori death rates is also plotted.

Figure 4: Age at death – Māori versus non-Māori, rates and ratio, 2006



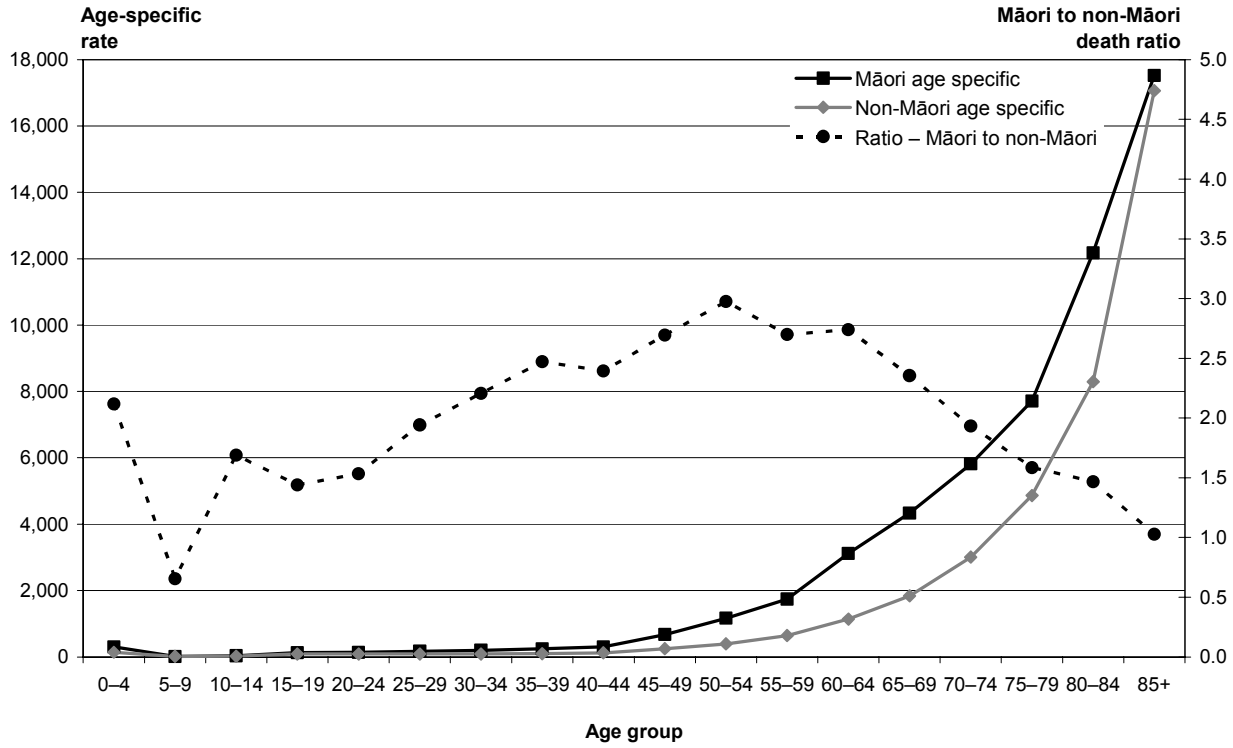
Māori had higher age-specific mortality rates than non-Māori for all age groups up to 84 years of age. The difference between the two sets of age-specific death rates is noticeably greater from the 45 to 49 year age group up to the 80 to 84 year age group.

The Māori to non-Māori death ratio, or relative risk ratio, shows the extent of the disparity between the Māori and non-Māori age-specific death rates.

The relative risk ratio for Māori is consistently high across all age groups (except for the 85 and over group). Across these age groups, the age-specific death rate within the Māori population was 1.3 to 3.3 times greater than that of non-Māori.

Figure 5 shows the equivalent data for Figure 4 for 1996.

Figure 5: Age at death – Māori versus non-Māori, rates and ratio, 1996



A comparison of the 1996 and 2006 data suggests than the death rate for both ethnicities from around 40 years to 84 years has declined by a broadly similar amount. The volatility of the relative risk ratio in the younger age groups is affected by the lower underlying figures it is based on.

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 2006.

Table 3: Age-standardised death rates for selected causes, by sex and ethnicity, 2006

	Cause of death	Total population			Māori population			Non-Māori population		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
C00–C96, D45–D47	Total cancer	132.3	151.2	118.5	217.3	227.2	212.3	125.7	145.7	110.7
C33–C34	Lung cancer*	24.7	29.2	21.2	63.8	63.8	64.7	21.8	26.6	17.8
C18–C21	Colorectal cancer†	18.9	20.4	17.4	17.7	19.5	16.8	19.0	20.6	17.4
C50	Breast cancer	10.8	0.2	20.3	19.4	0.0	35.6	10.1	0.2	19.0
C61	Prostate cancer	8.2	19.4	...	13.1	30.9	...	7.9	18.8	...
C16	Stomach cancer	4.6	5.9	3.4	12.3	17.1	8.6	3.9	5.1	2.9
C53	Cervical cancer	0.9	...	1.7	2.3	...	4.4	0.8	...	1.4
I20–I25	Ischaemic heart disease	82.3	110.7	58.5	164.9	221.7	115.6	76.3	102.3	54.7
I60–I69	Cerebrovascular disease	35.7	34.5	35.7	42.6	36.1	46.5	34.7	33.9	34.6
J40–47	Chronic lower respiratory diseases	24.7	29.7	21.6	53.0	50.6	55.3	21.3	26.2	18.0
J44	COPD‡	21.1	26.3	17.8	43.1	42.2	43.8	19.5	25.1	16.0
I30–I52	Other forms of heart disease§	15.6	18.9	12.9	27.5	38.7	16.9	14.5	17.0	12.4
E10–E14	Diabetes mellitus	13.4	16.1	11.2	54.3	70.4	40.7	10.6	12.4	9.2
X60–X84	Intentional self-harm	12.3	18.6	6.3	18.0	25.9	10.7	11.0	17.0	5.3
V01–V99	Transport accidents	10.2	15.4	5.5	22.3	32.5	13.6	8.1	12.6	3.8
F00–F09	Organic, including symptomatic, mental disorders	9.1	8.7	9.2	8.3	11.0	7.2	9.1	8.7	9.2
J10–J18	Pneumonia and influenza	6.0	6.2	5.7	5.5	6.9	4.3	5.9	6.0	5.7
I10–I15	Hypertensive disease	4.4	4.4	4.1	17.3	21.9	12.6	3.7	3.4	3.7
I05–I09	Chronic rheumatic heart disease	2.9	2.9	2.8	7.1	6.1	7.8	2.5	2.6	2.3
X85–Y09	Assault	1.6	2.1	1.2	4.7	5.7	3.9	1.0	1.4	0.6
	All causes of death	434.3	517.3	364.3	769.7	896.8	658.9	404.1	483.2	337.8

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

* Includes cancer of the trachea, bronchus and lung.

† Includes cancer of the colon, rectosigmoid junction, rectum, anus, and anal canal.

‡ Chronic obstructive pulmonary disease.

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

... = not applicable.

The highest age-standardised rates of death in the total population in 2006 were from:

- cancer
- ischaemic heart disease
- cerebrovascular disease.

The highest age-standardised rates of death in the Māori population in 2006 were from:

- cancer
- ischaemic heart disease
- diabetes mellitus.

Lung cancer was the leading cause of cancer death by age-standardised rate for both Māori and non-Māori in 2006.

Sex-based differences in mortality

Table 3 shows that male mortality rates were generally higher than female mortality rates. For example, in 2006 males had:

- an age-standardised death rate for all causes that was nearly 1½ times the female rate
- nearly twice the female age-standardised death rate for ischaemic heart disease
- more than 2½ times the female rate of transport accidents
- three times the female rate of intentional self-harm.

Ethnicity-based differences in mortality

Māori had a higher age-standardised rate of death than non-Māori for most of the causes shown in Table 3, but had a lower mortality rate for colorectal cancer, organic mental disorders and pneumonia.

In 2006, the calculated Māori age-standardised rate of death from all causes of death was 1.9 times that of the non-Māori rate.

In 2006, the two largest differences between Māori and non-Māori age-standardised mortality rates were:

- diabetes mellitus, where the Māori rate was nearly 4.7 times higher than the non-Māori rate (age-standardised rate of 49.9 for Māori versus 10.7 for non-Māori)
- hypertensive disease, where the Māori rate was 5.1 times higher than the non-Māori rate (age-standardised rate of 17.3 for Māori versus 3.7 for non-Māori).

Further, in 2006, Māori had at least double the non-Māori age-standardised rate for:

- lung cancer
- stomach cancer
- chronic obstructive pulmonary disease (COPD)
- transport accidents

- hypertensive disease
- chronic rheumatic heart disease
- assault.

Note that the percentages and rates discussed are a snapshot from 2006. Māori mortality rates tend to vary more widely than those of non-Māori. Thus, it is appropriate, wherever possible, to examine the pattern of their incidence over several years. This helps determine, for example, whether the mortality figures for a particular year are a statistical spike or representative of the general trend for that condition.

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

Mortality by District Health Board

This section presents mortality data by District Health Board (DHB) by crude and age-standardised rate.

Population used

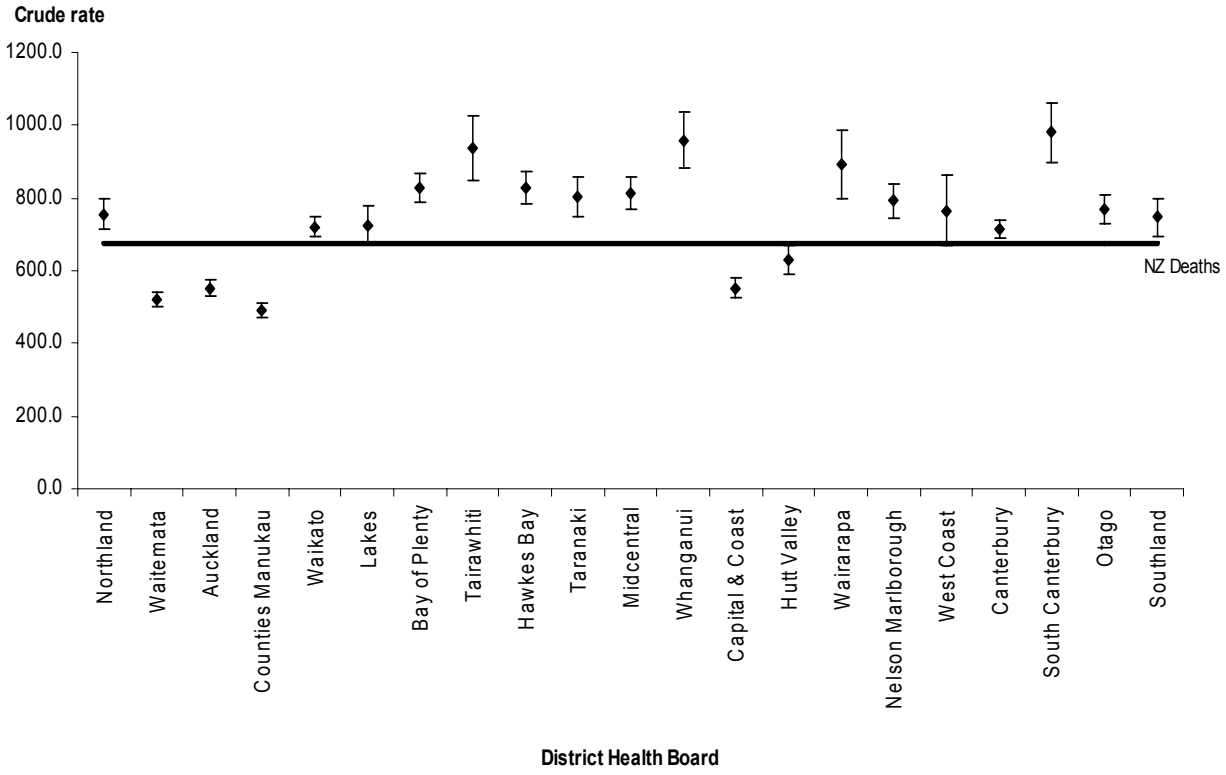
Population data by DHB is incomplete for the period covered. Populations for the year as at 31 December were produced by averaging two 30 June populations. Māori regional populations are not available outside the census years. The Māori population for the years between the census year data points has been estimated using linear interpolation.

This means that the populations used in this section differ slightly from those in the rest of *Mortality and Demographic Data 2006*.

Total population

Figure 6 shows the crude rates of death by DHB, and the rate for all of New Zealand. A crude (or unadjusted) rate shows the actual (or true) mortality rate of a population. However, the disadvantage of a crude rate is that it has limited comparability with other crude rates (because of the different populations the rates are based on).

Figure 6: Death rates by DHB, total population, crude rates, 2006



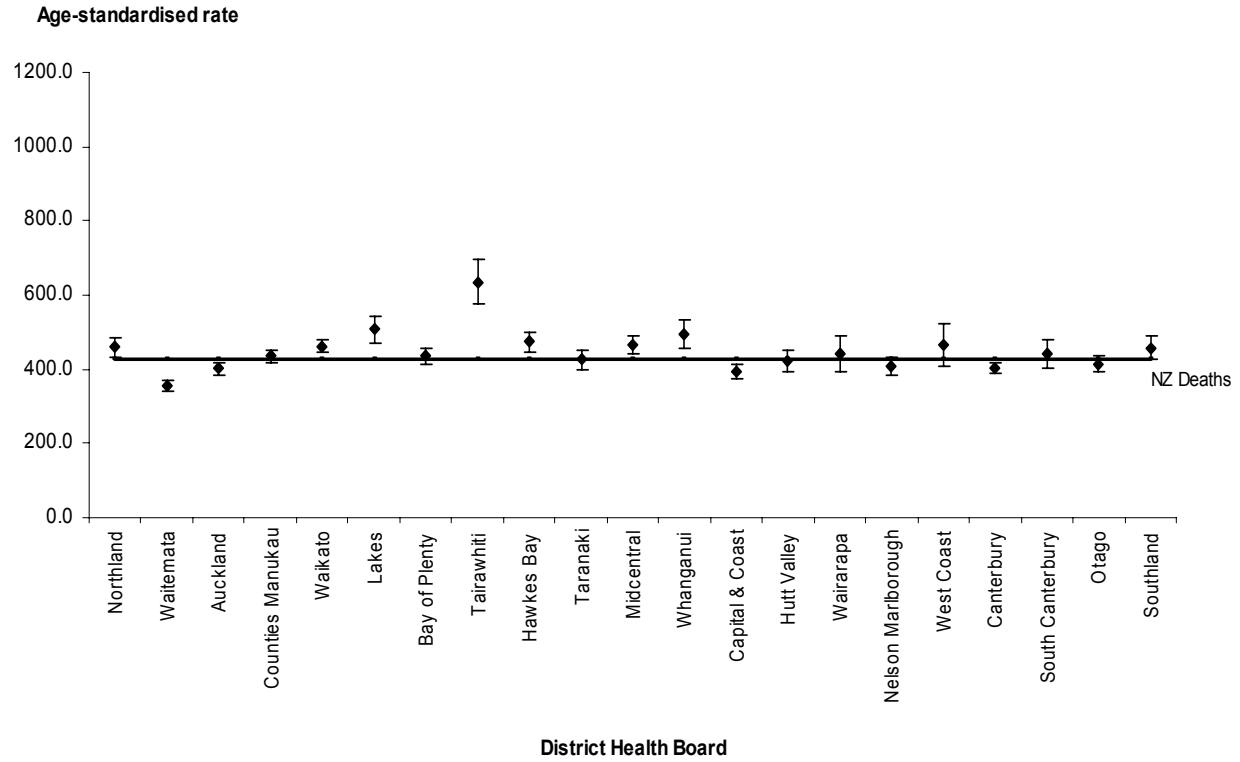
The crude rates for the total population show considerable variance from the New Zealand norm, with 18 of the DHBs having a rate that is probably significantly different from the New Zealand norm. However, how much of this variance is due to a particular DHB having an older/younger population cannot be determined.

An age-standardised death rate adjusts 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 (see Statistical Notes in the Explanatory Notes section). This population is a widely used New Zealand and international standard.

Controlling for differing population ages (Figure 7), eight DHBs had a mortality rate that was likely to be significantly different from the New Zealand norm (six were higher, four lower).

Figure 7: Death rates by DHB, total population, age-standardised rates, 2006



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

The DHB with the highest rate of age-standardised death for the total population was Tairawhiti (633.9; n=431), with Lakes second highest (506.7; n=736).

The DHB with the lowest rate of age-standardised death for the total population was Waitemata (356.7; n=2645).

Māori population

Figures 8 and 9 show the crude and age-standardised rate of deaths respectively by DHB for Māori.

