

## 1.14 Life expectancy at birth

*The life expectancy of Aboriginal and Torres Strait Islander males and females for a given period*

### Data sources

Life expectancy estimates presented in this measure are from the ABS and are based on population estimates based on the 2001 Census of Population and Housing. Data on potential years of life lost before age 65 years are calculated by the AIHW and are derived from the AIHW National Mortality Database.

### Life expectancy estimates

Life expectancy refers to the average number of years a person of a given age and sex can expect to live, if current age- and sex-specific death rates continue to apply throughout his or her lifetime.

Estimates of life expectancy are drawn from life tables. To construct a life table, data on total population, births and deaths are needed, and the accuracy of the life table depends upon the completeness of these data. Because of uncertainty about the estimates of these components for Aboriginal and Torres Strait Islander peoples, experimental methods are used to calculate life expectancies for the Indigenous population. These life expectancies should only be used as an indicative summary measure of life expectancy of the Indigenous population.

The Bhat method was used by the ABS to construct a model life table for the Indigenous population which gives an estimation of life expectancy at birth. This method offers improvement over other indirect methods used earlier by the ABS to estimate life expectancy from incomplete data, such as the Preston and Hill (1980) method. While the Bhat method allows for an adjustment for changes in identification to be taken into account in the estimation of life expectancy, it remains experimental and therefore work needs to be done on such estimates as more robust methods become available.

The ABS has recently produced experimental Indigenous life tables for the 1996–2001 period. To produce reliable age-specific death rates, states with a small number of Indigenous deaths were grouped together with others on the basis of geographic proximity (that is, Victoria with New South Wales, and South Australia with Western Australia). Due to the small number of registered Indigenous deaths, Indigenous life tables were not produced for Tasmania and the Australian Capital Territory. Mortality estimates for New South Wales and Victoria (combined) were used to produce Indigenous population estimates and projections for Tasmania and the Australian Capital Territory.

### Mortality

The National Mortality Database is a national collection of de-identified information for all deaths in Australia and is maintained by the AIHW. Information on the characteristics and causes of death of the deceased is provided by the Registrars of Births, Deaths and Marriages and coded nationally by the ABS. Information on the cause of death is supplied by the medical practitioner certifying the death, or by a coroner. The data are updated each calendar year.

While the identification of Indigenous deaths is incomplete in all state and territory registration systems, four jurisdictions (Queensland, Western Australia, South Australia and the Northern Territory) have been assessed by the ABS and the AIHW as having adequate identification. These four jurisdictions represent approximately 60% of the Indigenous population of Australia. Data are presented by state/territory of usual residence rather than state/territory where death occurs.

Deaths for which the Indigenous status of the deceased was not reported have been excluded from the analysis.

Data have been combined for the five-year period 2000–04 due to the small number of deaths from some conditions each year. Data have been analysed using the year of occurrence of death for the period 2000–2003 and year of registration of death for 2004. This is because mortality data by year of occurrence of death more accurately reflect mortality during a particular year than year of registration data, however, year of occurrence data for 2004 are still incomplete owing to late registrations.

## Analyses

### Life expectancy

- Over the period 1996–2001, the life expectancy at birth for Indigenous people was estimated to be around 59 years for males and 65 years for females. This was some 17 years lower than life expectancy estimates for the total Australian population for the period 1999–2001 (77 years for males and 82 years for females) (Table 1.14.1 and Figure 1.14.1).
- Life expectancy was lowest for Indigenous males in the Northern Territory (58 years) and for Indigenous females in Queensland (63 years).

A study of causes of the inequality in life expectancy between Indigenous and non-Indigenous Australians in the Northern Territory found that the main contributors to the gaps in life expectancy are non-communicable diseases including conditions such as respiratory diseases, cardiovascular diseases and diabetes. These conditions are more prevalent in ageing populations. The study also found that communicable diseases, maternal, perinatal and nutritional conditions and injury contributed far less to the life expectancy gap (Zhao & Dempsey 2006).

