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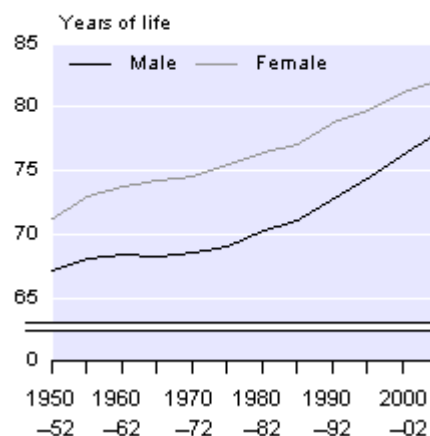
New Zealand Period Life Tables: 2005–07

Highlights

- A newborn girl can expect to live 82.2 years and a newborn boy 78.0 years, based on deaths in New Zealand in 2005–07.
- This is an increase of 1.0 years for females and 1.7 years for males since 2000–02.
- Females can expect to outlive males by 4.1 years based on deaths in 2005–07, down from the largest difference of 6.4 years in 1975–77.
- Māori life expectancy at birth is about 8.2 years lower than for non-Māori. A newborn Māori girl can expect to live 75.1 years and a newborn Māori boy 70.4 years, compared with 83.0 years for a non-Māori girl and 79.0 years for a non-Māori boy.
- The longevity gap between Māori and non-Māori has closed slightly. The difference in life expectancy at birth of 8.2 years in 2005–07 compares with 8.5 years in 2000–02 and 9.1 years in 1995–97.

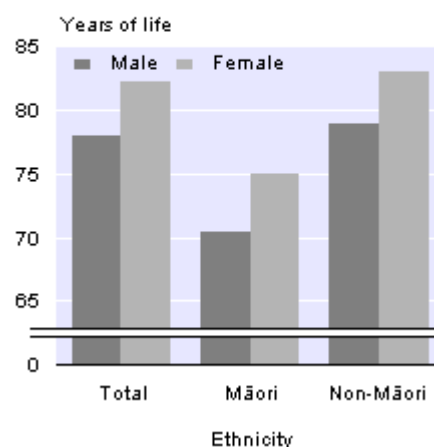
Life Expectancy at Birth

Total population by sex
1950–52 to 2005–07



Life Expectancy at Birth

By ethnicity and sex
2005–07



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Government Statistician

See also [New Zealand Period Life Tables: 2005–07 – Media release.](#)

10 November 2008

Commentary

New Zealand period life tables

This release presents results from the 2005–07 New Zealand (complete) period life tables. Life tables have been produced for the total New Zealand, Māori and non-Māori populations. Official life tables for other ethnic groups, such as the broad Asian and Pacific ethnic groups, are not available because of the relatively small size of these ethnic populations, relatively few death registrations, and uncertainty associated with ethnic identification and measurement. Statistics New Zealand is not yet confident that life tables provide a statistically robust measure of the mortality and survival experience of these ethnic populations for a given period (eg 2005–07) or over time (eg between 2000–02 and 2005–07), other than for Māori and non-Māori.

The period life tables show the mortality and survival experience of the population, based on people dying in the specific period (eg 2005–07). Various life table functions are derived and presented, including life expectancies at birth (age 0) and at other ages. The life expectancies from period life tables assume that people experience the observed mortality rates of the given period throughout their lives. In reality, death rates do not remain constant. Hence, if death rates continue to decrease, people born during 2005–07 will experience greater longevity than implied by the 2005–07 period life tables.

Statistics NZ has recently developed cohort life tables covering the New Zealand population born in each year from 1876. The cohort life tables provide the most authoritative measures of life expectancy actually experienced by the New Zealand population at each age, and are updated and extended each year. For example, the cohort life tables indicate that males and females born in the early 1930s have lived for about 70 and 75 years, respectively, on average. By comparison, it was not until the mid-1970s that period life tables indicated similar life expectancies at birth. Hence, the period life tables measure the life expectancy of the population at a moment in time, but not the actual life expectancy experienced by a birth cohort. More information on the [cohort life tables](#) is available from the Statistics NZ website (www.stats.govt.nz).

Age distribution of deaths

In 2005–07, there were 83,801 deaths of New Zealand residents registered in New Zealand, comprising 41,630 male deaths and 42,171 female deaths.

The median age of the New Zealand population is rising. As a result, the number of deaths at older ages is increasing. Half of male deaths in 2005–07 occurred at age 76 years and over, while half of female deaths occurred at age 82 years and over. In 1975–77, the median age at death was 69 and 75 years for males and females, respectively.