Figure 8: Death rates by DHB, Māori population, crude rates, 2006

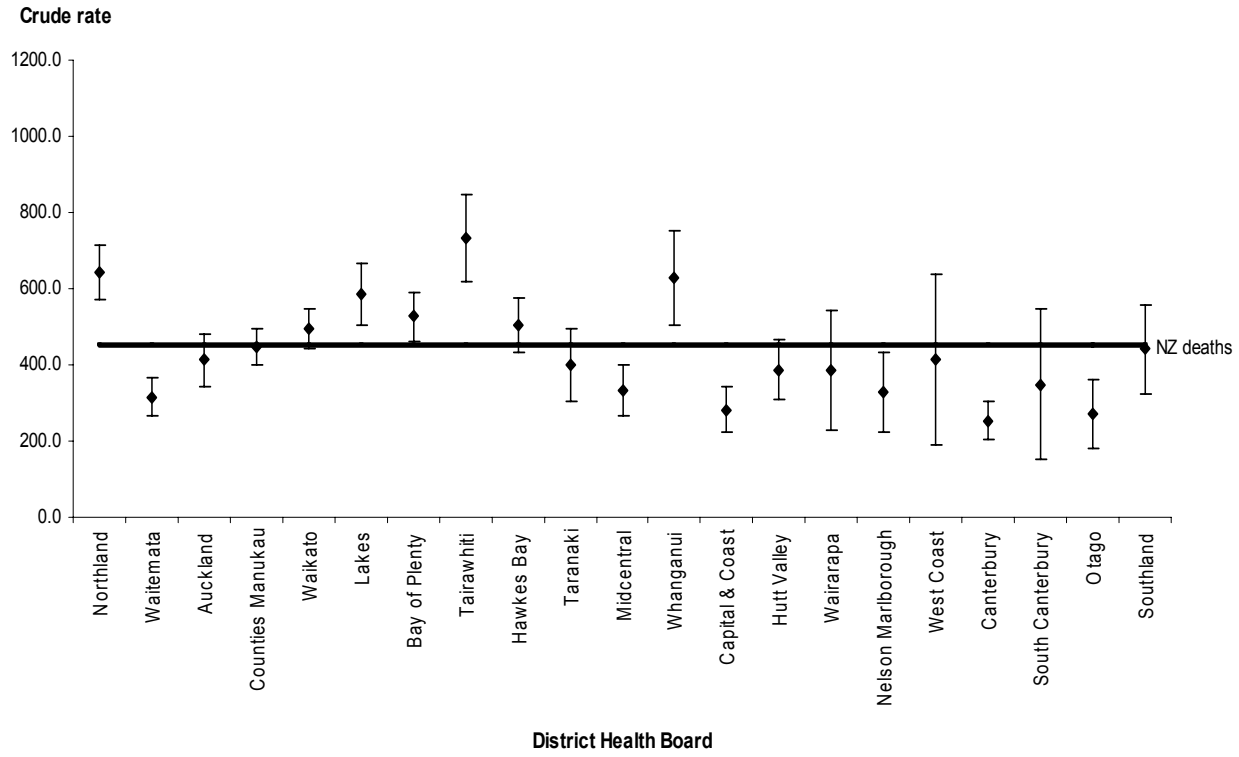
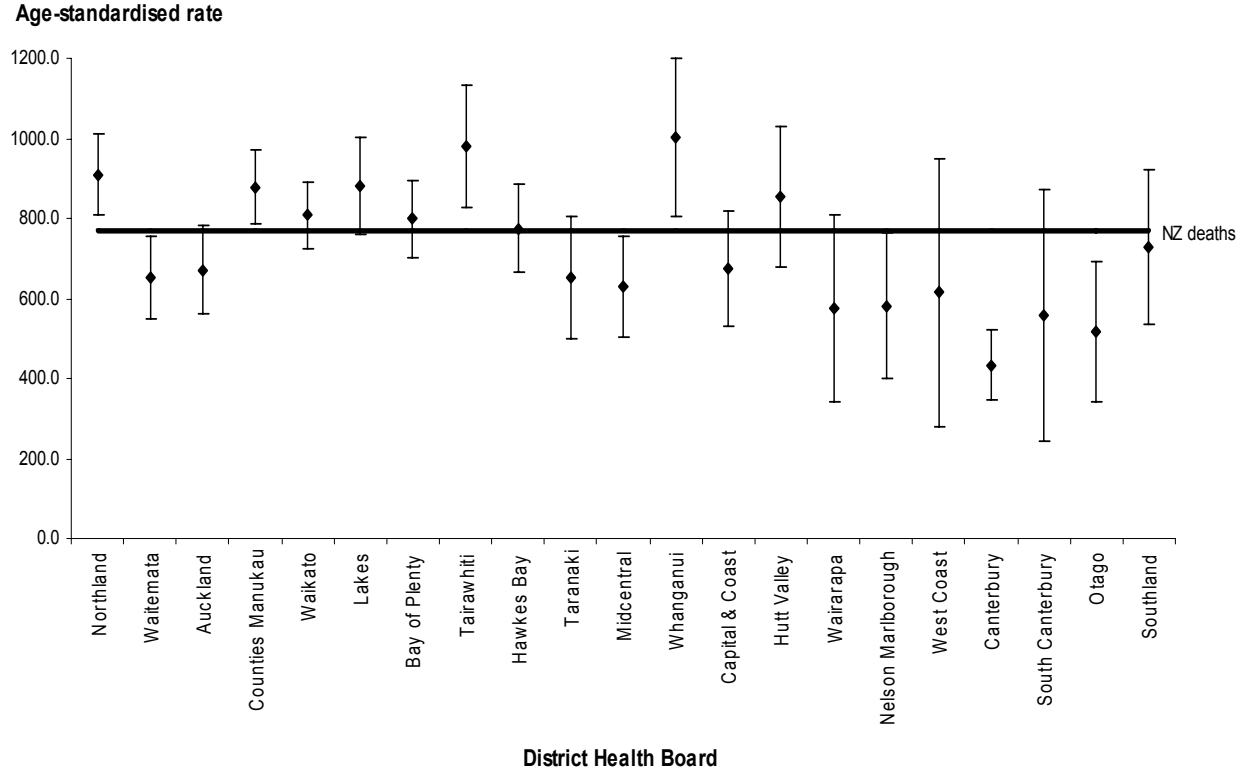


Figure 9: Death rates by DHB, Māori population, age-standardised rates, 2006



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

Overall, four DHBs had an age-standardised Māori mortality rate that was likely to be significantly higher than the national average, and five were likely to be significantly lower. The highest age-standardised rates of death were Whanganui (1000.5; n=98) and Tairawhiti (979.8; n=158).

Due to low mortality numbers, rates for Wairarapa (n=23), West Coast (n=13) and South Canterbury (n=12) have very wide confidence intervals. Rates for these two DHBs should be interpreted with caution.

The lowest Māori age-standardised rate of death was Canterbury (432.7; n=93).

Selected Trends

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

Please note the following:

- Because of changes in ethnicity recording 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, 1996–2006) than those for the total population (see Ethnicity notes in the Explanatory notes section).
- All age-standardised rates presented here use WHO World Standard Population and represent deaths per 100,000 population (see Population notes in the Explanatory notes section).

Conditions covered in this section are:

- cancer (malignant neoplasm)
- lung cancer (malignant neoplasm of the trachea, bronchus and lung)
- female breast cancer (malignant neoplasm of female breast)
- prostate cancer (malignant neoplasm of prostate)
- cervical cancer (malignant neoplasm of the cervix uteri)
- melanoma of the skin (malignant melanoma of skin)
- ischaemic heart diseases (angina pectoris, myocardial infarction, other forms of acute and chronic ischaemic heart disease)
- cerebrovascular diseases (cerebral haemorrhage (subarachnoid, intracerebral, and other non-traumatic), cerebral infarction, occlusion and stenosis of precerebral and cerebral arteries, other cerebrovascular diseases)
- diabetes mellitus: insulin dependent (type 1), and non-insulin dependent (type 2).

Cancer (C00–C96, D45–D47)

Cancer, or malignant neoplasm, is a general term that covers a large number of diseases. This section is concerned with the aggregate mortality impacts of malignant neoplasms (a neoplasm is an abnormal growth of tissue, which may prove to be benign or malignant). Collectively, malignant neoplasms are a major cause of mortality in the New Zealand population.

In line with the third edition of the *International Classification of Diseases for Oncology (ICD-O)*, the range of neoplasms considered to be malignant has been expanded. Specifically, the 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 new malignancies are in the range D45–D47. This change took effect from 2003.[1]

Mortality and Demographic Data 2004 was the first publication in this series to include the D45–D47 code range in cancer. The addition of these codes means the figures presented in this section for the years 2003 onward will not be directly comparable with those in previous publications in the Mortality and Demographic Data series.

There were 8094 deaths from cancer in 2006 (4144 males and 3950 females).

Table 4 shows the number and age-standardised rate of cancer deaths from 1987 to 2006, while Figure 10 shows age-standardised death rates over the same period. Cancer was the leading cause of death for both males and females in 2006.

The age-standardised rate of cancer death has shown a downward trend from 1987 to 2006, with a 23.8 percent decrease for males and a 17.9 percent decrease for females over the period. Males had a consistently higher age-standardised rate of cancer death over this time, and in 2006 the male rate was 27.7 percent higher than the female rate.

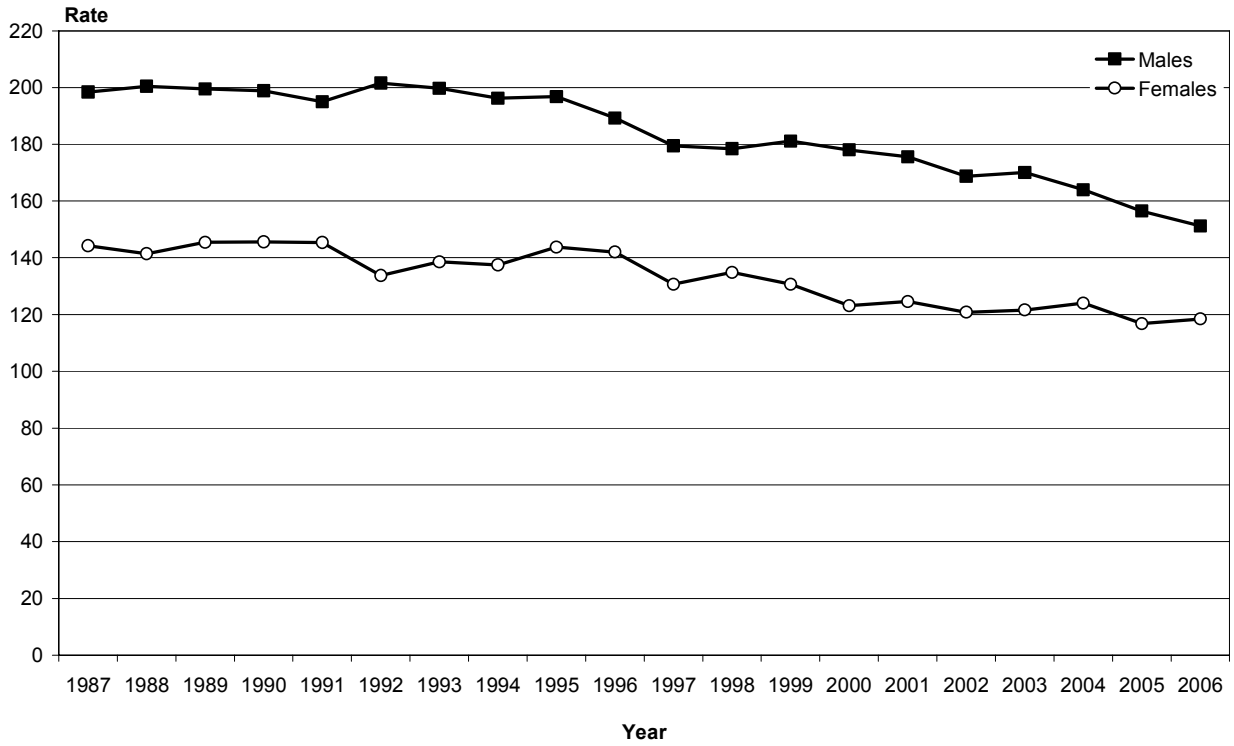
Table 4: Numbers and age-standardised death rates from cancer, by sex, 1987–2006

Year	Males		Females	
	No.	Rate	No.	Rate
1987	3375	198.4	3035	144.2
1988	3444	200.5	3037	141.5
1989	3492	199.5	3139	145.5
1990	3548	198.9	3198	145.7
1991	3541	195.0	3251	145.4
1992	3771	201.6	3110	133.8
1993	3812	199.8	3282	138.6
1994	3834	196.2	3332	137.5
1995	3918	196.8	3504	143.8
1996	3872	189.2	3589	142.0
1997	3834	179.5	3448	130.7
1998	3911	178.4	3671	134.8
1999	4063	181.2	3611	130.7
2000	4120	178.0	3500	123.1
2001	4166	175.6	3644	124.6
2002	4125	168.8	3675	120.9
2003	4292	170.0	3735	121.7
2004	4246	164.0	3899	124.0
2005	4184	156.5	3787	116.8
2006	4144	151.2	3950	118.5

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

[1] For further information see: Cancer: New Registrations and Deaths 2003 (http://www.nzhis.govt.nz/moh.nsf/pagesns/501).

Figure 10: Death rates from cancer, by sex, 1987–2006



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

Table 5 shows cancer death percentages for four age groupings for Māori and non-Māori.

Table 5: Percentage distribution of deaths from cancer, by age, ethnicity and sex, 2006

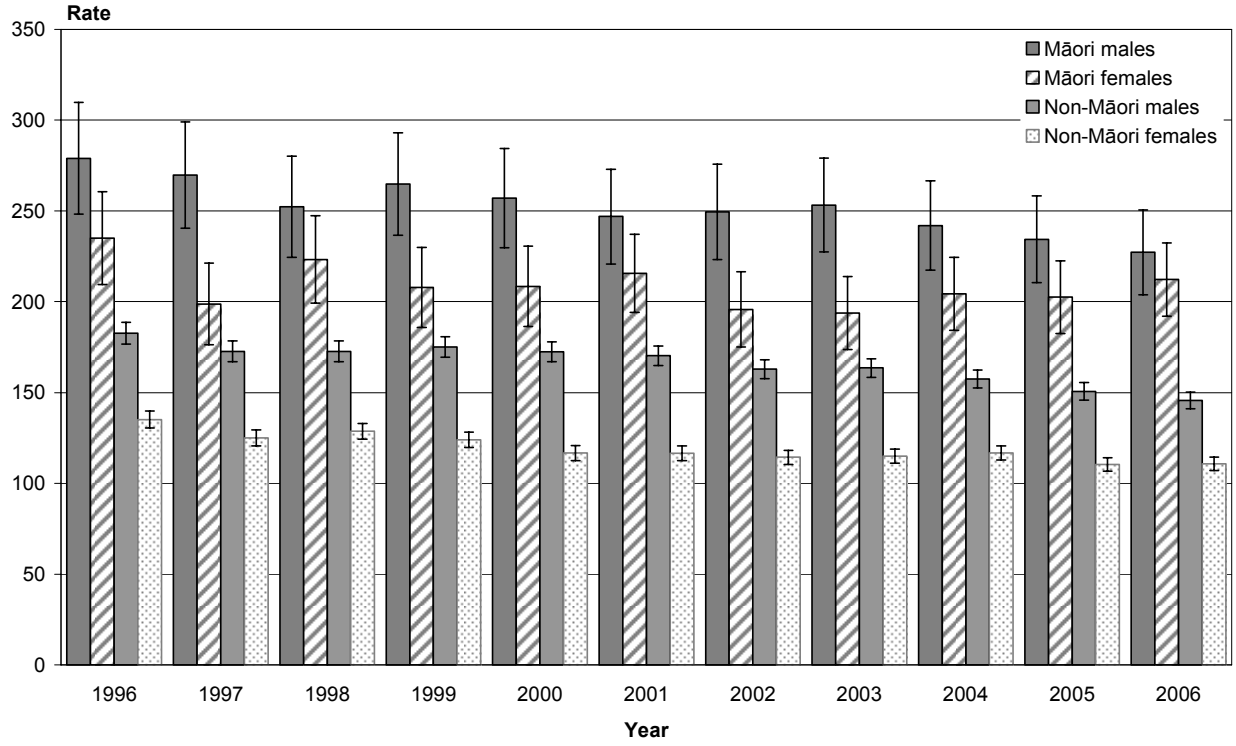
	Māori			Non-Māori		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**
<25	2.0	3.0	1.2	0.6	0.7	0.5
25–44	7.8	6.9	8.7	2.9	2.3	3.6
45–64	43.9	41.5	46.0	22.0	21.3	22.6
65+	46.2	48.6	44.1	74.5	75.6	73.3

The distribution is skewed toward the 65 years and over age group. However, a large proportion of cancer-related deaths also occurred in the 45 to 64 age band. Below this level cancer deaths are relatively rare. Māori had a greater proportion of deaths occurring in the younger age groups than non-Māori.

Māori had a greater proportion of deaths occurring in the 45 to 64 year age group (almost twice that of non-Māori). In the 65 years and over age group the non-Māori percentage of deaths was more than one and a half times higher than that of Māori.

Figure 11 shows cancer age-standardised mortality rates by sex and ethnicity for the years 1996 to 2006.

Figure 11: Death rates from cancer, by sex and ethnicity, 1996–2006



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

The Māori population had a consistently higher rate of cancer death than the non-Māori population, and Māori males had a higher rate than Māori females.

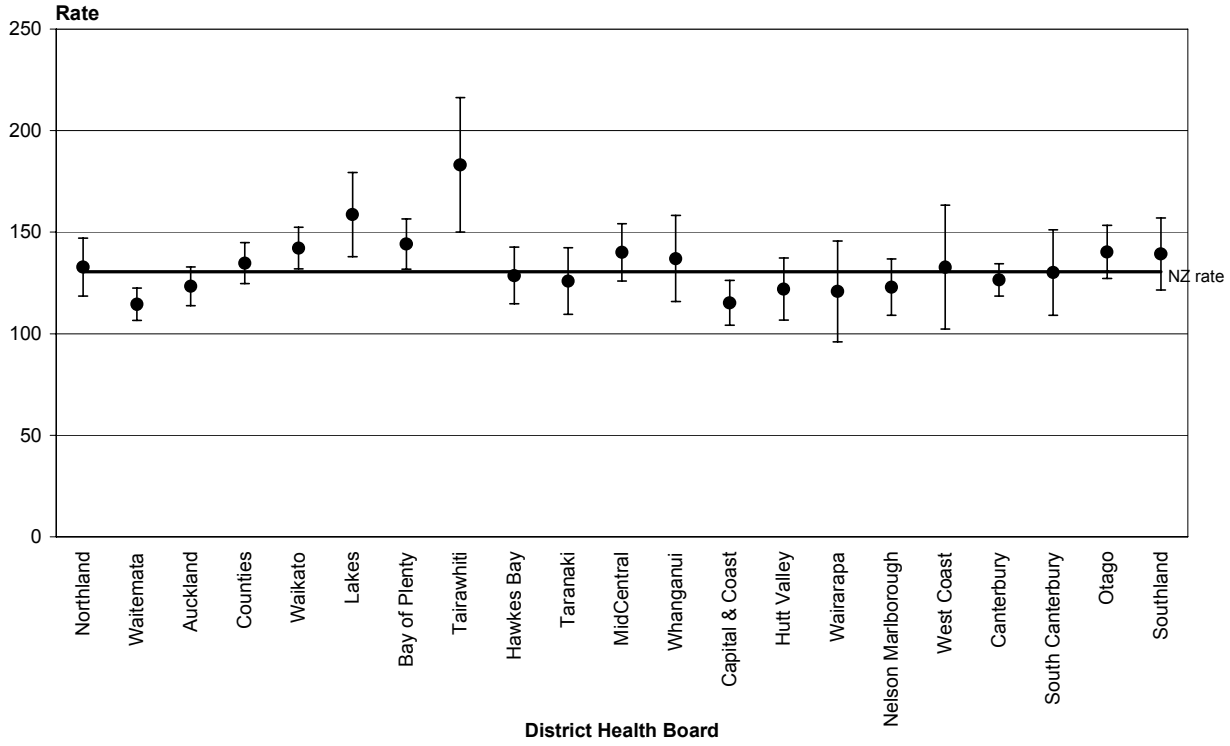
In 2006, the calculated Māori male rate was 56.0 percent higher than the non-Māori male rate.