**Table 1.14.1: Life expectancy at birth, Indigenous 1996–2001, total population 1999–2001<sup>(a)(b)</sup>**

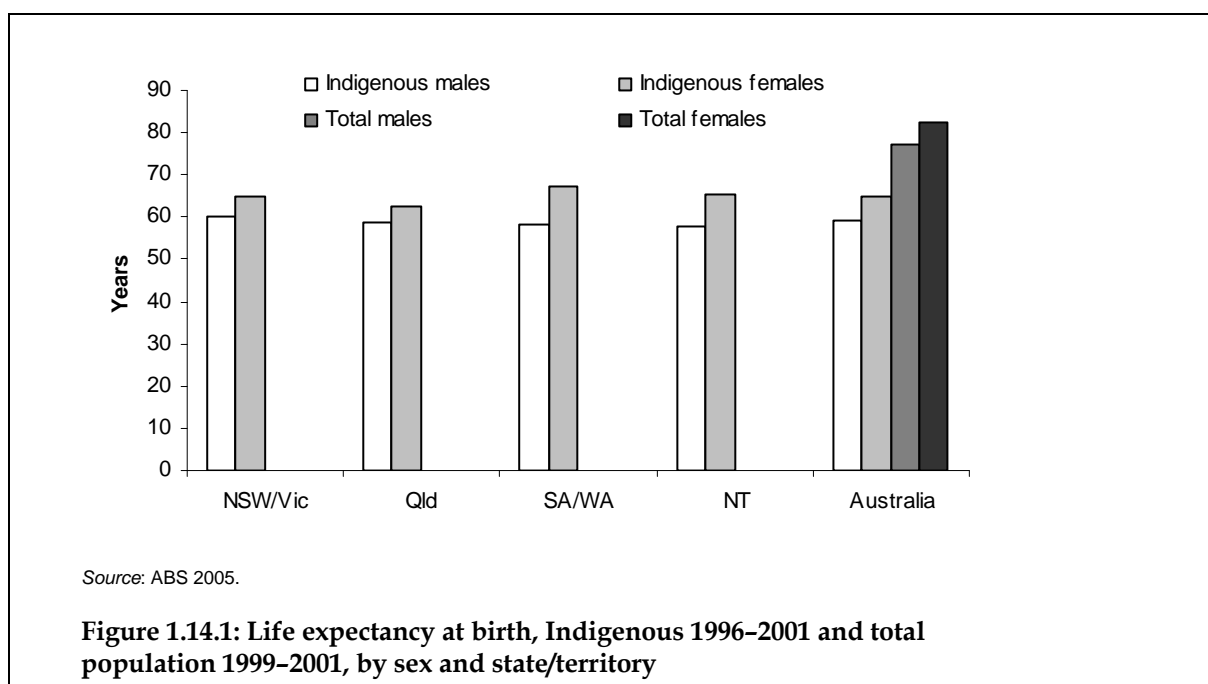
|                                   | <b>Males</b>            | <b>Females</b> |
|-----------------------------------|-------------------------|----------------|
|                                   | <b>Indigenous</b>       |                |
| New South Wales/Victoria          | 60.0                    | 65.1           |
| Queensland                        | 58.9                    | 62.6           |
| South Australia/Western Australia | 58.5                    | 67.2           |
| Northern Territory                | 57.6                    | 65.2           |
| <b>Australia<sup>(c)</sup></b>    | <b>59.4</b>             | <b>64.8</b>    |
|                                   | <b>Total population</b> |                |
| New South Wales                   | 76.9                    | 82.4           |
| Victoria                          | 77.5                    | 82.7           |
| Queensland                        | 76.9                    | 82.3           |
| Western Australia                 | 77.3                    | 82.8           |
| South Australia                   | 77.0                    | 82.5           |
| Tasmania                          | 76.0                    | 81.2           |
| Australian Capital Territory      | 78.5                    | 82.9           |
| Northern territory                | 70.8                    | 76.5           |
| <b>Australia</b>                  | <b>77.0</b>             | <b>82.4</b>    |

(a) For Tasmania and Australian Capital Territory estimates for the Indigenous population, use New South Wales/Victoria estimates.

(b) Variations in life expectancies by Indigenous status, sex and jurisdiction should be interpreted with care as they are sensitive to differential data quality.

(c) Includes all states and territories.

Sources: ABS 2005; SCATSIH & SIMC 2006.



## International comparisons

International Indigenous data are available for New Zealand, the United States and Canada.