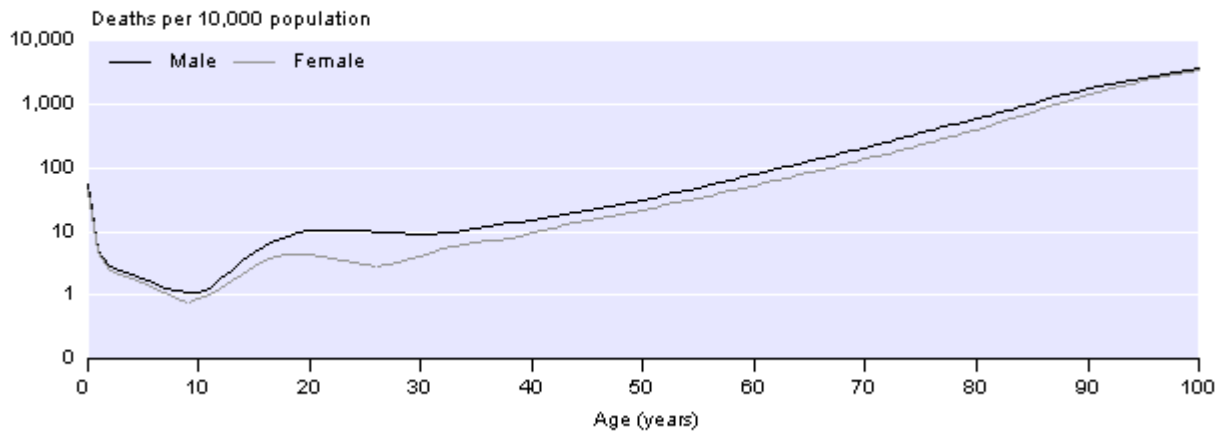
In 1975–77, 5 percent of deaths were among children (those under 15 years). In 2005–07, children accounted for less than 2 percent of deaths. Between the periods 1975–77 and 2005–07, the proportion of male deaths occurring at age 65 years and over increased from 60 to 73 percent. The corresponding female proportion rose from 72 to 82 percent.

Death rates by age

The New Zealand life tables are comparable with other OECD countries. The total population life tables are characterised by relatively high death rates in the first year of life (about 5 deaths per 1,000 live births). Death rates then decrease as age increases and are at their lowest among ages 7–11 years. Death rates then increase to a hump around age 20 years, although this hump is less pronounced for males and more pronounced for females than it was in previous decades. The leading causes of death at ages 15–24 years are external causes such as accidents, violence and poisoning (New Zealand Health Information Service 2007). Death rates then increase gradually with age, reaching 1 death per 100 people for males aged in the early 60s and females aged in the late 60s. For males aged in the mid-80s and females aged in the late 80s, death rates have reached 1 death per 10 people. Females experience lower death rates than males at all ages.

Proportion Dying Within a Year (q_x)

Total population by age and sex
2005–07



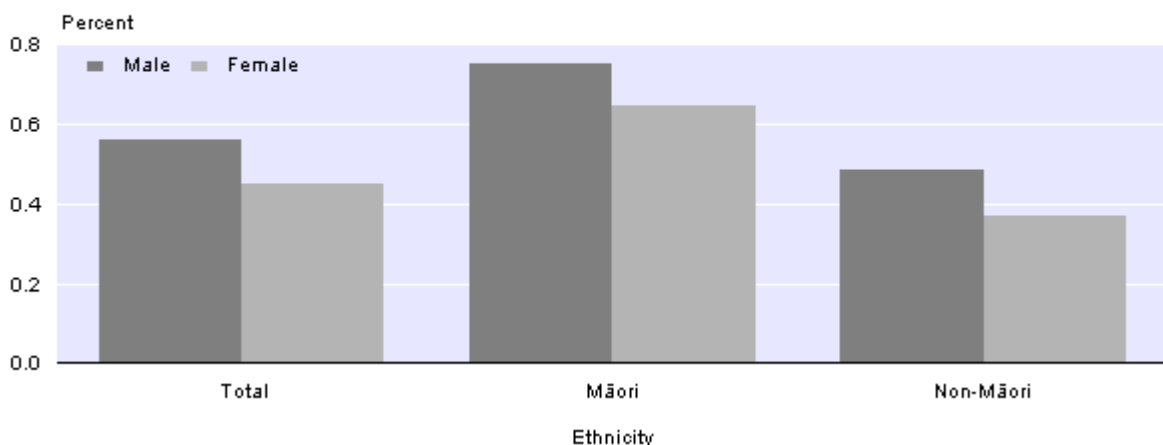
Note: Logarithmic scale

Infant death rates

The proportion of infants dying in the first year of life is about 5 per 1,000 or 0.5 percent (average of male and female). The Māori rate of about 7 per 1,000 (or 0.7 percent) is roughly 1.6 times higher than the non-Māori rate of about 4 per 1,000 (or 0.4 percent).

Proportion Dying Within the First Year of Life (q_0)