Māori females had a calculated rate of cancer death that was 91.7 percent higher than the non-Māori female rate in 2006.

The error bars around the death rates for non-Māori males and females indicate that the rate decreased significantly over the 1996 to 2006 period.

Figure 12 shows age-standardised cancer death rates by DHB for the total population in 2006.

Figure 12: Cancer death rates by DHB, total population, age-standardised rates, 2006



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

Overall, most DHBs were consistent with the New Zealand death rate for cancer. Two DHBs (Lakes and Tairawhiti) were probably above the New Zealand rate, and two DHBs (Waitemata and Capital and Coast) were probably lower.

Trachea, bronchus and lung cancer (C33–C34)

This section includes 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 one of the leading causes of cancer death and accounted for 18.0 percent of cancer deaths in 2006 (1457 deaths). The majority of those who died from lung cancer were males (54.8 percent in 2006).

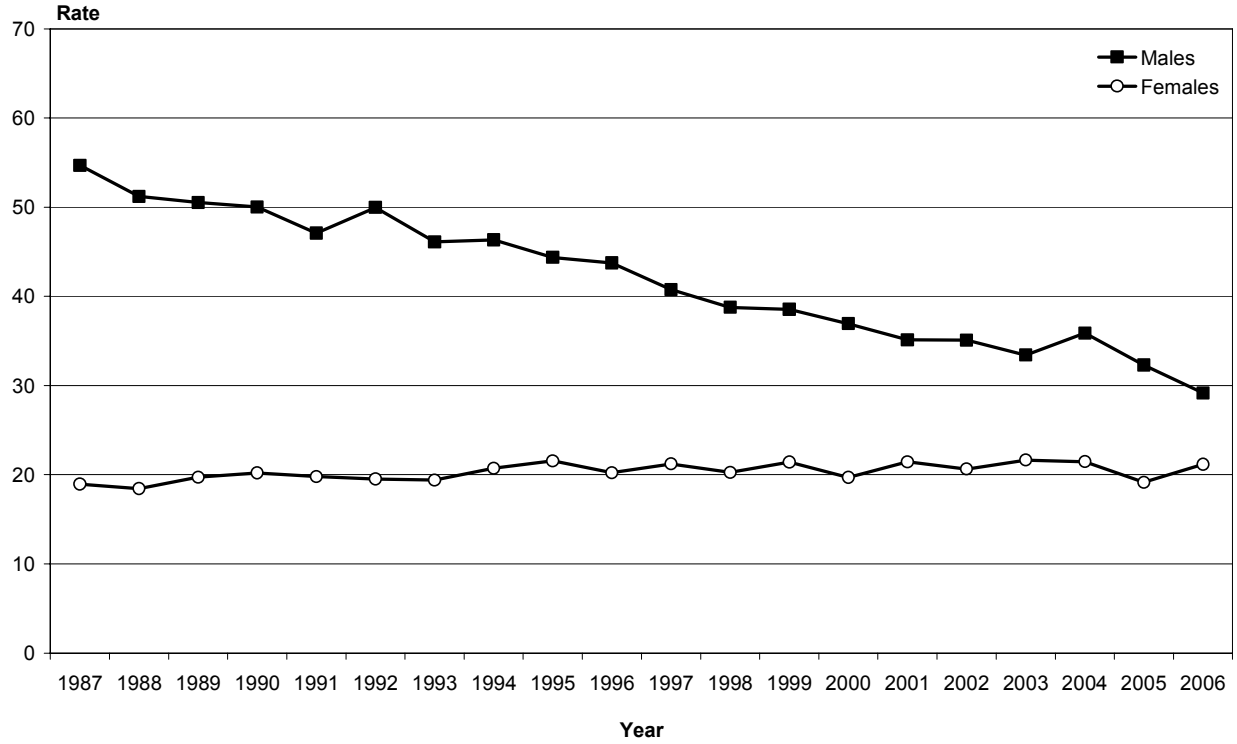
Table 6 and Figure 13 show deaths from lung cancer from 1987 to 2006. The male age-standardised death rate decreased by 46.7 percent over this period while the female rate increased by 11.7 percent.

Table 6: Numbers and age-standardised death rates from lung cancer, by sex, 1987–2006

Year	Males		Females	
	No.	Rate	No.	Rate
1987	950	54.7	396	18.9
1988	892	51.2	395	18.4
1989	896	50.5	411	19.7
1990	903	50.0	433	20.2
1991	869	47.1	427	19.8
1992	947	50.0	445	19.5
1993	892	46.1	444	19.4
1994	919	46.3	484	20.7
1995	892	44.4	514	21.6
1996	904	43.7	502	20.2
1997	882	40.8	530	21.2
1998	855	38.8	526	20.2
1999	874	38.6	569	21.4
2000	860	36.9	546	19.7
2001	841	35.1	594	21.4
2002	866	35.1	605	20.7
2003	848	33.4	618	21.6
2004	929	35.9	626	21.5
2005	864	32.3	587	19.2
2006	798	29.2	659	21.2

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

Figure 13: Death rates from lung cancer, by sex, 1987–2006



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

Table 7 shows lung cancer death percentages for four age groupings for Māori and non-Māori.

Table 7: Percentage distribution of deaths from lung cancer, by age, sex and ethnicity, 2006

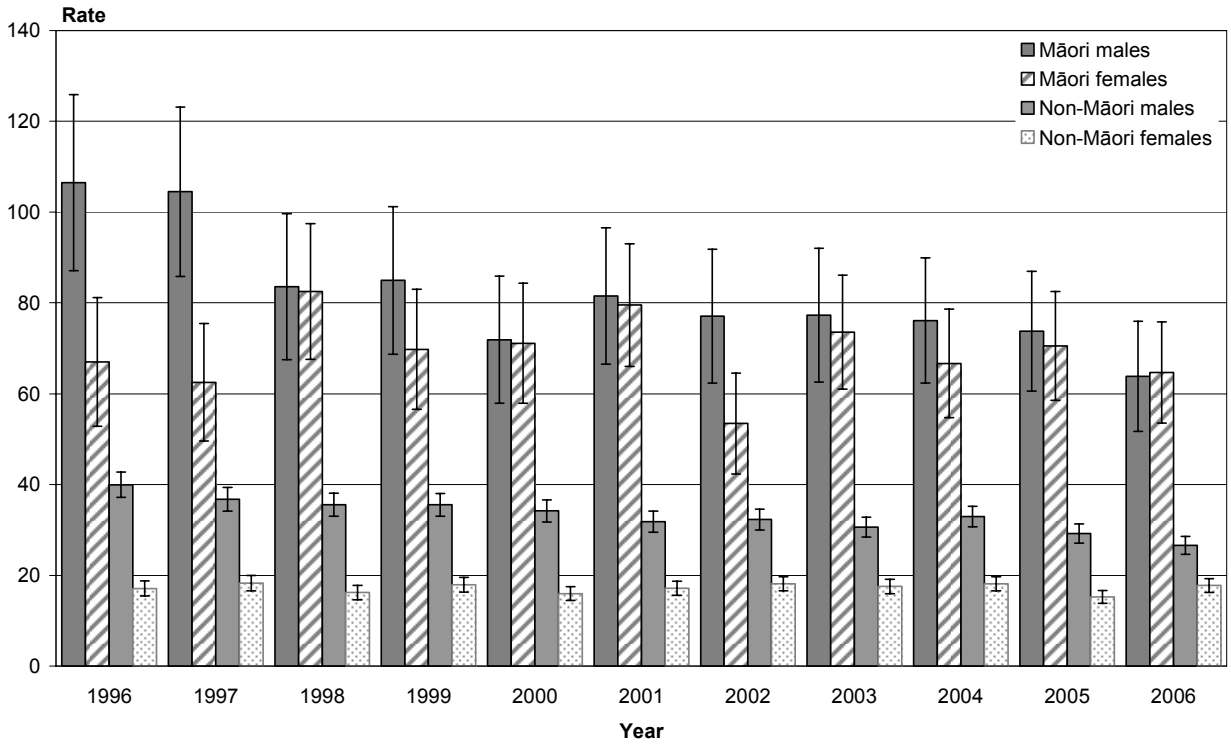
	Māori			Non-Māori		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**
<25	0.0	0.0	0.0	0.1	0.0	0.2
25–44	2.6	2.8	2.3	1.2	0.6	2.1
45–64	54.5	53.8	55.0	25.5	24.4	26.8
65+	43.0	43.4	42.6	73.2	75.0	70.9

The age distribution is similar to that of cancer deaths as a whole, with the great majority of deaths at age 45 and above.

Māori had a greater proportion of deaths occurring in the 45 to 64 year age group (over twice that of non-Māori). In the 65 years and over age group the non-Māori percentage of deaths was over 1½ times higher than that of Māori.

Lung cancer age-standardised death rates by sex and ethnicity are shown in Figure 14.

Figure 14: Death rates from lung cancer by sex and ethnicity, 1996–2006



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

Of the four population groups presented, Māori males had the highest rate of lung cancer death from 1996 to 2006. However, since 1998 the calculated Māori male lung cancer rate has not been significantly different from that of Māori females.

The calculated lung cancer age-standardised mortality rate of Māori females in 2006 was comparable with that of 1996, while the Māori male rate decreased significantly (by 40.1 percent). This represents a decrease in the actual number of deaths from 116 to 106 deaths for Māori males, and an increase from 86 to 129 deaths for Māori females.

The calculated Māori male age-standardised rate of lung cancer death was 140 percent higher than the non-Māori male population in 2006.

The calculated Māori female age-standardised rate of lung cancer death was 264 percent higher than the equivalent non-Māori population in 2006. The Māori female rate varied noticeably, with a pronounced drop in 2002 (the lowest in the period covered).

Overall, the gender difference in lung cancer rates for non-Māori is greater than that for Māori. This non-Māori gender difference in lung cancer rates is reducing over time.

Female breast cancer (C50)

Breast cancer, or malignant neoplasm of breast, was the second leading cause of cancer death for females in 2006 after lung cancer.[2] National breast screening commenced at the end of 1998 for women aged from 50 to 69 years; from July 2006 the minimum screening age was lowered to 45 years of age.[3]

A total of 614 females died from breast cancer in 2006 and this accounted for 15.5 percent of female deaths from cancer.

Table 8 and Figure 15 show the numbers and age-standardised rates of female deaths from breast cancer from 1987 to 2006. While the actual number of deaths increased slightly, the breast cancer mortality rate decreased by 35.5 percent from 1987 to 2006.

Table 8: Numbers and age-standardised death rates from breast cancer in females, 1987–2006

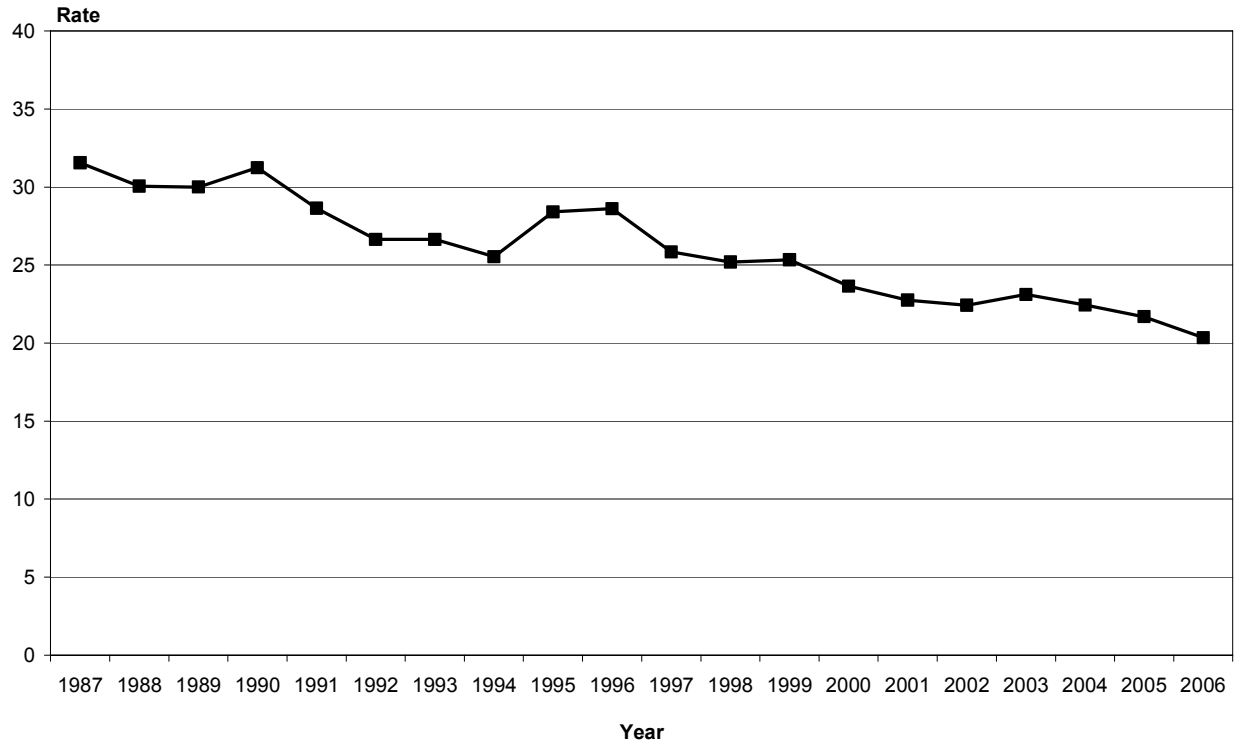
Year	No.	Rate
1987	607	31.5
1988	593	30.0
1989	605	30.0
1990	635	31.2
1991	588	28.6
1992	569	26.6
1993	584	26.6
1994	567	25.5
1995	638	28.4
1996	681	28.6
1997	620	25.8
1998	629	25.2
1999	647	25.3
2000	622	23.6
2001	615	22.7
2002	625	22.4
2003	647	23.1
2004	642	22.4
2005	648	21.7
2006	614	20.3

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

[2] Note that this section discusses cancer of the female breast; breast cancer can occur in males, but this is rare.

[3] For further information on the BreastScreen Aotearoa programme, see: http://www.nsu.govt.nz/.

Figure 15: Death rates from breast cancer in females, 1987–2006



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

There were also five male deaths from breast cancer, giving an age-standardised rate of 0.2 deaths per 100,000 male population.

Table 9 shows the percentage distribution of deaths from breast cancer in females for four age groupings for Māori and non-Māori.

Table 9: Percentage distribution of deaths from breast cancer in females, by age and ethnicity, 2006

	Māori female	Non-Māori female
<25	0.0	0.2
25–44	15.6	8.0
45–64	50.6	35.0
65+	33.8	56.8

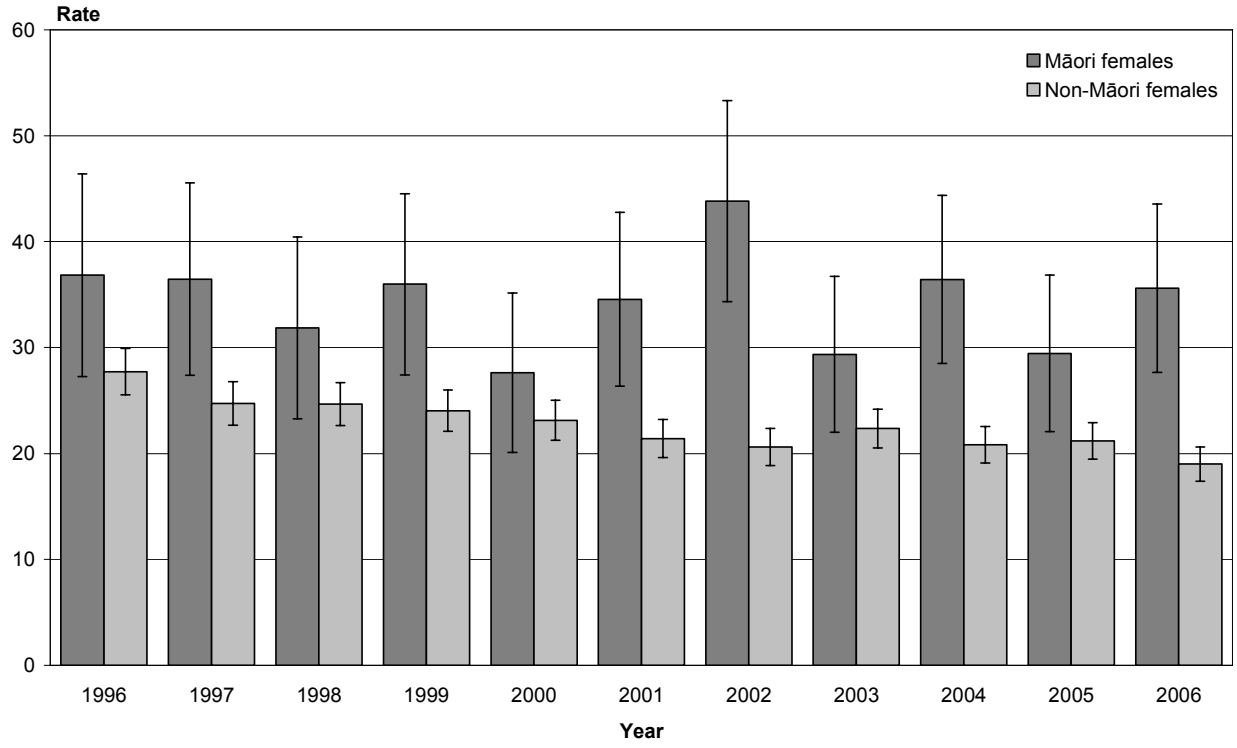
Over half of the deaths in the total population from female breast cancer in 2006 occurred in the 65 and over age group (53.6 percent).