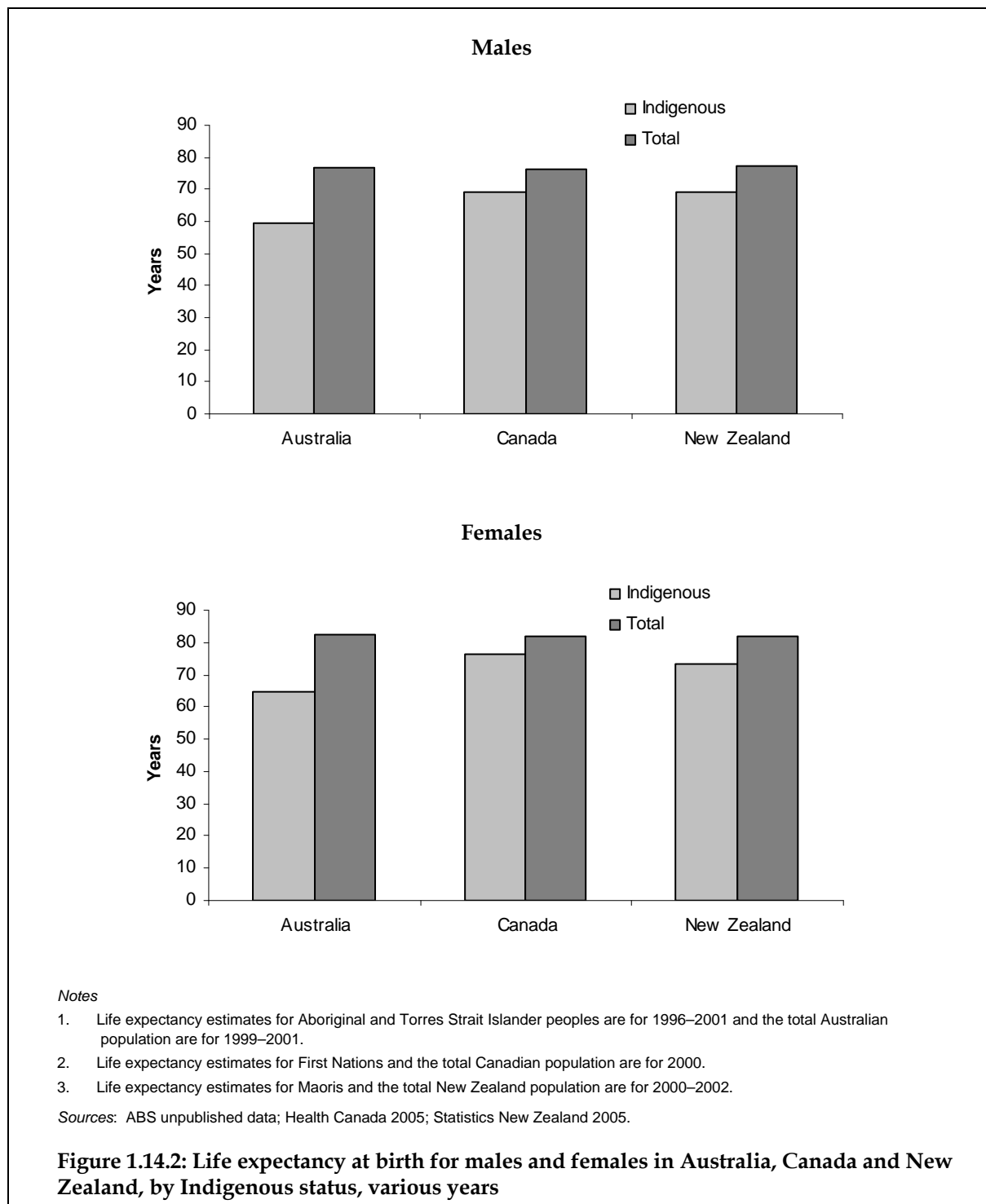
There are several common issues that adversely affect the quality of Indigenous mortality data in these three countries and Australia. These include the lack of an accurate denominator for the Indigenous population (mainly due to undercounting) and the lack of agreement over which is the best population denominator to use when they exist (for example, whether to use single ethnic response groups or multiple ethnic response groups). There are differences in how Indigenous status is defined in the different countries. There have also been frequent modifications to the ethnicity question recorded in the censuses in some of these countries. These changes in the census ethnicity question have led to difficulties in comparing mortality trends over time and have also produced difficulties in estimating inter-census population denominator counts.