By ethnicity and sex
2005–07



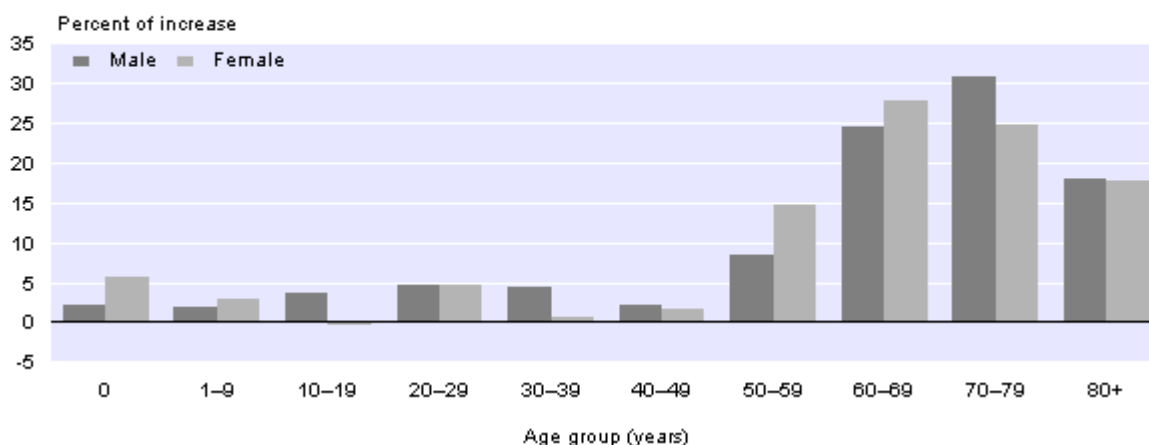
Age contribution to increase in life expectancy at birth

Over the five-year period, 2000–02 to 2005–07, New Zealand life expectancy at birth increased by 1.7 years for males and by 1.0 years for females. Two-thirds of these gains were due to the reduction in death rates among late working and retirement ages (60–84 years). Reduced death rates among men and women aged in their 50s also made a significant contribution. Among females, the age group 15–19 years experienced a small increase in death rates, meaning this age group made a small negative contribution to the longevity gain.

Age Contribution to Increase in Life Expectancy at Birth

Total population by sex

2000–02 to 2005–07

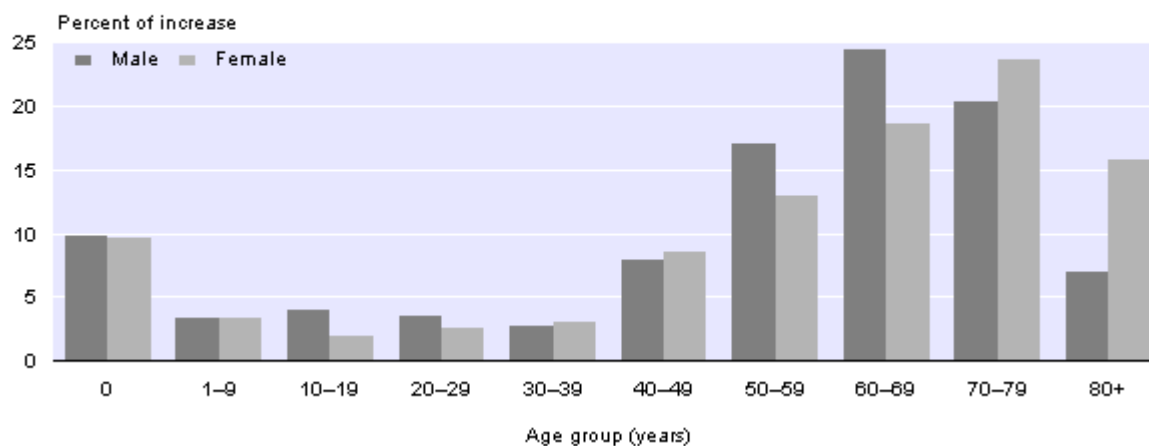


Over a longer 30-year period, 1975–77 to 2005–07, New Zealand life expectancy at birth increased by 9.0 years for males and by 6.7 years for females. The main contribution was again from the reduction in death rates among late working ages (50–64 years) and retirement ages (65–79 years). However, reduced death rates among infants, men and women in their 40s, and women aged 80 years and over were also significant.

Age Contribution to Increase in Life Expectancy at Birth

Total population by sex

1975–77 to 2005–07

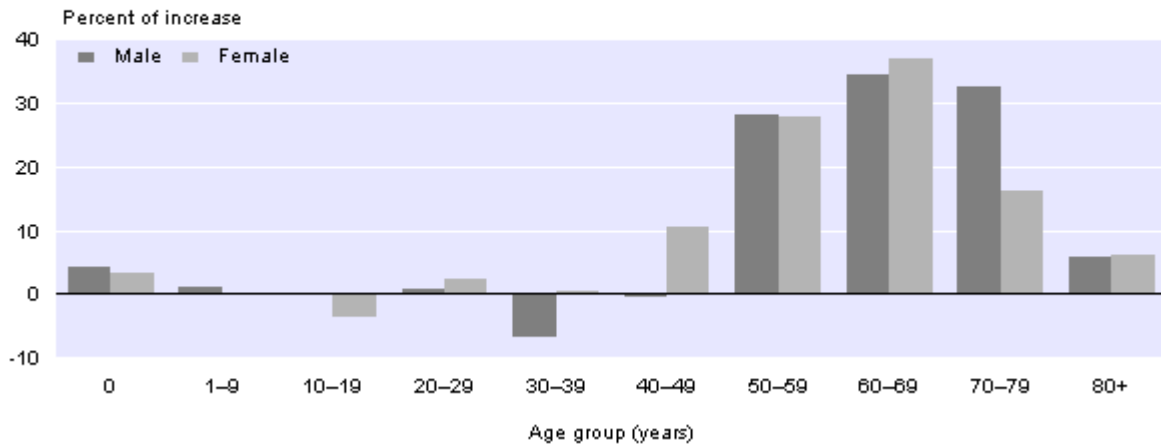


Among Māori, life expectancy at birth increased by 1.4 years for males and by 1.9 years for females between 2000–02 and 2005–07. These gains were due largely to the reduction in death rates among late working ages (50–64 years) and retirement ages (65–79 years). Small increases in death rates were observed at some younger ages.