For Maori and non-Maori females in the younger age groups (ie, 25 to 44 and 45 to 64) the proportion of deaths from breast cancer was greater than that of cancer deaths as a whole (Table 5).

The percentage of Māori deaths in the 25 to 44 group was greater than non-Māori (nearly twice as many).

Figure 16 shows breast cancer age-standardised mortality rates by ethnicity for 1996 to 2006.

Figure 16: Death rates from breast cancer in females, by ethnicity, 1996–2006



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

In 2006, Māori females had a calculated age-standardised breast cancer mortality rate that was 87.4 percent higher than the non-Māori female rate.

From 1996 to 2006, the non-Māori rate of female breast cancer declined significantly (as demonstrated by the confidence intervals). However, the trend from 2002 onward has been relatively flat.

The Māori age-standardised rate shows greater variability than that of non-Māori; this variance may be partially explained by the lower Māori sample size (2006 Māori n=77). The wide confidence intervals attached to the Māori figures highlight this issue.

Prostate cancer (C61)

Prostate cancer, or malignant neoplasm of prostate, is one of the leading causes of male cancer registrations,[4] and, in 2006, was also one of the leading causes of male cancer death.

There were 559 deaths from prostate cancer in 2006 (an age-standardised rate of 19.4 deaths per 100,000 male population), accounting for 13.5 percent of male cancer deaths.

Table 10 and Figure 17 show numbers and age-standardised mortality rates from prostate cancer from 1987 to 2006.

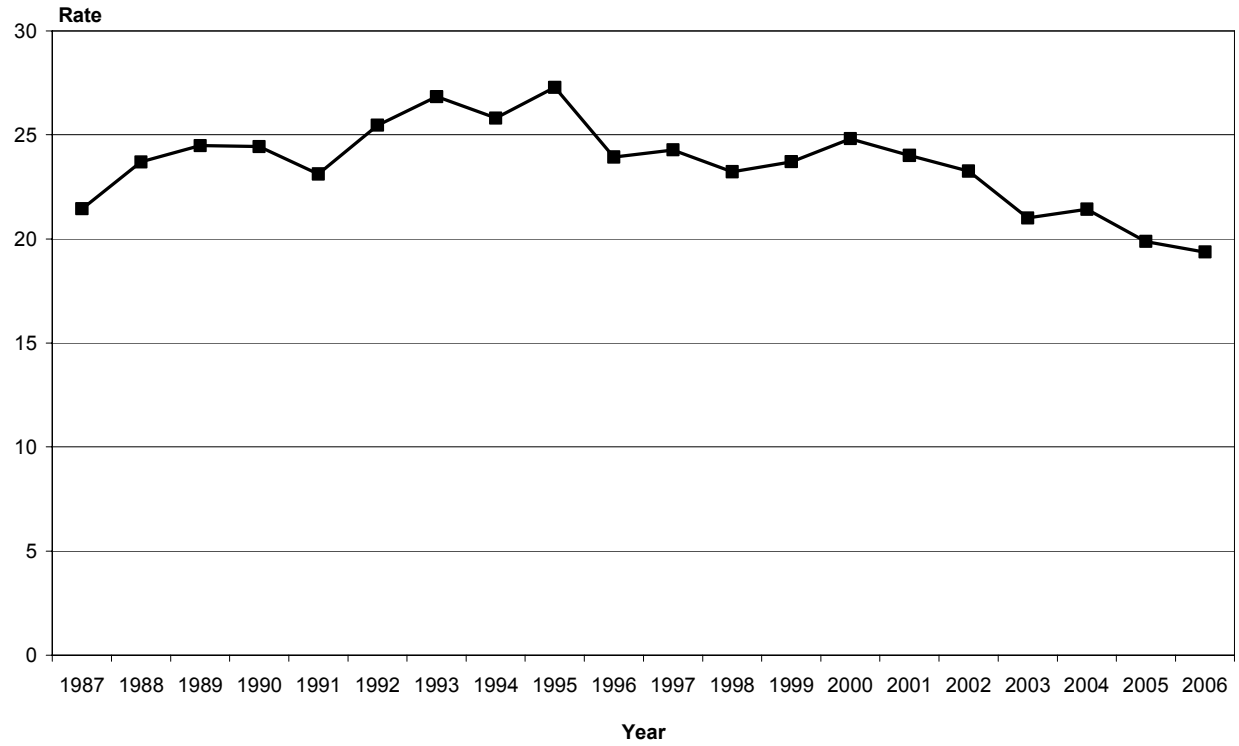
Table 10: Numbers and age-standardised death rates from prostate cancer, 1987–2006

Year	No.	Rate
1987	365	21.4
1988	402	23.7
1989	425	24.5
1990	436	24.4
1991	423	23.1
1992	478	25.5
1993	520	26.8
1994	517	25.8
1995	554	27.3
1996	502	23.9
1997	525	24.3
1998	524	23.2
1999	552	23.7
2000	594	24.8
2001	592	24.0
2002	591	23.3
2003	556	21.0
2004	583	21.4
2005	564	19.9
2006	559	19.4

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

[4] See the publication series Cancer: New registrations and deaths (http://www.nzhis.govt.nz/moh.nsf/pagesns/33#01).

Figure 17: Death rates from prostate cancer, 1987–2006



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

While prostate cancer death rates increased during the first half of the period covered, they have declined in more recent years. Overall, this has produced a small downward trend.

Table 11 shows prostate cancer death percentages for four age groupings.

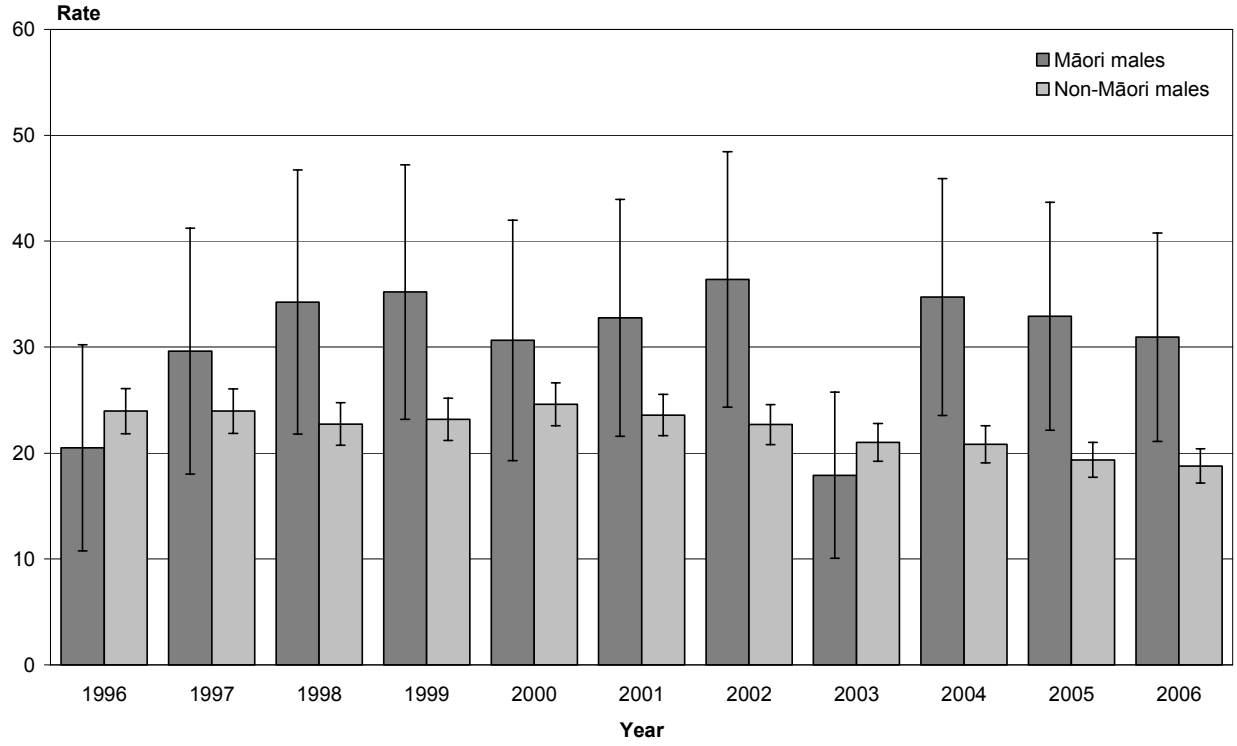
Table 11: Percentage distribution of deaths from prostate cancer, by age and ethnicity, 2006

	Māori male	Non-Māori male
<25	0.0	0.0
25–44	0.0	0.0
45–64	15.8	7.7
65+	84.2	92.3

Prostate cancer mortality in 2005 primarily occurred in the 65 and over age group. The distribution of deaths was skewed toward the older age group more than that for cancer deaths as a whole.

Figure 18 shows prostate cancer age-standardised death rates for Māori and non-Māori from 1996 to 2006.

Figure 18: Death rates from prostate cancer, by ethnicity, 1996–2006



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

The Māori age-standardised death rate calculated for 2006 was 65 percent higher than the non-Māori rate for that year.

The calculated age-standardised death rate for Māori in 2006 was 51 percent higher than the rate for 1996. Please note, however, that the confidence intervals for these two years overlap.

Note that the Māori numbers here are low (2006 n=38), and the error bars in Figure 18 reflect the large potential variance associated with such small totals (the unusually low numbers seen in 1996 and 2003 may be related to this issue). Rates and other calculations based on small totals must be interpreted with caution.

Malignant melanoma of the skin (C43)

While malignant melanoma of the skin is a common cause of cancer registration, it was not a leading cause of cancer death in 2006.[5] However, male mortality incidence from this condition has trended upward over the 1987 to 2006 period.

[5] See the publication series *Cancer: New Registrations and Deaths* (http://www.nzhis.govt.nz/moh.nsf/pagesns/33#01).

There were 287 deaths from malignant melanoma of the skin in 2006, representing 3.5 percent of total cancer deaths.

Māori accounted for only five of the 287 deaths from malignant melanoma in 2006. Ethnic group comparisons have not been made for melanoma mortality because of the small number of Māori deaths from malignant melanoma.

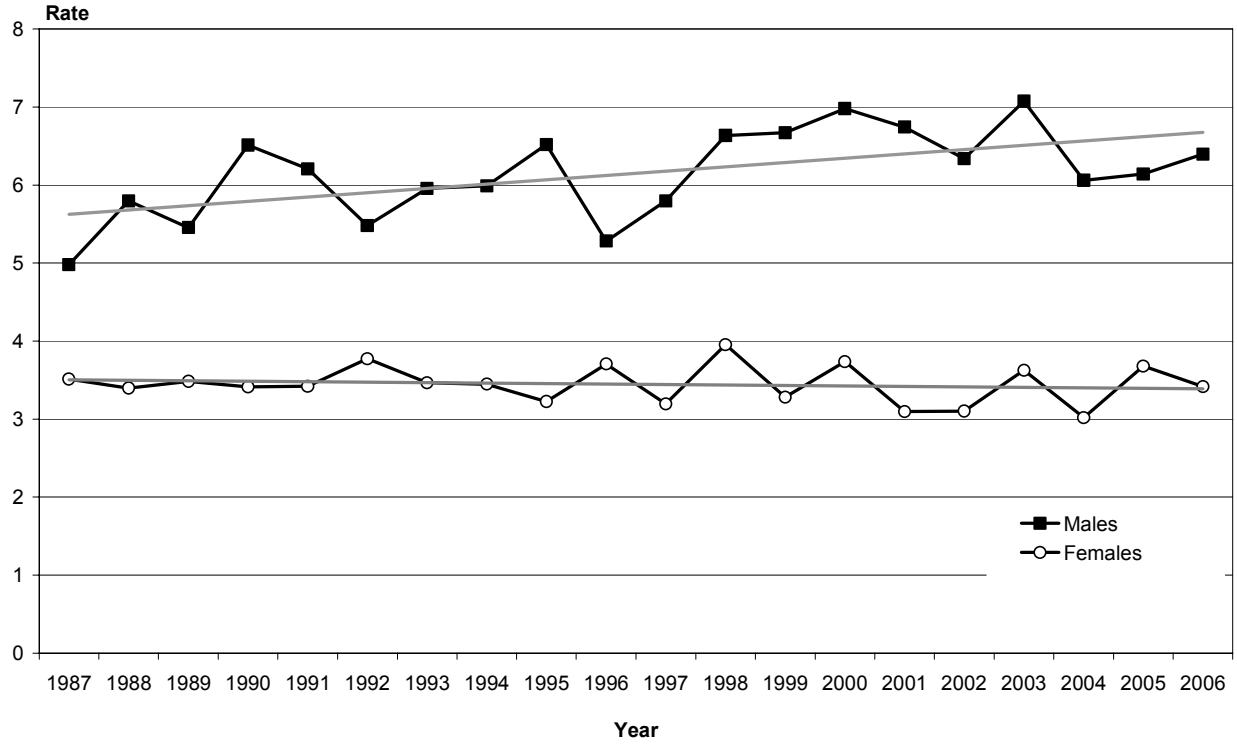
Table 12 and Figure 19 show numbers and age-standardised mortality rates for malignant melanoma of the skin from 1987 to 2006.

Table 12: Numbers and age-standardised death rates from malignant melanoma of the skin, by sex, 1987–2006

Year	Males		Females	
	No.	Rate	No.	Rate
1987	83	5.0	67	3.5
1988	101	5.8	69	3.4
1989	95	5.5	71	3.5
1990	115	6.5	73	3.4
1991	109	6.2	71	3.4
1992	99	5.5	83	3.8
1993	112	6.0	82	3.5
1994	114	6.0	79	3.4
1995	126	6.5	71	3.2
1996	107	5.3	87	3.7
1997	121	5.8	80	3.2
1998	143	6.6	105	4.0
1999	146	6.7	85	3.3
2000	155	7.0	98	3.7
2001	156	6.7	88	3.1
2002	149	6.3	86	3.1
2003	174	7.1	111	3.6
2004	152	6.1	97	3.0
2005	156	6.1	113	3.7
2006	173	6.4	114	3.4

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

Figure 19: Death rates from malignant melanoma of the skin, by sex, 1987–2006



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

The male age-standardised rate of death from malignant melanoma of the skin has shown an upward trend from 1987 to 2006, with a 28.5 percent increase over this period. The female age-standardised rate decreased by 2.7 percent from 1987 to 2006. However, the female trend, as a whole, has remained relatively flat, oscillating around 3½ deaths per 100,000 females over the period covered. Linear trend lines are shown on Figure 19 to illustrate the male and female trends.

Males had a consistently higher age-standardised rate of death from malignant melanoma of the skin over this time, and in 2006 the male rate was nearly two times the female rate.

Table 13 shows death percentages from melanoma of the skin for four age groupings.

Table 13: Percentage distribution of deaths from malignant melanoma of the skin, by age and sex, 2006

	Total population		
	Total	**Male**	**Female**
<25	0.0	0.0	0.0
25–44	7.7	7.5	7.9
45–64	22.6	20.8	25.4
65+	69.7	71.7	66.7

The proportion of malignant melanoma deaths in the 25 to 44 year age range was higher than that of many of the cancers analysed previously.

Cervical cancer (C53)

Cervical cancer, or malignant neoplasm of the cervix uteri, has shown a strong downward mortality trend over the 1987 to 2006 period. The National Cervical Screening Programme was established in 1991.[6]

There were 52 deaths from cervical cancer in 2006 accounting for 1.3 percent of total female cancer deaths.

Table 14 and Figure 20 show the number and age-standardised rate of female deaths from cervical cancer from 1987 to 2006.