An important issue in relation to the quality of Indigenous mortality data is the undercounting of deaths (the numerator for mortality data). In each of the four countries, the undercounting of Indigenous deaths is likely to lead to an underestimation of the relative size of disparities that exist between Indigenous and non-Indigenous populations. This will affect life expectancy estimates.

The life expectancy estimates presented below are not strictly comparable due to differences in the methods used to estimate life expectancy. Moreover, the populations covered by these estimates are variable across the three countries.

- The estimated life expectancy of Aboriginal and Torres Strait Islander males and females was much lower than that reported for Maori people in New Zealand and First Nation Indigenous people in Canada (Figure 1.14.2).
- The life expectancy for Maoris for 2000–02 was 69.0 years for males and 73.2 years for females (Statistics New Zealand 2005), while the life expectancy of Canadian First Nations people in 2000 was 68.9 years for males and 76.6 years for females (Health Canada 2005). Life expectancy at birth is not readily available for American Indians in the United States. The most recent published data on the life expectancy of American

Indians are projected life expectancies for 1999 to 2100. In 1999, the projected life expectancy for American Indian males was 72.8 compared to 74.0 for total males, and 82.0 for American Indian females compared to 79.7 for total females (based on low series population estimates) (National Projections Program, Population Division, US Census Bureau, 2000).



## Years of potential life lost

Potential years of life lost (PYLL) is an indicator of premature mortality. It represents the total number of years not lived before a given age (for example, 65 years). This indicator gives more importance to the causes of death that occurred at younger ages than those that occurred at older ages.

The PYLL due to death is calculated for each person who died before age 65 years. Deaths occurring in individuals aged 65 years or older are not included in the calculation. Potential years of life lost correspond to the sum of the PYLL contributed for each individual. The rate is obtained by dividing total potential years of life lost by the total population less than 65 years of age.

Table 1.14.2 presents the number and rate of potential years of life lost for Indigenous and non-Indigenous Australians over the period 2000–2004.

- Between 2000 and 2004, approximately 74% of Indigenous males and 64% of Indigenous females died before the age of 65 years. This compared to 26% of non-Indigenous males and 16% of non-Indigenous females.
- For the period 2000–2004, there were 83,269 and 51,803 years of potential life lost before the age of 65 years for Indigenous males and females respectively.
- The rate of potential years of life lost per 1,000 population was 108.8 for Indigenous males and 67.0 for Indigenous females. This compared to 33.8 per 1,000 population for non-Indigenous males and 18.7 per 1,000 population for non-Indigenous females.
- An average of 25–26 years of life were lost before the age of 65 years for every death of Indigenous males and females over the period 2000–2004, compared to 18 years for non-Indigenous males and females.

**Table 1.14.2: Potential years of life lost before age 65 years (PYLL), 2000–2004<sup>(a)(b)(c)</sup>**

|                       | Deaths aged under 65 years |             | PYLL (65) |                               |               |
|-----------------------|----------------------------|-------------|-----------|-------------------------------|---------------|
|                       | No.                        | % of deaths | No.       | Rate per 1,000 <sup>(d)</sup> | No. per death |
| <b>Indigenous</b>     |                            |             |           |                               |               |
| Males                 | 3,154                      | 74.0        | 83,269    | 108.8                         | 26.4          |
| Females               | 2,060                      | 64.1        | 51,803    | 67.0                          | 25.1          |
| <b>Non-Indigenous</b> |                            |             |           |                               |               |
| Males                 | 30,991                     | 26.2        | 569,819   | 33.8                          | 18.4          |
| Females               | 16,962                     | 15.9        | 305,834   | 18.7                          | 18.0          |

(a) While most deaths of Indigenous Australians are registered, it is likely that some are not accurately identified as Indigenous. Therefore, these statistics are likely to underestimate the Indigenous PYLL.

(b) Data are reported for Queensland, Western Australia, South Australia and the Northern Territory only. These jurisdictions are considered to have adequate levels of Indigenous identification in mortality data. They do not represent a quasi-Australian figure.

(c) Data are based on year of occurrence of death for 2000–2003 and year of registration of death for 2004.

(d) Rate per 1,000 population.

Source: AIHW National Mortality Database.