Age Contribution to Increase in Life Expectancy at Birth

Māori population by sex

2000–02 to 2005–07



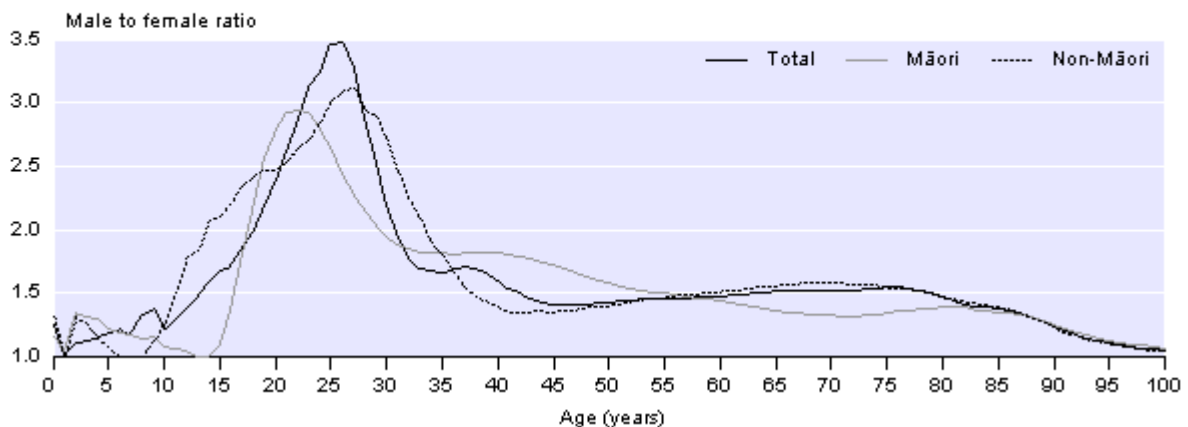
Male/female differentials

For the total population, males experience higher death rates than females at all ages. Males die at more than twice the rate of females at ages 18–30 years, and more than three times that of females at ages 23–27 years. Among Māori, males die at more than twice the rate of females at ages 18–29 years.

Ratio of Male to Female Proportion Dying Within a Year (q_x)

By age and ethnicity

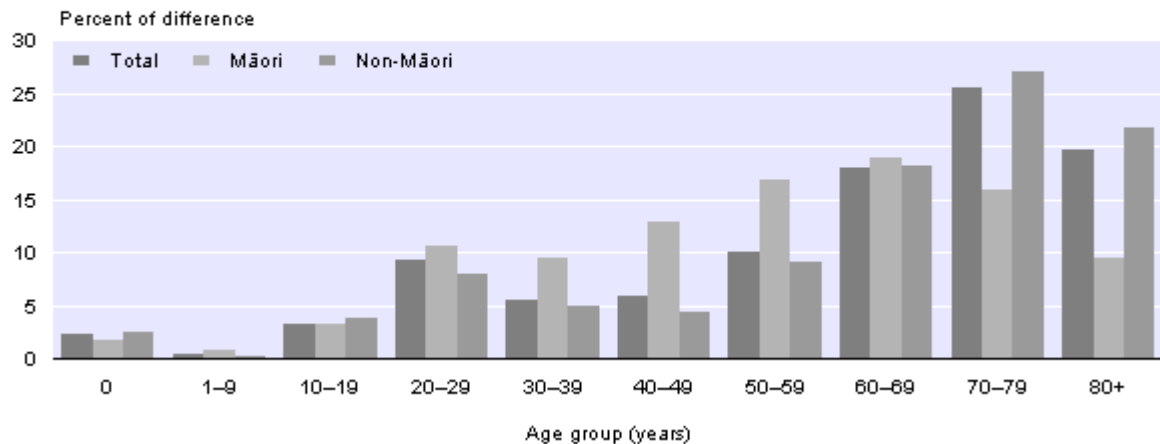
2005–07



In 2005–07, life expectancy at birth for females exceeded that of males by 4.1 years for the total New Zealand population, by 4.7 years for Māori, and by 4.0 years for non-Māori. For the total and non-Māori populations, two-thirds of the difference is due to higher male death rates at ages 55–89 years. For the Māori population, two-thirds of the difference is due to higher male death rates at ages 40–79 years.