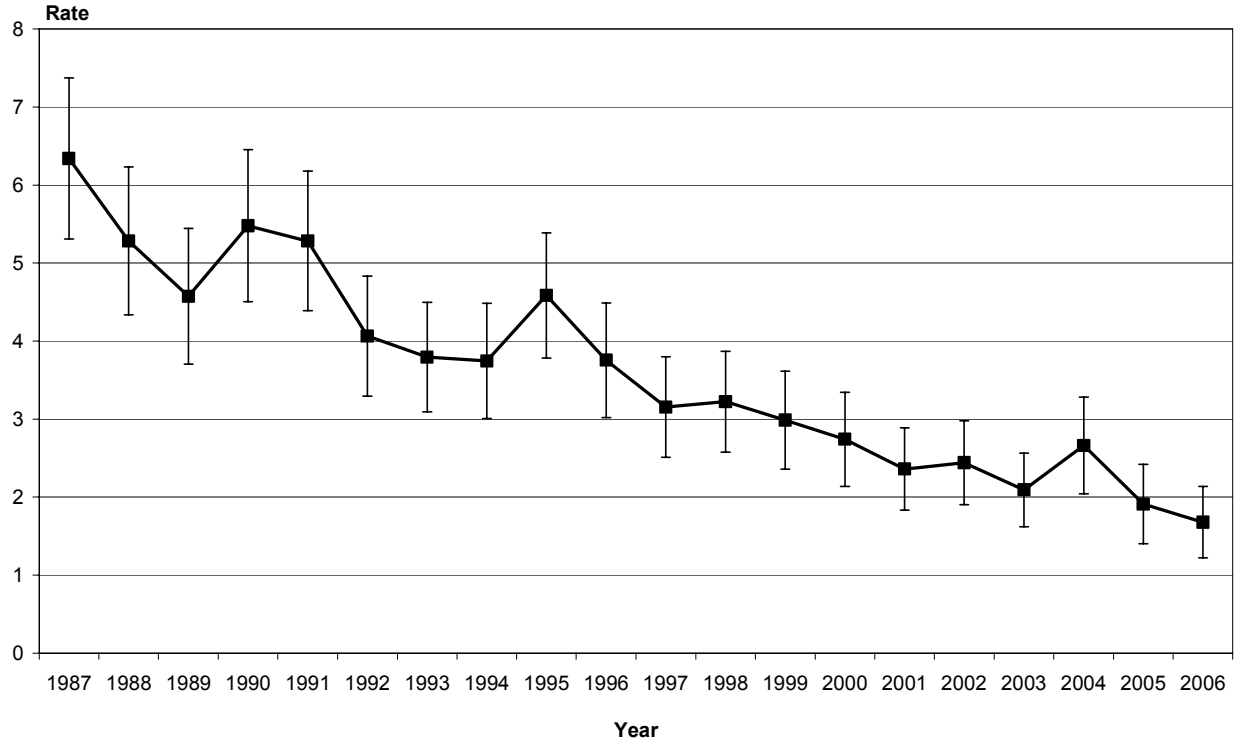
Table 14: Numbers and age-standardised death rates from cervical cancer, 1987–2006

Year	No.	Rate
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

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

[6] For further information, refer http://www.nsu.govt.nz/.

Figure 20: Death rates from cervical cancer, 1987–2006



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

Table 14 and Figure 20 show that the age-standardised cervical cancer mortality rate decreased by 73.5 percent over this period (from 117 cases in 1987 to 52 in 2006).

Confidence intervals have been shown because of the low numbers. Low sample sizes can produce changes in rates that look large, but, in reality, are based on only a small number of deaths. Confidence intervals help to determine if these changes are not due to chance, or merely random variance (see Statistical notes in the Explanatory notes section for further information on confidence intervals). An examination of the confidence intervals here shows a genuine downward trend from 1996 to 2006.

Table 15 shows cervical cancer death percentages for four age groupings for Māori and non-Māori.

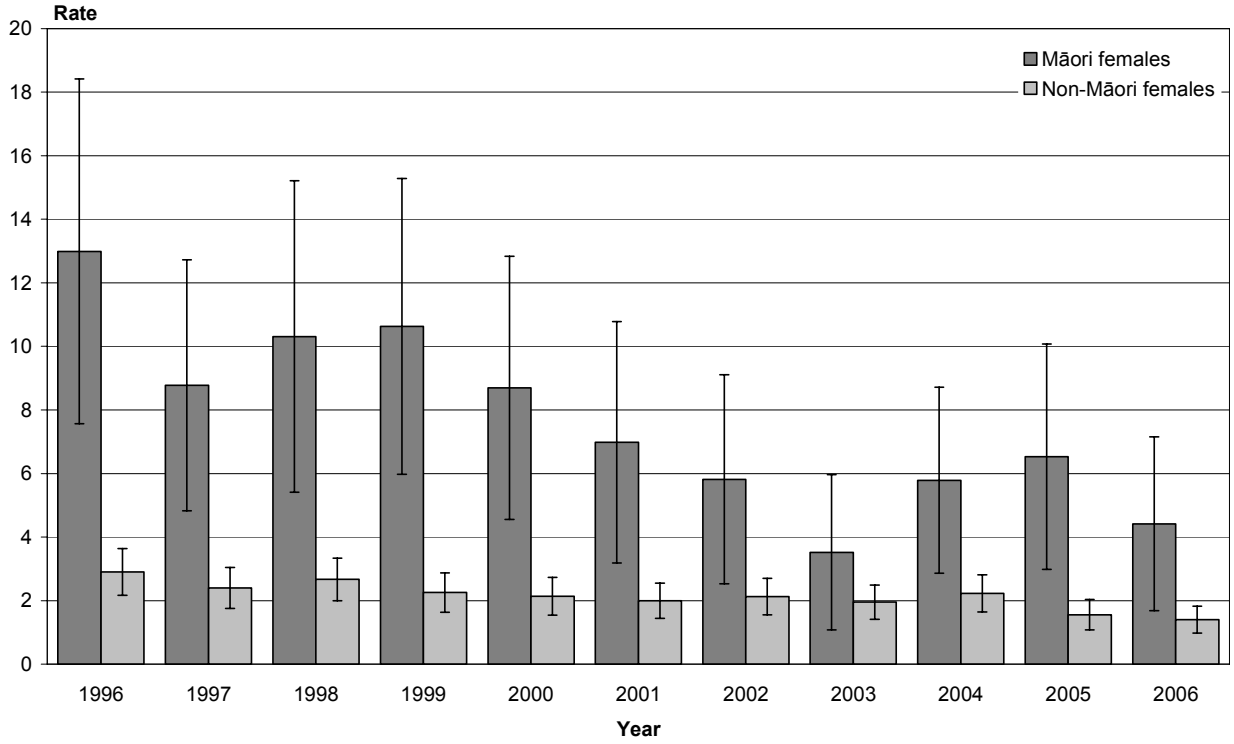
Table 15: Percentage distribution of deaths from cervical cancer, by age and ethnicity, 2006

	Māori female	Non-Māori female
<25	0.0	0.0
25–44	10.0	14.3
45–64	80.0	14.3
65+	10.0	71.4

Māori have a high percentage of deaths in the 45 to 64 age group. However, the actual number of Māori deaths from cervical cancer is very low so figures for Māori will tend to vary more from year to year than those for non-Māori.

Figure 21 shows the cervical cancer age-standardised mortality rate for Māori and non-Māori from 1996 to 2006.

Figure 21: Death rates from cervical cancer, by ethnicity, 1996–2006



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

Māori accounted for 19.2 percent of cervical cancer deaths in 2006 and the calculated Māori age-standardised death rate was 3.2 times greater than the non-Māori rate.

The calculated Māori age-standardised rate of cervical cancer death decreased by 66.0 percent from 1996 to 2006, while the non-Māori rate decreased by 51.8 percent. In recent years the gap between Māori and non-Māori cervical cancer mortality has narrowed.

Note that the Māori numbers here are low (2006 n=10), and the error bars in Figure 21 reflect the large potential variance associated with such small totals. Rates and calculations based on small totals must be interpreted with caution.

Ischaemic heart disease (I20–I25)

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 (ischaemia). This can cause damage to the heart muscle or, in more severe cases, lead to myocardial infarction (a heart attack).

Ischaemic heart disease was the second leading cause of death after cancer in 2006, with 5912 deaths. Males accounted for 53.0 percent of these deaths, but the male age-standardised rate was nearly twice the female rate in 2006.

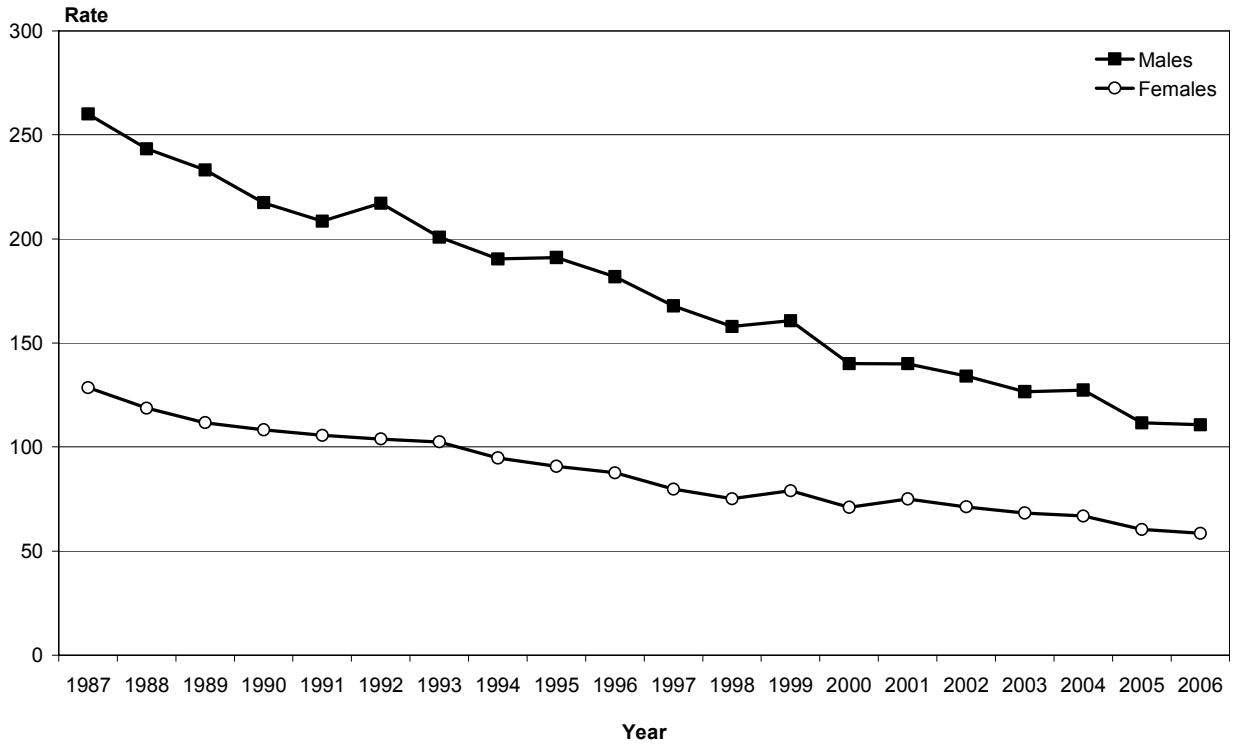
Table 16 and Figure 22 show numbers and age-standardised mortality rates for ischaemic heart disease from 1987 to 2006.

Table 16: Numbers and age-standardised death rates from ischaemic heart disease, by sex, 1987–2006

Year	Males		Females	
	No.	Rate	No.	Rate
1987	4379	260.0	3235	128.5
1988	4173	243.3	3079	118.6
1989	4071	233.2	2964	111.7
1990	3884	217.4	2923	108.3
1991	3789	208.5	2954	105.6
1992	4064	217.1	3034	103.8
1993	3842	200.9	3056	102.5
1994	3718	190.3	2901	94.7
1995	3810	191.1	2887	90.7
1996	3729	181.8	2904	87.6
1997	3614	167.8	2755	79.7
1998	3479	157.9	2724	75.1
1999	3646	160.7	2925	79.0
2000	3269	140.1	2704	71.1
2001	3389	140.0	2982	75.0
2002	3333	134.0	2954	71.3
2003	3243	126.6	2953	68.2
2004	3366	127.4	2947	66.8
2005	3057	111.6	2750	60.3
2006	3133	110.7	2779	58.5

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

Figure 22: Death rates from ischaemic heart disease, by sex, 1987–2006



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

The male age-standardised rate of death for ischaemic heart disease has shown a downward trend, with a 57.4 percent decrease from 1987 to 2006. Similarly, the female age-standardised death rate decreased by 54.5 percent.

Males had a consistently higher age-standardised mortality rate from ischaemic heart disease than females over this time. The male age-standardised rate was approximately double the equivalent female rate for most of this period (until 2001). In 2006 the male rate was 89.3 percent higher than the female rate. However, the male rate fell, on average, over twice as fast as the female rate during the period covered in Figure 22.

Table 17 shows death percentages from ischaemic heart disease for four age groupings for Māori and non-Māori.

Table 17: Percentage distribution of deaths from ischaemic heart disease, by age, ethnicity and sex, 2006

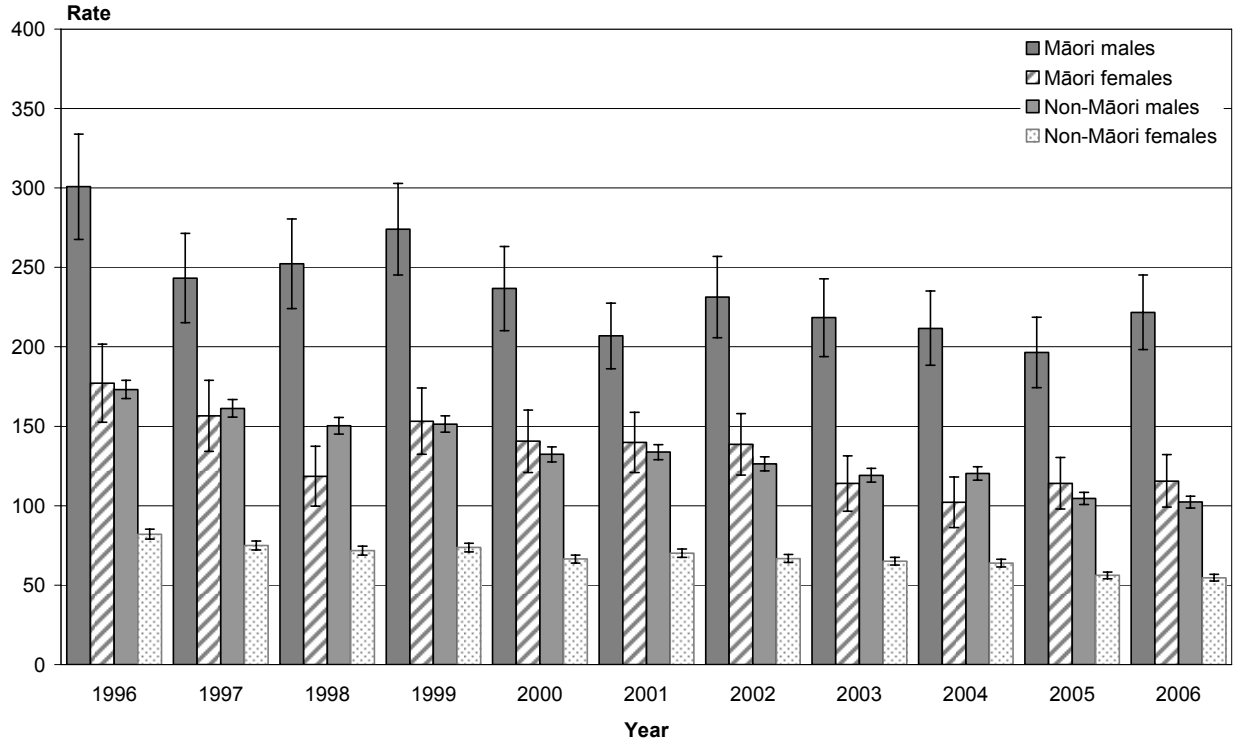
	Māori			Non-Māori		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**
<25	0.0	0.0	0.0	0.0	0.0	0.0
25–44	3.6	4.4	2.1	0.8	1.3	0.3
45–64	37.7	44.9	24.7	9.3	14.4	3.9
65+	58.7	50.7	73.2	89.8	84.3	95.8

The distribution suggests that males typically succumb to this condition at a slightly earlier age than females. However, the largest proportion of deaths occurred in the 65 years and over age group for both sexes.

Māori had a higher proportion of deaths in the 45 to 64 year old age group than non-Māori.

Figure 23 shows Māori and non-Māori deaths from ischaemic heart disease from 1996 to 2006.

Figure 23: Death rates from ischaemic heart disease, by sex and ethnicity, 1996–2006



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

Of the four groups, the Māori male population had the highest age-standardised rate of death in 2006. The calculated Māori male age-standardised rate of death from ischaemic heart disease was 116.7 percent higher than the non-Māori male rate, and the calculated Māori female rate was 111.5 percent higher than the non-Māori female rate.

While the age-standardised rates for Māori males were higher than all the other groups, the rate for Māori females approximates that of non-Māori males.

The five conditions that make up the ischaemic heart disease classification grouping are:

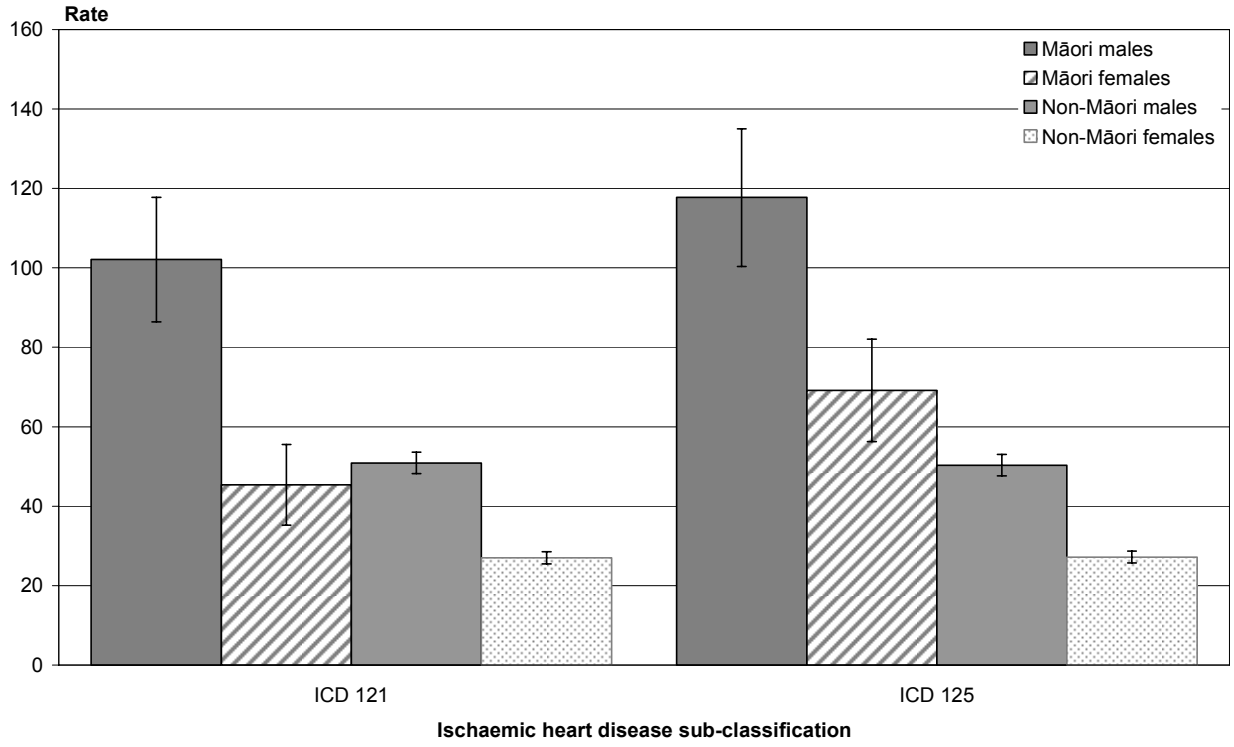
- I20 angina pectoris
- I21 acute myocardial infarction
- I22 subsequent myocardial infarction
- I24 other acute ischaemic heart diseases
- I25 chronic ischaemic heart disease.