## **Data quality issues**

### **Life expectancy estimates**

*Estimates of life expectancy are drawn from life tables. To construct a life table, data on total population, births and deaths are needed, and the accuracy of the life table depends upon the completeness of these data. Because of uncertainty about the estimates of these components for Aboriginal and Torres Strait Islander peoples, experimental methods are used to calculate life expectancies for the Indigenous population. These experimental life expectancies should only be used as an indicative summary measure of life expectancy of the Indigenous population.*

*The Bhat method differs from other indirect methods used earlier by the ABS to estimate life expectancy from incomplete data such as the Preston Hill method. While the Bhat method allows for an adjustment for changes in identification to be taken into account in the estimation of life expectancy, it remains experimental and therefore more work needs to be done on such estimates as more robust methods become available.*

### **Births and deaths**

#### ***Indigenous status question***

*All jurisdictions comply with the standard wording for the Indigenous status question and categories for their birth and death registration forms. However, New South Wales, Victoria, South Australia, the Northern Territory and the Australian Capital Territory all have slightly different wording to the national standard for the instruction on those with both Aboriginal and Torres Strait Islander origin (ABS & AIHW 2005). While the wording is only slightly different, it would be ideal to have all jurisdictions asking the question in exactly the same way.*

#### ***Under-identification***

*Almost all births and deaths in Australia are registered. However, the Indigenous status of the person is not always recorded/recorded correctly. The incompleteness of Indigenous identification means the number of births and deaths registered as Indigenous is an underestimate of births and deaths occurring in the Aboriginal and Torres Strait Islander population. As a result, the observed differences between Indigenous and non-Indigenous rates are under-estimates of the true differences.*

*While the identification of Indigenous deaths is incomplete in all states and territory registration systems, four jurisdictions (Queensland, Western Australia, South Australia and the Northern Territory) have been assessed by the ABS and the AIHW as having adequate identification. Longer term mortality trend data are limited to three jurisdictions (Western Australia, South Australia and the Northern Territory) with 10 years of adequate identification of Indigenous deaths in their recording systems. The quality of the time series data is also influenced by the late inclusion of a not stated category for Indigenous status in 1998. Prior to this time, the not stated responses were probably included in with the non-Indigenous. Note that as the data quality improves, the states and territories to be included here should be reviewed.*

*The ABS calculated the implied coverage (identification) of Indigenous deaths for the period 2000–2004 using experimental population estimates: New South Wales – 46%, Victoria – 35%, Queensland – 53%, South Australia – 66%, Western Australia – 72%, Northern Territory – 94%, Tasmania and the Australian Capital Territory were not calculated due to small numbers, Australia – 57% (ABS 2005).*

*(continued)*

## **Data quality issues (continued)**

### ***Numerator and denominator***

*Life expectancy calculations rely on good numerator and denominator estimates. The numerator and denominator are not based on the same collection or the same method of collection. Births are registered by the parents while death registration forms are completed by doctors and funeral directors. Therefore there would be inconsistency of Indigenous identification in the numerator and denominator. The changes in the completeness of identification of Indigenous people in birth and death records may take place at different rates than changes in the identification of Indigenous people in other administrative collections and population estimates (ABS 2004).*

### ***International comparisons***

*International Indigenous data are available for New Zealand, the United States and Canada.*

*In New Zealand, research has been undertaken that attempts to adjust for this undercounting by a process of probabilistic record linkage of death registration data with census data. This research has produced estimates of the considerable extent of the undercounting of Maori deaths. This adjusted data could not be used in international comparisons unless the data in the other countries were also adjusted (Bramley et al. 2004).*

*In Canada the national mortality database administered by Statistics Canada does not contain ethnicity data. The regional offices of Health Canada collect mortality data for the Indigenous, on-reserve, First Nations population. Via a series of partnerships with each provincial vital statistics registrar, First Nations specific death certificate information is sent to the regional First Nations and Inuit Health Branch regional office. However, in a number of areas no such relationships exist (for example, the Atlantic, Ontario, and Quebec regions), and therefore data are obtained directly from the local communities, or not at all. The availability of Indigenous mortality data in Canada is further limited by the lack of information for off-reserve, or non-status, Indigenous peoples.*

*The varying degrees of completeness and accuracy of the Indigenous mortality databases that exist within the four countries are likely to affect the comparisons.*

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