Age Contribution to Difference between Male and Female Life Expectancy at Birth

By ethnicity
2005–07



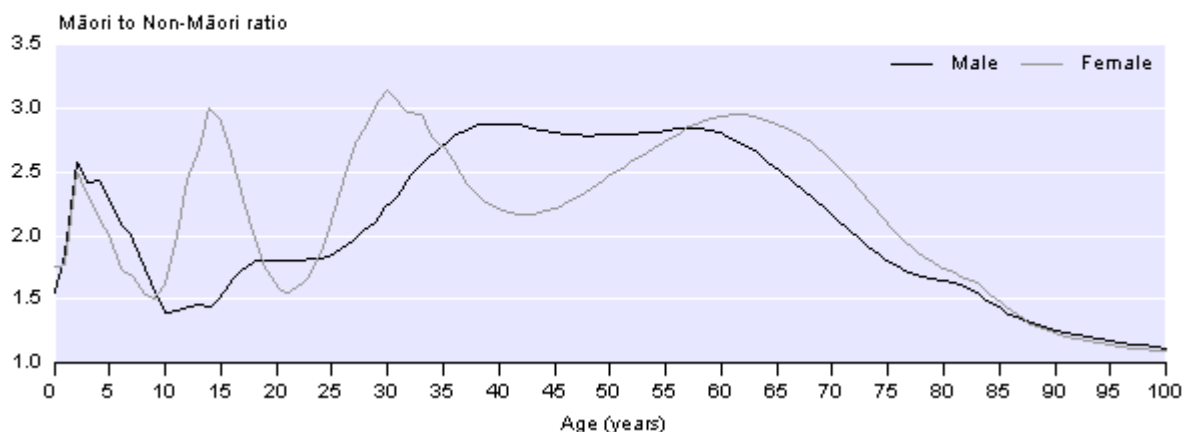
Ethnic differentials

Ethnic data must always be interpreted with caution, partly because ethnic identity can change over time and between different data collections (eg depending on the respondent and the context of the data collection).

Māori experience higher death rates than non-Māori at all ages. Māori die at more than double the rate of non-Māori among males aged 2–6 and 28–72 years, and females aged 2–4, 12–17 and 25–75 years.

Ratio of Māori to Non-Māori Proportion Dying Within a Year (q_x)

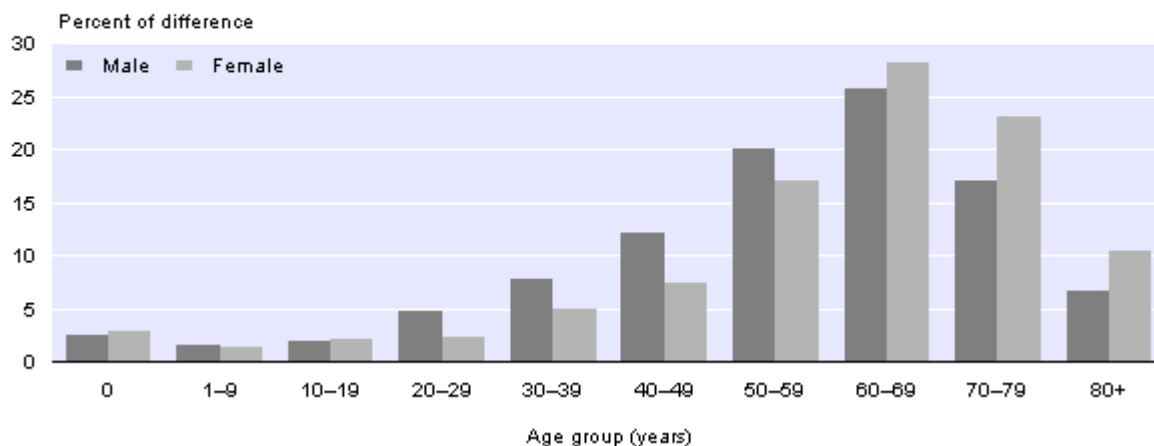
By age and sex
2005–07



As a result of the differences in death rates, life expectancy at birth for non-Māori exceeded that of Māori by 8.6 years for males and by 7.9 years for females in 2005–07. For males, three-quarters of these differences in longevity are due to higher Māori death rates at ages 40–79 years. For females, three-quarters of these differences in longevity are due to higher Māori death rates at ages 50–84 years.

Age Contribution to Difference between Māori and Non-Māori Life Expectancy at Birth

By sex
2005–07



The Māori/non-Māori differential partly reflects different rates of diabetes and smoking, as well as socio-economic differentials. The latest cause-of-death statistics show age-standardised death rates from diabetes were nearly six times higher for Māori than non-Māori in 2004 (New Zealand Health Information Service 2007). The 2006 Census reported that 42 percent of Māori aged 15 years and over were regular smokers, compared with 18 percent of non-Māori.