Of these conditions, acute myocardial infarction (I21) and chronic ischaemic heart disease (I25) together account for the majority of the mortality cases reported for 2006 (99 percent).

Chronic ischaemic heart disease was responsible for 50.2 percent of ischaemic heart disease deaths in 2006.

Figure 24 compares the mortality composition by, ethnicity and sex, of these two conditions in 2006.

Figure 24: Death rates from acute myocardial infarction (ICD I21) and chronic ischaemic heart disease (ICD I25), by sex and ethnicity, 2006



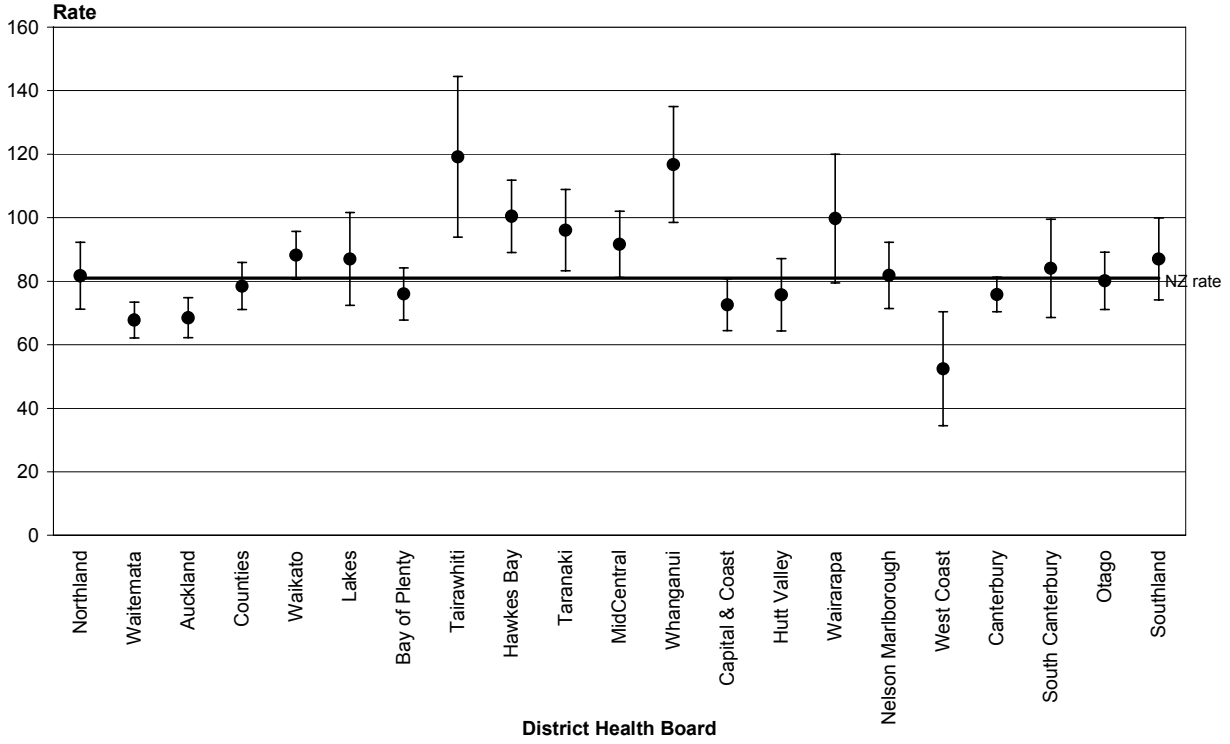
Note: Rates per 100,000 population, age-standardised to WHO World Standard Population; 95% confidence intervals.

Figure 24 suggests that the pattern of mortality incidence of these two conditions is generally similar, with few differences based on sex or ethnicity.

Males had a higher age-standardised mortality rate for both conditions, both generally and within the ethnic groups.

Figure 25 shows ischaemic heart disease age-standardised death rates by DHB for the total population, 2006.

Figure 25: Ischaemic heart disease death rates by DHB, total population, age-standardised rates, 2006



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

There is more regional variance in ischaemic heart disease death rates than that shown for cancer or cerebrovascular disease (see Figures 12 and 29). Four DHBs (Tairawhiti, Hawkes Bay, Taranaki and Whanganui) were probably above the New Zealand rate, and three DHBs (Waitemata, Auckland and West Coast) were probably lower.

Cerebrovascular disease (I60–I69)

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 the brain is impaired by blockage or rupture of an artery in the brain). 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.

Cerebrovascular disease was the third leading cause of death in the total population in 2006, after cancer and ischaemic heart disease.

There were 2674 deaths from cerebrovascular disease in 2006 and the majority (62.6 percent) were female deaths.

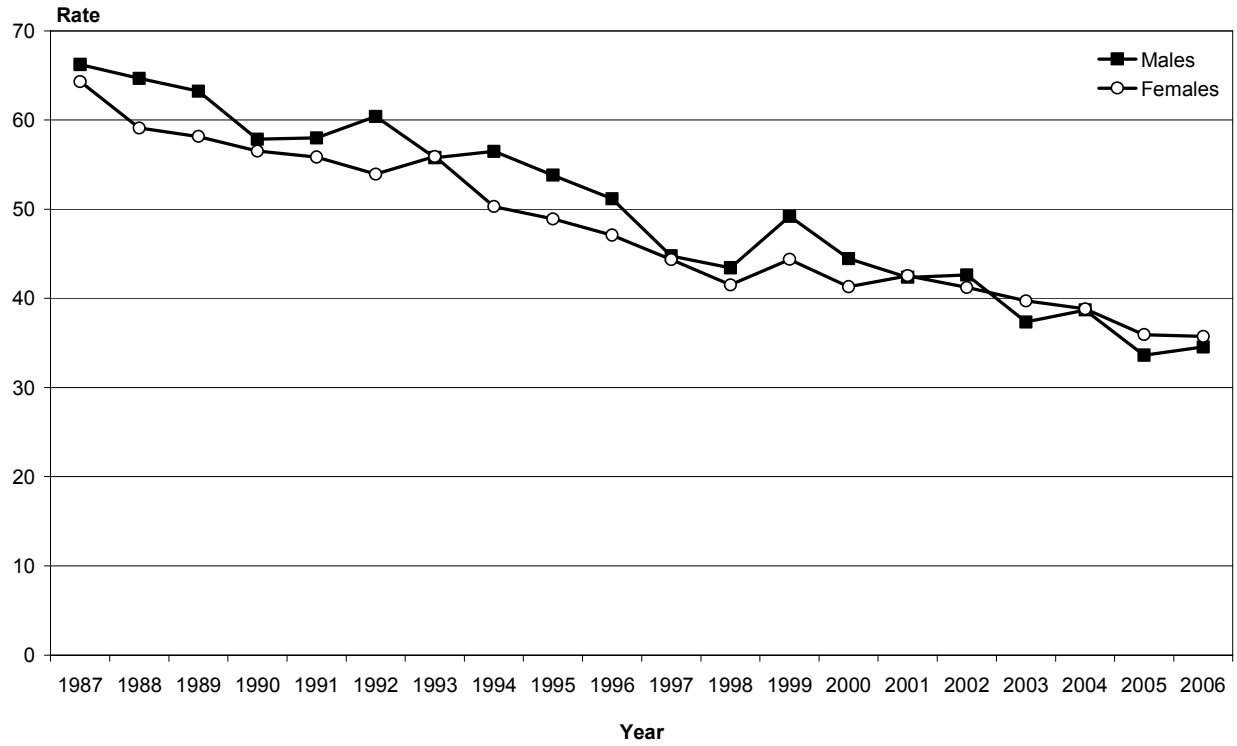
Table 18 and Figure 26 show cerebrovascular disease mortality numbers and age-standardised rates for the period 1987 to 2006.

Table 18: Numbers and age-standardised death rates from cerebrovascular disease, by sex, 1987–2006

Year	Males		Females	
	No.	Rate	No.	Rate
1987	1076	66.2	1675	64.3
1988	1077	64.7	1616	59.1
1989	1072	63.2	1597	58.2
1990	1021	57.8	1579	56.5
1991	1036	58.0	1624	55.9
1992	1113	60.4	1621	53.9
1993	1061	55.8	1727	55.9
1994	1096	56.5	1631	50.3
1995	1070	53.8	1645	48.9
1996	1045	51.2	1614	47.1
1997	966	44.8	1600	44.4
1998	960	43.4	1532	41.5
1999	1129	49.2	1706	44.4
2000	1048	44.5	1620	41.3
2001	1036	42.4	1748	42.5
2002	1078	42.6	1751	41.2
2003	969	37.4	1723	39.7
2004	1050	38.7	1756	38.8
2005	940	33.6	1647	35.9
2006	1000	34.5	1674	35.8

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

Figure 26: Death rates from cerebrovascular disease, by sex, 1987–2006



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

The male age-standardised death rate in 2006 was 47.8 percent lower than in 1987 and the female rate was 44.4 percent lower.

Males and females had similar age-standardised rates of death over this period. The male rate dropped below that of the female rate in 2003 and has stayed just under females in subsequent years.

Table 19 shows death percentages from cerebrovascular disease for four age groupings for Māori and non-Māori.

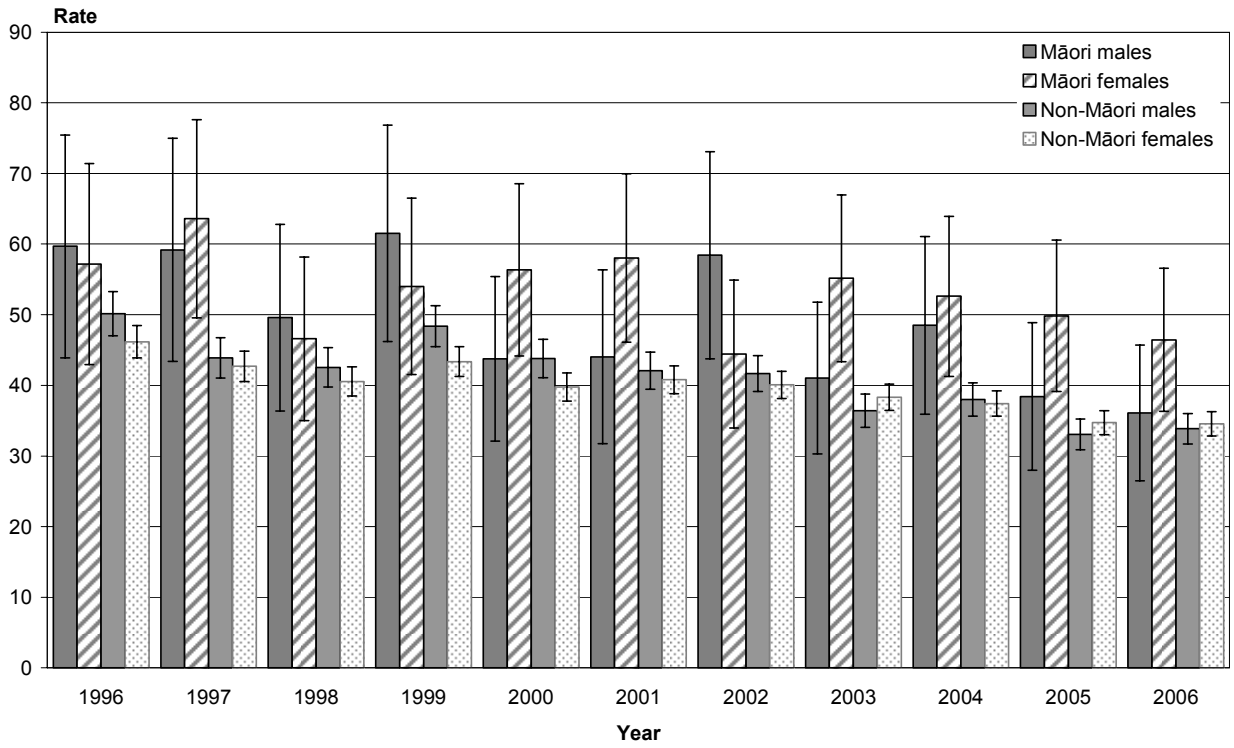
Table 19: Percentage distribution of deaths from cerebrovascular disease, by age, ethnicity and sex, 2006

	Māori			Non-Māori		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**
<25	0.0	0.0	0.0	0.0	0.0	0.1
25–44	11.1	7.4	13.6	1.3	1.7	1.1
45–64	24.4	31.5	19.8	5.2	7.1	4.1
65+	64.4	61.1	66.7	93.4	91.2	94.7

For non-Māori, there were a high proportion of deaths in the 65 years and over age group (93.4 percent). Māori, however, had a greater proportion of the deaths in the younger age groups. For Māori, 35.6 percent of mortality from cerebrovascular disease occurred below the age of 65, while for non-Māori only 6.6 percent of mortality occurred below the age of 65.

Figure 27 shows age-standardised mortality rates from cerebrovascular disease, by sex and ethnicity, from 1996 to 2006.

Figure 27: Death rates from cerebrovascular disease, by sex and ethnicity, 1996–2006



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

Māori females had the highest age-standardised mortality rate of the four groups in 2006, followed by Māori males. The calculated Māori male age-standardised rate was 6.6 percent higher than the non-Māori male rate in 2006, and the calculated Māori female rate was 34.3 percent higher than the non-Māori female rate.

The Māori rates shown in Figure 27 are highly variable; Māori male rates were highest in four of the 11 years presented, while Māori female rates were highest in the other seven. Māori females have been higher than Māori males for the last four years though.

The seven conditions that make up cerebrovascular disease mortality are:

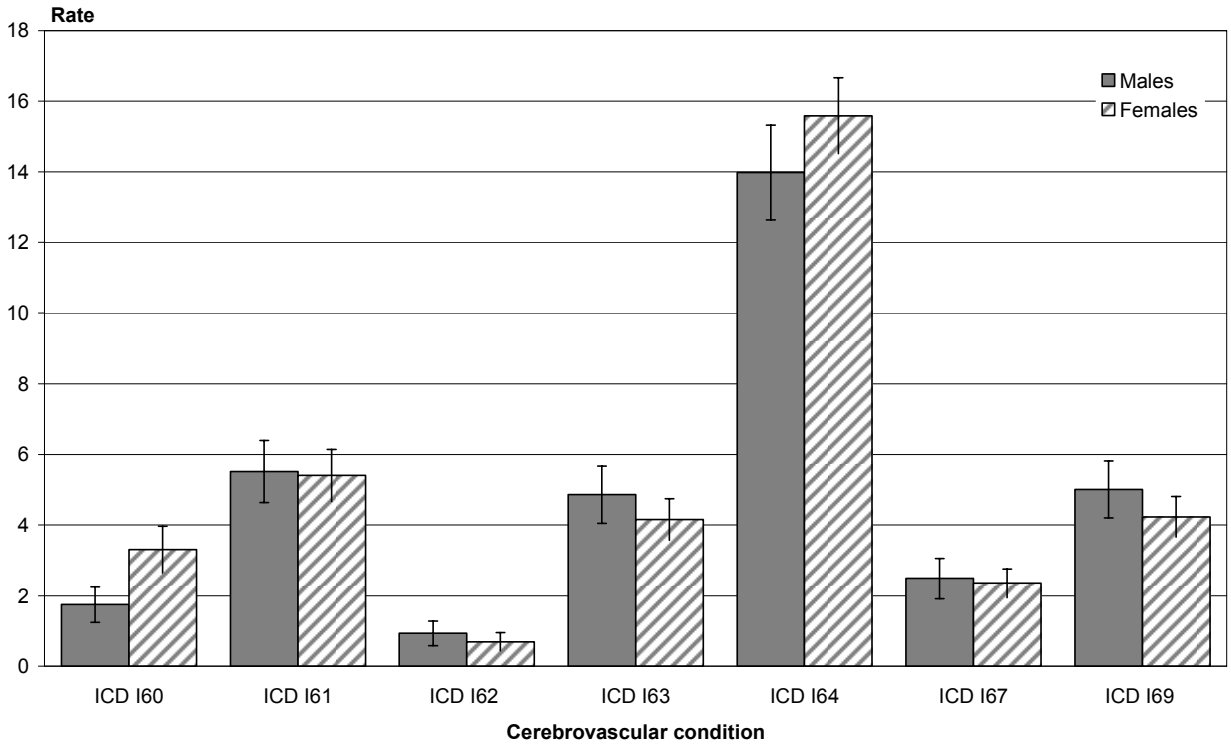
- I60 Subarachnoid haemorrhage
- I61 Intracerebral haemorrhage
- I62 Other non-traumatic intracranial haemorrhage

- I63 Cerebral infarction
- I64 Stroke, not specified as haemorrhage or infarction
- I67 Other cerebrovascular diseases
- I69 Sequelae of cerebrovascular disease.

Note that the term ‘sequelae’ refers to a condition that follows as a consequence of a disease.

Figure 28 shows the mortality rates for each of the (above) major conditions that make up the cerebrovascular disease group for the total population, by sex, for the year 2006. The conditions I65 and I66 accounted for two deaths and one death respectively.

Figure 28: Death rates from cerebrovascular disease, by specific disease classification and sex, 2006



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

Of the above conditions, ‘stroke, not specified as haemorrhage or infarction’ (I64) accounted for 45.9 percent of cerebrovascular disease-related mortality in 2006.

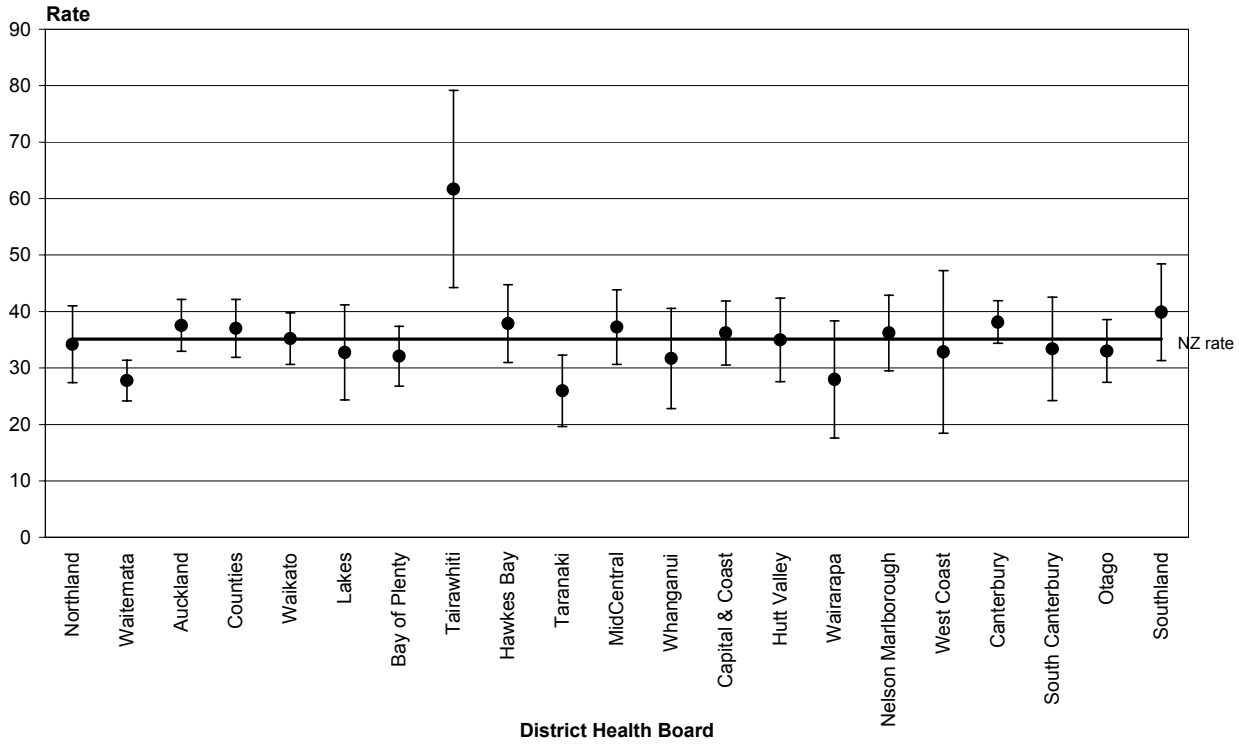
The three other major causes of 2006 cerebrovascular-related mortality are:
- cerebral infarction (12.3 percent of cerebrovascular disease-related deaths)
- intracerebral haemorrhage (13.4 percent)
- sequelae of cerebrovascular disease (13.5 percent).

Together, these four conditions accounted for 85.0 percent of 2006 mortality from cerebrovascular disease.

The cerebrovascular conditions display varying sex biases; Figure 28 shows that either males or females have higher mortality rates, depending on the particular condition. However, the gender difference appears to be significant only for 'subarachnoid haemorrhage' (I60).

Figure 29 shows cerebrovascular disease age-standardised death rates by DHB for the total population, 2006.

Figure 29: Cerebrovascular disease death rates by DHB, total population, age-standardised rates, 2006



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

The regional distribution of cerebrovascular disease death rates is consistent with the New Zealand rate. One DHB (Tairawhiti) was probably above the New Zealand rate, and two DHBs (Waitemata and Taranaki) were probably lower.

Diabetes mellitus (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 (non-insulin dependent diabetes mellitus, or adult-onset diabetes). Type 2 diabetes is much more common than type 1.

Type 1 diabetes means the body does not produce sufficient insulin – it might make only a little or none at all. Type 1 diabetes usually starts in the teenage years or when puberty begins, though onset can occur later in life.

Type 2 diabetes means the body 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 to 40 years), and common risk factors include: genetic predisposition (eg, ethnicity; having a relative with type 2 diabetes), obesity, lack of exercise and socioeconomic status. People suffering from type 2 diabetes can become insulin dependent as the disease progresses.

There were 860 deaths from diabetes mellitus in 2006, with slightly more male (52.0 percent) than female deaths.

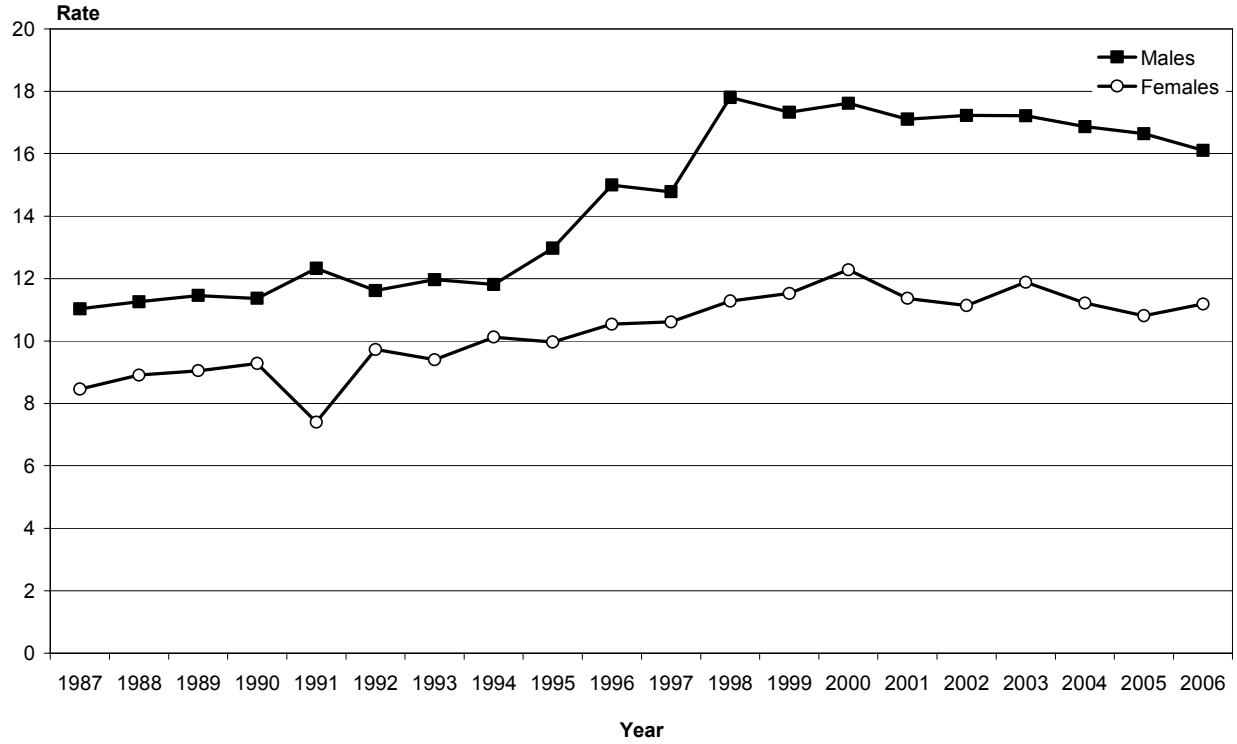
Table 20 and Figure 30 show diabetes mellitus mortality numbers and age-standardised rates for the period 1987 to 2006.

Table 20: Numbers and age-standardised death rates from diabetes mellitus, by sex, 1987–2006

Year	Total males		Total females	
	No.	Rate	No.	Rate
1987	184	11.0	189	8.5
1988	192	11.3	205	8.9
1989	196	11.5	209	9.0
1990	203	11.4	211	9.3
1991	226	12.3	177	7.4
1992	220	11.6	238	9.7
1993	228	12.0	231	9.4
1994	228	11.8	258	10.1
1995	255	13.0	253	10.0
1996	306	15.0	289	10.5
1997	316	14.8	317	10.6
1998	387	17.8	343	11.3
1999	385	17.3	355	11.5
2000	408	17.6	394	12.3
2001	405	17.1	377	11.4
2002	427	17.2	378	11.1
2003	436	17.2	411	11.9
2004	438	16.9	405	11.2
2005	447	16.6	392	10.8
2006	447	16.1	413	11.2

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

Figure 30: Death rates from diabetes mellitus, by sex, 1987–2006



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

The male age-standardised rate of death from diabetes has shown an upward trend from 1987 to 2006, with a 46.0 percent increase over the period. The female age-standardised rate over the same period increased by 32.1 percent. Males had a consistently higher age-standardised rate of death from diabetes mellitus over this time, and, in 2006, the male rate was 44.1 percent higher than the female rate.

Table 21 shows death percentages from diabetes mellitus for four age groupings for Māori and non-Māori.

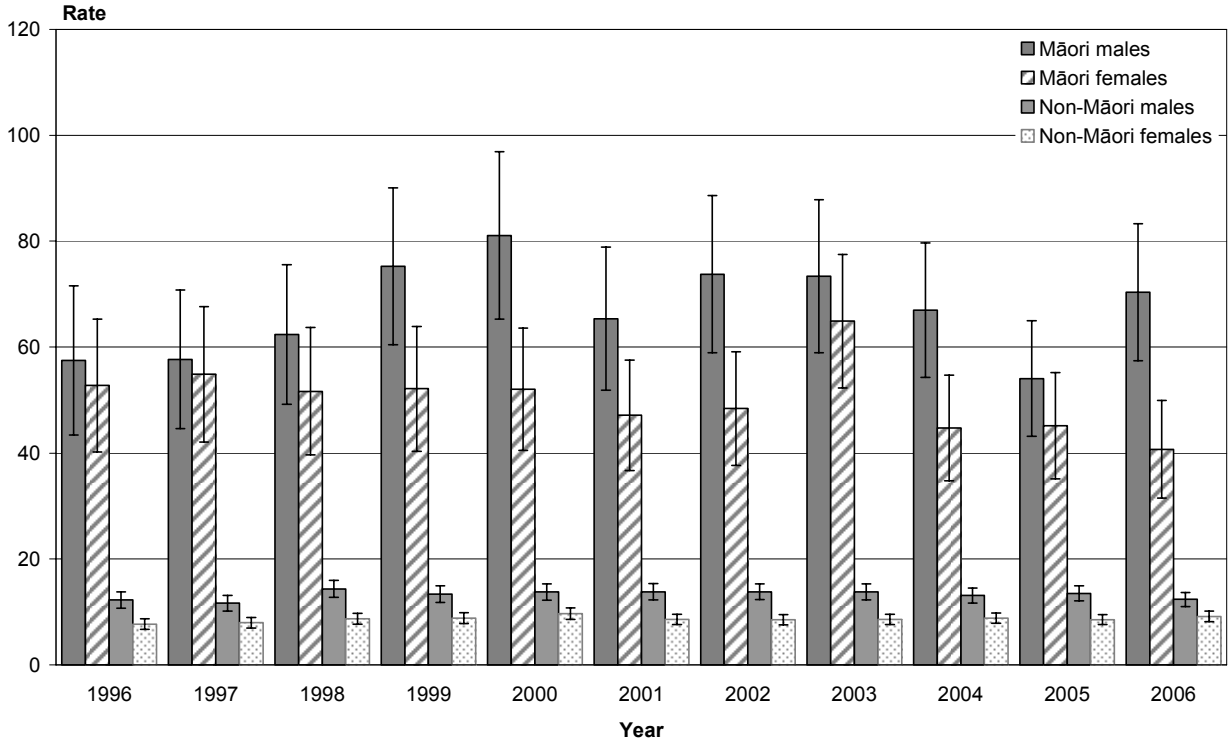
Table 21: Percentage distribution of deaths from diabetes mellitus, by age, ethnicity and sex, 2006

	Māori			Non-Māori		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**
<25	0.5	0.0	1.3	0.4	0.0	0.9
25–44	4.2	0.9	9.3	2.1	2.4	1.8
45–64	43.4	52.6	29.3	14.2	16.5	11.8
65+	51.9	46.5	60.0	83.3	81.1	85.5

The age distribution shows that diabetes mortality was largely confined to the 45 years and older age groups, with only a small number of deaths occurring below this range. Māori had a greater proportion of deaths in the 45 to 64 age group than non-Māori.

Figure 31 shows age-standardised mortality rates from diabetes mellitus by sex and ethnicity from 1996 to 2006.

Figure 31: Death rates from diabetes mellitus, by sex and ethnicity, 1996–2006



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

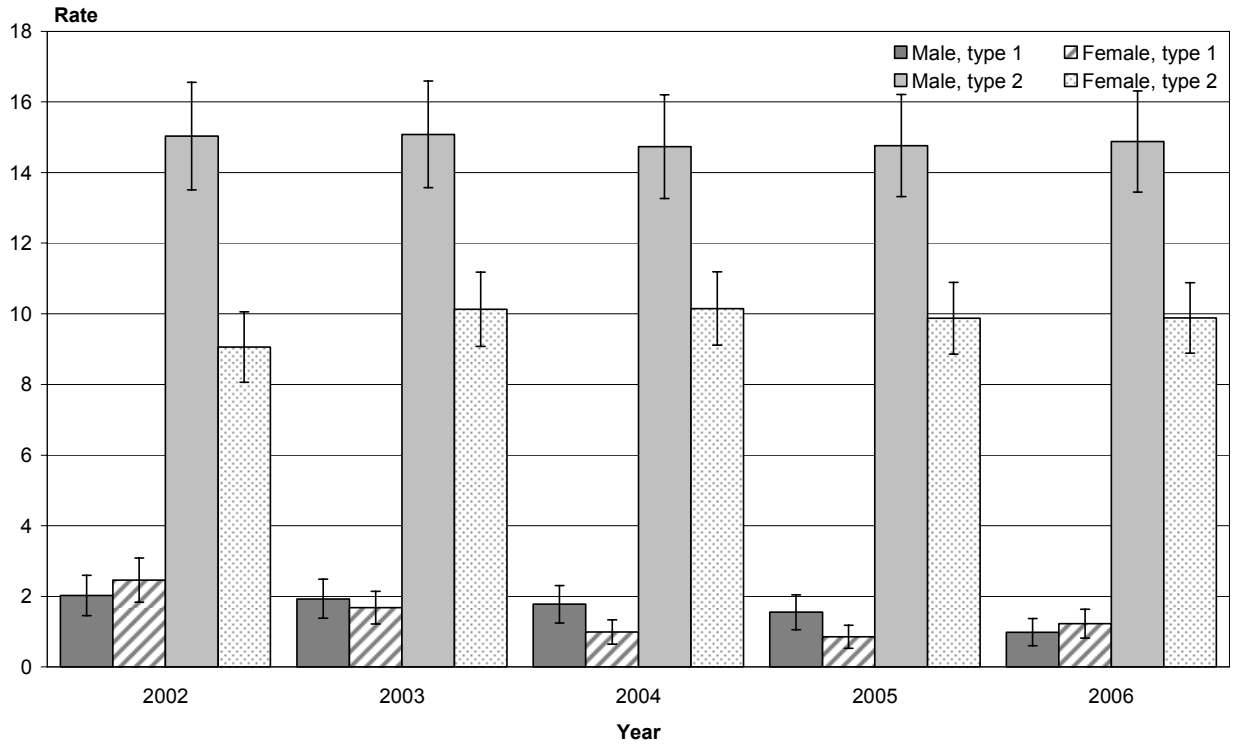
Māori males had the highest age-standardised mortality rate of the four groups in 2006, followed by Māori females. The calculated Māori male age-standardised rate of diabetes mellitus was 468 percent higher than the non-Māori male rate in 2006, and the calculated Māori female rate was 344 percent higher than the non-Māori female rate.

The three conditions that make up diabetes mellitus mortality are:

- E10 type 1 diabetes mellitus
- E11 type 2 diabetes mellitus
- E14 unspecified diabetes mellitus.

Figure 32 shows age-standardised death rates for type 1 and type 2 diabetes mellitus by sex from 2002 to 2006.

Figure 32: Death rates from diabetes mellitus, by diabetes type and sex, 2002–2006



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

Of these conditions, type 2 diabetes mellitus accounted for 92.0 percent of diabetes mortality in 2006. Very few cases (2006 n=8) were classified as unspecified diabetes mellitus (E14).

Males had a consistently higher rate of type 2 diabetes mortality than females from 2002 to 2006. Type 1 rates were closer between the two sexes and within the margin of error.

Further Mortality-related Information

Electronic version of the *Mortality and Demographic Data* publication

Electronic copies of this publication series (in PDF format) are available at: http://www.nzhis.govt.nz/moh.nsf/pagesns/33?Open#09.

Statistical mortality data available

Statistical mortality data tables are available online from: http://www.nzhis.govt.nz/moh.nsf/pagesns/33?Open#09. These files are in Excel format and include an expanded range of data from previous print editions.

These tables contain raw mortality figures (ie, the actual number of deaths) for the complete range of ICD-10-AM-II classifications, with sex and five-year age groupings.

National-level mortality

Table 1: Deaths from all causes, by age, sex and ethnicity, 2006.

Table 2: Causes of death: ICD chapter headings by age and sex, total population, 2006.

Table 3: Causes of death: subgroups by age and sex, total population, 2006.

Table 4: Causes of death: individual three-character codes by age and sex, total population, 2006.