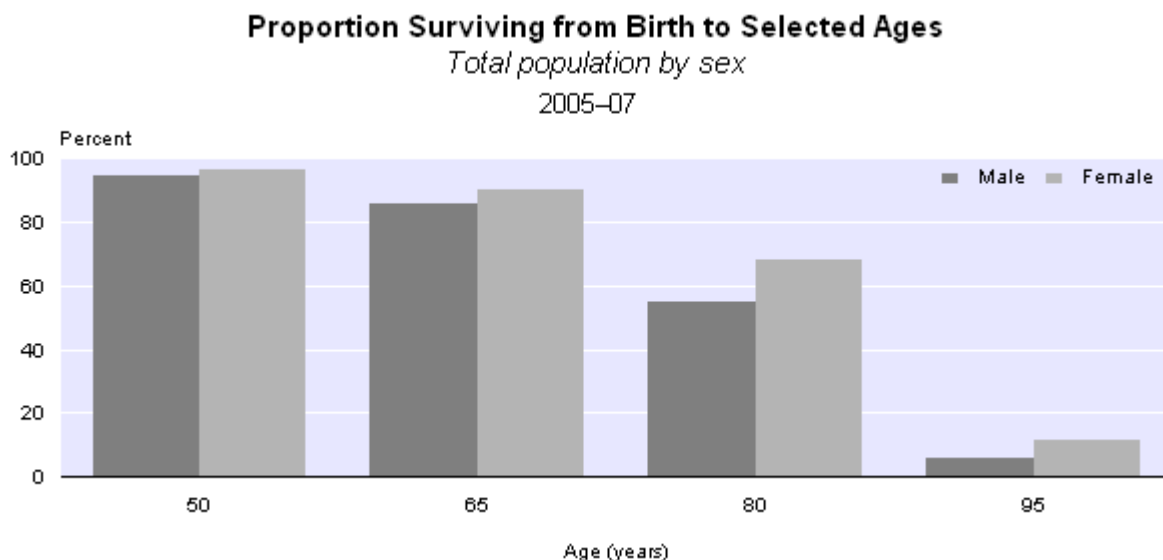
The gap between Māori and non-Māori life expectancy has narrowed. In 1995–97, it stood at 9.1 years (average of male and female). By 2000–02 it had dropped to about 8.5 years. In 2005–07, the gap was 8.2 years.

However, the observed gap for males between Māori and non-Māori life expectancy has fluctuated, dropping from 8.8 years in 1995–97 to 8.2 years in 2000–02, but increasing to 8.6 years in 2005–07. In contrast, the gap for females between Māori and non-Māori life expectancy has dropped from 9.3 years in 1995–97 to 8.8 years in 2000–02 to 7.9 years in 2005–07.

Official life tables are unavailable for other ethnic populations, such as the broad Asian and Pacific populations, partly because of the relatively small size of these ethnic populations and relatively few deaths. Reliable life tables therefore cannot be produced. Nevertheless, other mortality measures, such as age-standardised death rates, indicate that Pacific death rates are part-way between Māori and total death rates, while European and Asian death rates are lower than non-Māori death rates.

Chance of survival

The 2005–07 life tables indicate that 96 percent of newborn babies can expect to reach 50 years of age. About 90 percent of newborn girls and 86 percent of newborn boys can expect to live to 65 years of age. After that, the chance of survival decreases rapidly. About 68 percent of newborn girls and 55 percent of newborn boys can expect to live to 80 years of age. About 11 percent of newborn girls and 6 percent of newborn boys can expect to live to 95 years of age. The chance of reaching 100 years is about 1 in 50 (or 2 percent) for newborn girls and 1 in 110 (or 1 percent) for newborn boys.



International comparison

In 2005–07, New Zealanders' life expectancy at birth was 82.2 years for females and 78.0 years for males. This was slightly below the OECD median of 82.3 years for females and slightly above the OECD median of 77.2 years for males (OECD 2008). Out of 30 OECD countries, New Zealand was ranked 17th for females and ninth for males. In 1960–61, New Zealand's ranking was ninth for females and seventh equal for males. Through the 1960s, 1970s and 1980s, longevity improved faster in many other OECD countries than in New Zealand. Since the 1980s, faster-than-average gains in life expectancy in New Zealand, particularly for males, have improved New Zealand's relative position.

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Technical notes

Life tables

Life tables are one of the basic demographic tools for analysing mortality. They are a tabular numerical representation of mortality and survivorship of a cohort at each age of life. Most life tables are based on current mortality rates, and such tables are called period, current or cross-sectional life tables.

Period life tables assume that as a cohort passes through life, it experiences the age-specific mortality rates of a given period. Although these tables are based on death rates of the population during a particular period of time, they are a hypothetical model of mortality as they do not describe the real mortality which characterises a cohort as it ages.

In contrast, cohort (or generation) life tables are based on the actual mortality experience of a particular cohort (eg all people born in the year 1900). These tables require data over many years, theoretically until the death of the last survivor.

Every five years, Statistics New Zealand produces complete period life tables using average mortality rates for three successive years centred on a census year. A complete life table presents functions for each single-year of age.

In every non-census year, Statistics NZ produces abridged period life tables using mortality rates for three successive years centred on a non-census year. These abridged life tables are an interim indication of mortality and survival trends of the total New Zealand population until complete period life tables are derived. An abridged life table presents functions for five-year age groups rather than by single-year of age, although age 0 and 1–4 years are identified separately.

In 2006, Statistics NZ released complete cohort life tables for the New Zealand population for the first time. These track the mortality and survival trends of people born in each year from 1876, and are updated and extended annually.