Regional-level mortality

Table R1: Deaths by DHB district: age and sex, total population, 2006.

Table R2: Causes of death by DHB district: ICD chapter headings by age and sex, total population, 2006.

Table R3: Causes of death by DHB district: subgroups by age and sex, total population, 2006.

Table R4: Causes of death by DHB district: individual three-character codes by age and sex, total population, 2006.

Table MR1: Deaths by DHB district: age and sex, Māori population, 2006.

Table MR2: Causes of death by DHB district: ICD chapter headings by age and sex, Māori population, 2006.

Table MR3: Causes of death by DHB district: subgroups by age and sex, Māori population, 2006.

Table MR4: Causes of death by DHB district: individual three-character codes by age and sex, Māori population, 2006.

Table PR1: Deaths by DHB district: age and sex, Pacific peoples population, 2006.

Table PR2: Causes of death by DHB district: ICD chapter headings by age and sex, Pacific peoples population, 2006.

Table PR3: Causes of death by DHB district: subgroups by age and sex, Pacific peoples population, 2006.

Table PR4: Causes of death by DHB district: individual three-character codes by age and sex, Pacific peoples population, 2006.

Ethnic-level mortality

Table M1: Causes of death: ICD chapter headings by age and sex, Māori population, 2006.

Table M2: Causes of death: subgroups by age and sex, Māori population, 2006.

Table M3: Causes of death: individual three-character codes by age and sex, Māori population, 2006.

Table P1: Causes of death: ICD chapter headings by age and sex, Pacific peoples population, 2006.

Table P2: Causes of death: subgroups by age and sex, Pacific peoples population, 2006.

Table P3: Causes of death: individual three-character codes by age and sex, Pacific peoples population, 2006.

Table NM1: Causes of death: ICD chapter headings by age and sex, non-Māori population, 2006.

Table NM2: Causes of death: subgroups by age and sex, non-Māori population, 2006.

Table NM3: Causes of death: individual three-character codes by age and sex, non-Māori population, 2006.

Table A1: Causes of death: ICD chapter headings by age and sex, Asian* population, 2006.

Table A2: Causes of death: subgroups by age and sex, Asian* population, 2006.

Table A3: Causes of death: individual three-character codes by age and sex, Asian* population, 2006.

* Asian ethnicity codes are 40–44.
40 Asian not further defined
41 Southeast Asian
42 Chinese
43 Indian
44 Other Asian

Other mortality-related Ministry publications

- Further detailed information on numbers and rates of livebirths, fetal, neonatal and post-neonatal deaths are published in the annual publication series, *Fetal and Infant Deaths* (http://www.nzhis.govt.nz/moh.nsf/pagesns/33?Open#03).
- Information on maternal deaths can be found in: *Report on Maternity: Maternal and newborn information* (http://www.nzhis.govt.nz/moh.nsf/pagesns/33?Open#05).
- Further information on cancer incidence and mortality can be found in *Cancer: New registrations and deaths* (http://www.nzhis.govt.nz/moh.nsf/pagesns/33#01).

Other Ministry publications

Ministry of Health publications can be found at:

- http://www.moh.govt.nz/publications
- http://www.nzhis.govt.nz/moh.nsf/indexns/publications.

Suicide (intentional self-harm) data

Information on suicide can be found at:

- http://www.nzhis.govt.nz/moh.nsf/pagesns/32?Open#10
- http://www.moh.govt.nz/suicideprevention (click on suicide statistics link).

Population and demographic data

For population and other demographic data contact the Ministry of Health, or Statistics New Zealand (http://www.stats.govt.nz).

Mortality data available from the Ministry

Item		Notes
1	Health care user number	Also known as National Health Index (NHI) number. Restricted access.
2	Domicile code	Based on Statistics New Zealand Standard Area Unit code used for the 2001 Census.
3	Sex	Male, female.
4	Ethnicity	Based on Statistics New Zealand Standard Classification 1996 (Level 2), for example NZ Māori, NZ European or Pakeha, Other European, Samoan, Chinese, and so on. Up to three ethnicities are recorded.
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.

Item	Notes
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 the World Health Organization *International Classification of Diseases, 10th Revision, Australian Modification 2nd edition (ICD-10-AM-II).*
13 Selected contributing disease or condition	Codes from ICD-10-AM-II (as above) for selected conditions of interest to researchers, for example diabetes mellitus, drug abuse, injuries, and so on.
14 Fetal and infant deaths	Fetal, early-neonatal, late-neonatal, post-neonatal deaths.
15 Cot death indicator	Sudden Infant Death Syndrome (SIDS) 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 Postmortem indicator	Indicates whether a postmortem was performed and/or used in classification by the Ministry of Health.
18 Death certifier	Certified by doctor, or coroner with/without inquest, coroner's interim report.
19 Death information source	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.
20 Comments	Free text field that contains additional comments relating to the death (eg, may include details of accidents or time sequence of conditions).
21 Occupation	Text description of deceased's usual occupation (or former occupation if retired). Collected since 1998.
22 Work-related indicator*	Recorded if the cause of death was known to be due to an accident while at work.
23 Alcohol-involved indicator*	Records if alcohol consumption preceded death, where reported. Only recorded for deaths certified by a coroner.
24 Blood alcohol level*	Recorded in mg/100 mls blood, where reported. Only recorded for deaths certified by a coroner.
25 Birthweight	Weight at birth in grams. Recorded where known for deaths of infants less than one year of age and for stillbirths.
26 Gestation	Gestation (in weeks) of infant at birth. Recorded where known for deaths of infants less than one year of age and for stillbirths.

* Recorded from registration year 2000.

For a full listing of available fields, please refer to the Mortality Collection Data Dictionary (available at: http://www.nzhis.govt.nz/moh.nsf/pagesns/235?Open).

Additional information available from the Ministry

You may require information not included in this report or in the online statistical tables. The Ministry of Health is capable of producing customised data extracts tailored to your needs. However, these may incur a charge (at Official Information Act rates). Should you require additional data or analysis, please contact:

Information Services
Ministry of Health
Phone (04) 496 2000
Fax (04) 816 2898

Ministry of Health
PO Box 5013
Wellington
New Zealand

Email: data-enquiries@moh.govt.nz
or visit: http://www.moh.govt.nz

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

Explanatory Notes

Mortality notes

Deaths

Every death occurring in New Zealand requires registration at the Births, Deaths and Marriages Registry within three working days after the day of burial or cremation in a city or borough, or seven working days in any other case. The law does not impose any limit of time after which a death may not be registered. The death statistics in this publication relate to registrations during the year and not the actual number of deaths during the year.

Causes of death

The *International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification, 2nd Edition (ICD-10-AM)* was used to classify the causes of death throughout this report (National Centre for Classification in Health 2002).

In New Zealand, the selection of the cause of death, where more than one cause is entered on a medical certificate, follows the WHO mortality rules and guidelines for selection of the underlying cause of death. This is largely determined from the statement of the certifying doctor or coroner, but reference is also made to postmortem reports received and cancer registrations. On some occasions, coded hospital inpatient event summaries are compared with the entries on the medical certificate in order to obtain more specific information. Information is also obtained from letters to certifying doctors, medical records departments, Land Transport New Zealand, Water Safety New Zealand, Media Search, and visits to Coronial Services.

Where a death is due to an external cause, such as an accident, it is the external cause and not the resulting injury that 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 listed as the cause of death. The sites and types of injuries are coded as contributing causes, if reported.

Population notes

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 a four-digit Health Domicile Code specially created by Statistics New Zealand from its six-digit Census Area Unit Code. In 2006, the Health Domicile Code used was based on the 2001 Census Area Unit Code.

Changes to population data

In a departure from historical practice, Statistics New Zealand now produces the national population estimates to relate to the usually-resident population. Previously, both the national and subnational estimates related to 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 has adopted the resident population concept to ensure that estimates reflect more accurately the population that resides in New Zealand. Usually resident population estimates are available back to 1991.

The main alternative of using the 'resident population' concept rather than the 'de facto population' concept is that the resulting demographic indices will be slightly lower. This is because of a smaller numerator (as births, deaths, marriages and so on registered to overseas visitors while in New Zealand are excluded) and a bigger denominator (due to the slightly larger population estimates).

In keeping with Statistics New Zealand, the populations now used by the Ministry of Health are estimated mean New Zealand resident populations. Rates in this publication have been recalculated back to 1991 using the estimated mean resident population figures. For this reason, rates in this publication for 1992 to 1996 will differ slightly from the rates published in earlier publications.

Population data

The following population data is employed in this publication:

Estimated resident population of New Zealand by sex and five-year age group, mean year ended 31 December 2006

Age group	Total			Māori			Non-Māori		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
0–4	286,250	146,420	139,830	73,110	37,500	35,600	213,140	108,920	104,230
5–9	291,840	149,230	142,610	71,230	36,460	34,770	220,610	112,770	107,840
10–14	310,490	159,500	150,990	70,810	36,460	34,350	239,680	123,040	116,640
15–19	313,750	159,470	154,280	66,000	32,910	33,080	247,750	126,560	121,200
20–24	291,570	146,030	145,540	50,450	24,400	26,050	241,120	121,630	119,490
25–29	261,040	127,100	133,940	43,420	20,540	22,870	217,620	106,560	111,070
30–34	286,250	136,420	149,830	43,260	20,230	23,040	242,990	116,190	126,790
35–39	312,620	149,190	163,430	42,440	19,880	22,550	270,180	129,310	140,880
40–44	322,690	156,030	166,650	40,490	19,160	21,330	282,200	136,870	145,320
45–49	305,210	149,130	156,070	35,330	16,720	18,610	269,880	132,410	137,460
50–54	263,700	129,950	133,750	26,840	12,940	13,900	236,860	117,010	119,850
55–59	242,530	119,820	122,710	20,840	10,010	10,830	221,690	109,810	111,880
60–64	187,410	92,300	95,110	14,210	6,810	7,400	173,200	85,490	87,710
65–69	155,650	75,650	80,000	11,310	5,410	5,900	144,340	70,240	74,100
70–74	120,270	57,470	62,800	7,160	3,350	3,810	113,110	54,120	58,990
75–79	103,640	47,590	56,060	4,210	1,820	2,390	99,430	45,770	53,670
80–84	73,980	30,060	43,900	2,000	780	1,220	71,980	29,280	42,680
85+	58,050	18,170	39,900	1,010	320	690	57,040	17,850	39,210
Total	4,186,900	2,049,500	2,137,400	624,100	305,700	318,400	3,562,800	1,743,800	1,819,000

Source: Statistics New Zealand

Note: Because of rounding, individual figures in this table do not always sum to give stated totals.

Ethnicity notes

Ethnicity

Ethnicity data used for deaths is sourced from Births, Deaths and Marriages. Ethnicity data is provided to the funeral director 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 force in September 1995. Previously, ethnicity had been based on ancestry, with the choice of only one ethnic group (‘sole ethnic origin’). The 1995 changes introduced the self-identified ethnicity model. Self-identified ethnicity allows the individual to choose multiple ethnicities based on their preferences or self-concept. Multiple selected ethnicities are then prioritised into a hierarchy.

Key characteristics of ethnicity:

- Ethnicity is self-perceived, so the person concerned should identify their ethnic affiliation wherever feasible
- A person can belong to more than one ethnic group
- The ethnicities with which a person identifies can change over time.

The concept of ethnicity is that of 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, and not only can people belong to more than one ethnic group, they can, and do, change their ethnic affiliation, both over time and in different contexts.

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

Prioritisation

The prioritised ethnicity classification system is a hierarchical structure with four levels, starting with a single digit at Level 1. Further digits are added with each move to a more detailed level, thereby increasing differentiation. Each more detailed level can be mapped up or aggregated to a higher level, as the following example illustrates.

- Level 4 (most detailed level) code 12111 is Celtic.
- Level 3 code 121 is British and Irish.
- Level 2 code 12 is Other European.
- Level 1 (least detailed level) code 1 is European.

The prioritisation hierarchy is shown in the following table (for Level 2 ethnicity).

Priority order	Ethnic group code (L2)	Ethnic group code description
1	21	Māori
2	35	Tokelauan
3	36	Fijian
4	34	Niuean
5	33	Tongan
6	32	Cook Island Māori
7	31	Samoan
8	37	Other Pacific Island
9	30	Pacific Island NFD (Not Further Defined)
10	41	South East Asian
11	43	Indian
12	42	Chinese
13	44	Other Asian
14	40	Asian NFD
15	52	Latin American / Hispanic
16	53	African
17	51	Middle Eastern
18	54	Other
19	12	Other European
20	10	European NFD
21	11	NZ European

For example, if a data provider has indicated four ethnicities and these have been aggregated to Level 2 as 40 – Asian, 21 – Māori, 51 – Middle Eastern, and 11 – NZ European, the prioritised responses would be:

1 2 – Māori
2 40 – Asian
3 51 – Middle Eastern
4 11 – NZ European.

If only three responses are able to be recorded, the 'NZ European' response is omitted.

Further information on ethnicity data protocols for the health and disability sector is available at: http://www.nzhis.govt.nz/moh.nsf/pagesns/228.

Statistical notes

Age-specific and age-standardised rates

Age-specific rate

An age-specific rate is the rate at which a particular health 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 to 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, such as 1000 or, as in the present publication, 100,000). 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 rate

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 (see below). The WHO World Standard Population is a widely used New Zealand and international standard.

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* (available online from the Ministry of Health. See: http://www.moh.govt.nz/publications).

WHO World Standard Population

Age group	Population
0–4	8,860
5–9	8,690
10–14	8,600
15–19	8,470
20–24	8,220
25–29	7,930
30–34	7,610
35–39	7,150

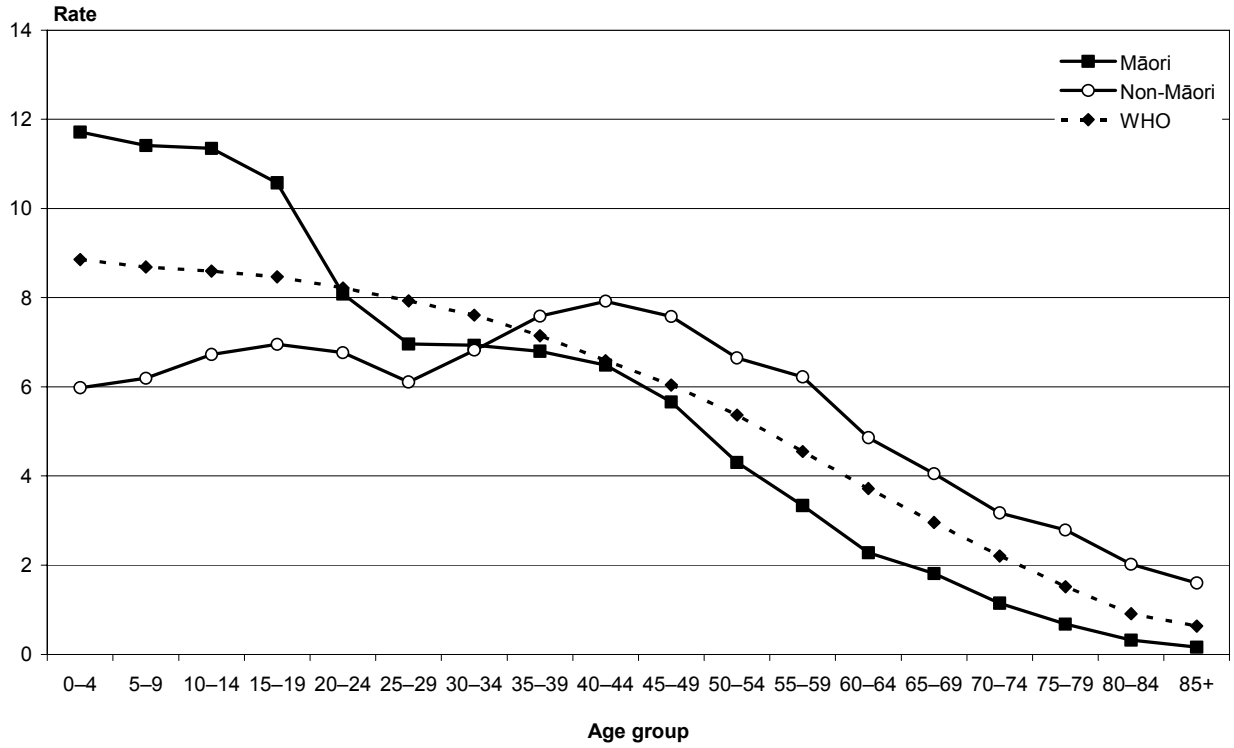
Age group	Population
40–44	6,590
45–49	6,040
50–54	5,370
55–59	4,550
60–64	3,720
65–69	2,960
70–74	2,210

Age group	Population
75–79	1,520
80–84	910
85–89	440
90–94	150
95–99	40
100+	5
Total	**100,035**

Source: Waterhouse et al 1976.

The Māori and non-Māori populations used in Mortality and Demographic Data 2006 are shown in Figure 33, as well as the WHO World Standard Population for comparative purposes.

Figure 33: Māori 2006, non-Māori 2006 and WHO World Standard Populations, by age group



Age-standardisation and Māori rates

As noted above, age-standardisation is intended to make two population groups comparable. Different population standards will produce different mortality rates, different rankings for causes of death and different confidence intervals. For example, a study comparing the WHO population standards used in this publication (as well as the Segi population used previously) and a Māori population standard has shown that the all-cause mortality rate for Māori was higher using the WHO standard, and that the relative rankings of some causes of Māori death (eg, deaths from external causes) were lower (Robson et al 2007).

Confidence intervals

Confidence intervals have been calculated for age-standardised rates at the 95 percent 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 describe how different the estimate could have been if chance had led to a different set of data. Confidence intervals are calculated with a stated probability, typically 95 percent (which would indicate that there is a 95 percent chance that the true value lies within the confidence interval).

Confidence intervals may assist in comparing rates over time. 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 overlap, it is not possible to make any conclusion about the significance of any difference between the rates without conducting a statistical test of difference.

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

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