Ethnic concept

The ethnic concept used in these period life tables is the ethnic group or groups that people identify with, or feel they belong to. Ethnicity is self-perceived and people can belong to more than one ethnic group. For example, people may identify with the Māori ethnicity even though they may not be descended from a Māori ancestor. Conversely, people may choose to not identify with the Māori ethnicity even though they are descended from a Māori ancestor. Ethnicity does not equate to a birthplace description.

Changes to birth and death registration forms

In September 1995, new birth and death registration forms were introduced carrying a revised question on ethnicity. Previously the ethnic question on the death registration form asked for the degree of Māori or Pacific Island blood, if any, of the deceased person's parents. The new ethnic question, which is the same in principle to the ethnic question used in the 1996 Census, instructs the respondent to "tick as many circles as needed to show which ethnic group(s) deceased belonged to". This has resulted in a number of changes:

- the ethnic concept is now self-identified ethnicity (previously Māori and Pacific respondents were classified by their 'degree of blood')
- ethnic vital statistics are now available for a wider range of ethnic groups (previously information was only sought for Māori and Pacific groups)
- ethnic data is now directly available for newborn babies and the deceased (in both cases this was previously derived from their parent's ethnicity)
- multiple response to the ethnicity question is now possible
- non-response to the ethnicity question can now be quantified.

In the case of births and deaths, ethnicity is identified by the person completing the registration form. For births this is usually the parent(s), while for deaths this is most likely to be the funeral director (on the advice of a family member).

Availability and comparability of ethnic life tables

Statistics NZ has produced period life tables for the Māori and non-Māori populations in addition to period life tables for the total New Zealand population. Following the introduction of new birth and death registration forms in September 1995, Statistics NZ has also evaluated the production of life tables for other ethnic groups such as Asian and Pacific. However, official life tables for other ethnic groups have not been produced because of the relatively small size of these ethnic populations, relatively few death registrations, and uncertainty associated with ethnic identification and measurement. For example, a person's ethnic identity can change over time and between different data collections, depending on the respondent and the context of collection. Hence, Statistics NZ is not yet confident that life tables provide a statistically robust measure of the mortality and survival experience of these ethnic populations for a given period (eg 2005–07) or over time (eg between 2000–02 and 2005–07), other than for Māori and non-Māori. All ethnic mortality measures, including those for Māori and non-Māori, should be interpreted with due caution.

Customised and non-official life tables for the Pacific and 'European or Other (including New Zealander)' ethnic groups are available on request from Statistics NZ. For more information and quotes email demography@stats.govt.nz.

There is evidence that Māori deaths were significantly under-reported, and hence non-Māori deaths were over-reported, before the new vitals registration forms were introduced in 1995. Following the redesign of the forms, death registrations and population data are broadly comparable for ethnic groups. The 1995–97 Māori and non-Māori life tables published in July 1998 were the first to be constructed using data derived from the new registration forms. However, because numerator-denominator ethnic differences are significant before 1995–97, ethnic mortality measures from 1995–97 are not comparable with those from earlier years. For alternative estimates of life expectancy of different ethnic populations before 1995–97, see Ajwani (2003). Note, however, that these estimates may not be directly comparable to mortality measures produced by Statistics NZ because of differences in both the deaths numerator and population denominator.

Method

The data used to construct the 2005–07 life tables comprises:

1. deaths registered in New Zealand of people resident in New Zealand in the December years 2005–07, respectively, by single-year of age, sex and ethnicity
2. the estimated resident population of New Zealand at 30 June 2006 by single-year of age, sex and ethnicity.

Deaths numerator

The life tables are compiled from deaths registered, rather than deaths occurring, in each respective three-year period. Most death statistics refer to registrations rather than occurrences for a given time period, because there is generally a time lag between when the death occurred and when it is registered. Hence, the number of death registrations can be determined before the number of death occurrences for a given time period. For periods of a year or more, the difference between registrations and occurrences is generally small, so death statistics referring to registrations are suitable for most purposes.

An allowance for ethnic non-response among deaths has been made. There was no response to the ethnicity question for 4.9 percent of deaths in 2005–07.

Because deaths in the first year of life are skewed towards the early part of this age, infant death rates are calculated from more detailed data. This involves the division of the first year of life into more detailed ages. The reports *New Zealand Life Tables, 2000–2002* (Statistics NZ, 2004) and *New Zealand Period Life Tables: 2005–07* (Statistics NZ, forthcoming) describe the methodology in more detail.

Population denominator

The estimated resident population at 30 June 2006 is based on the census usually resident population count at 7 March 2006 with adjustments for:

1. non-response to the census ethnicity question
2. net census undercount
3. residents temporarily overseas on census night
4. births, deaths and net migration between census night and 30 June of the census year
5. reconciliation with demographic estimates at ages 0–4 years.

The 2006 Census asked people "Which ethnic group do you belong to? Mark the space or spaces which apply to you". The census usually resident population count of 4,027,947 included 565,329 who identified with the Māori ethnicity and 167,784 who gave no specific ethnic response. The 2005–07 life tables use as a population denominator the estimated resident population of each ethnic group of New Zealand at 30 June 2006. New Zealand's estimated resident population of 4,185,000 included 624,000 who identified with the Māori ethnicity.

Because of changes to the census ethnicity question between 1996 and 2001, the 1996 and 2001 population estimates for ethnic groups are not necessarily comparable. Nevertheless, the derived mortality measures presented here are considered to give a statistically satisfactory description of Māori and non-Māori mortality experience during the 1995–97 and 2000–02 periods. Note that all population estimates used in the 1995–97 and 2000–02 life tables have been derived using the same methodology. In addition, the ethnicity question used in the 1996 Census is the same as that used in birth and death registration forms from September 1995. The use of population estimates based on the 1996 Census also allows the adjustment ratios presented in Ajwani (2003) to be incorporated.

For more information about the estimated resident population, refer to [Information about the population estimates](#) on the Statistics NZ website (www.stats.govt.nz).

Usually the mean population of each period is used as the denominator to calculate death rates. However, mean population estimates are not available for all ethnic populations. To ensure consistency of method among all population subgroups, the estimated population at 30 June (the midpoint) of each period is used. The impact of using 'midpoint' rather than 'mean' population estimates is generally insignificant.

Derived rates

The life tables are based on deaths averaged over three years. This is designed to reduce the impact of year-to-year statistical variations, particularly at younger ages where there is a small number of deaths and at very old ages where the population at risk is small. In some cases the New Zealand data does not enable death rates to be reliably estimated at all ages. For most ages above 90 years, death rates of the total New Zealand population have been modelled on the mortality trends of other countries such as Australia, Canada, Japan, the United Kingdom and the United States. For the Māori and non-Māori populations, death rates have also been modelled at some younger ages.

There are some small observed numerator-denominator ethnic differences since 1995 in comparison with 1996, 2001 and 2006 census data. For the 2000–02 and 2005–07 life tables, these estimated differences are not significant enough to reliably adjust death numbers by age, sex and ethnicity. For the 1995–97 life tables, the smooth adjustment factors presented in Ajwani (2003) have been applied to Māori deaths by age, to allow for under-reporting of Māori deaths (relative to the Māori population). For the non-Māori life tables, corresponding adjustments have been applied to non-Māori deaths by age. These adjustment factors affect Māori life expectancy at birth by about 0.7 years and non-Māori life expectancy at birth by about 0.1 years.

For more information about life tables, refer to [Information about the life tables](#) on the Statistics NZ website (www.stats.govt.nz).

Forthcoming information

Statistics New Zealand produces abridged period life tables on an annual basis. These are not as detailed as complete life tables, as abridged life tables present functions for grouped ages rather than single years of age, and are not derived by ethnicity. Abridged period life tables for 2006–08 will be available in February 2009 (provisional) and May 2009 (final).

More details on life table methodology and results relating to New Zealand subpopulations will be included in the publication *New Zealand Period Life Tables: 2005–07* which will be released in the first half of 2009.

Definitions

Cohort: a group of people sharing a common demographic experience. For example, the 1900 birth cohort refers to the people who were born in the year 1900.

Estimated resident population: an estimate of all people who usually live in a given area at a given date. The estimated resident population of New Zealand includes all residents present in New Zealand and counted by the census ('census usually resident population count'), residents who are temporarily overseas (who are not included in the census), and an adjustment for residents missed or counted more than once by the census (net census undercount). Visitors from overseas are excluded.

The estimated resident population at a given date after census includes births, deaths and net migration (arrivals less departures) of residents during the period between census night and the given date.

Life expectancy: the average length of life remaining at a given age. As derived from a period life table, it assumes that a person experiences the age-specific mortality rates of a given period from the given age onwards.

Life expectancy at birth: the average length of life of a birth cohort. As derived from a period life table, it is the average length of life of a newborn baby, assuming they experience the age-specific mortality rates of a given period throughout their life.

Life table: a tabular numerical representation of mortality and survivorship of a cohort of births at each age of life.

A complete life table presents life table functions for each single year of age, while an abridged life table presents life table functions for age groups.

The period life tables presented here assume that as a cohort passes through life it experiences the age-specific mortality rates of a given period. Although they are usually based on death rates from a real population during a particular period of time, these tables are a hypothetical model of mortality as they do not describe the real mortality which characterises a cohort as it ages.

Māori population: as used here, refers to people who identify with the Māori ethnicity, with or without other ethnicities. Because ethnicity is self-perceived, people can identify with Māori ethnicity even though they may not be descended from Māori ancestors. Conversely, people may choose to not identify with Māori ethnicity even though they are descended from Māori ancestors.

Mean population: the average number of people in an area during a given period, usually a year. This measure may be estimated in terms of a simple or weighted arithmetic mean of monthly or quarterly population during the reference period.

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Tables

The following tables can be downloaded from the Statistics New Zealand website as an Excel spreadsheet. If you do not have access to Excel, you may use the [Excel file viewer](#) to view, print and export the contents of the file.

1. Life expectancy at selected ages, total population
2. Life expectancy at selected ages, Māori population
3. Life expectancy at selected ages, Non-Māori population
4. Total male population period life table, 2005–07
5. Total female population period life table, 2005–07
6. Māori male population period life table, 2005–07
7. Māori female population period life table, 2005–07
8. Non-Māori male population period life table, 2005–07
9. Non-Māori female population period life table, 2005–07