Overview of Australian Indigenous health status
November 2008

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November 2008

Australian Indigenous Health InfoNet
Perth, Western Australia
Overview of Australian Indigenous health status, November 2008

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Australian Indigenous HealthInfoNet

The Australian Indigenous HealthInfoNet’s mission is to contribute to improvements in Indigenous health by making relevant, high quality knowledge and information easily accessible to policy makers, health service providers, program managers, clinicians, researchers and the general community.

The HealthInfoNet addresses this mission by undertaking research into various aspects of Indigenous health and disseminating the results (and other relevant knowledge and information) mainly via its Internet site (www.healthinfonet.ecu.edu.au). The HealthInfoNet’s research mainly involves analysis and synthesis of data and other information obtained from academic, professional, government and other sources, but it also undertakes some primary data collection and analysis.

The HealthInfoNet is a world leader in knowledge/research translation/transfer, the area of research which aims at transferring the results of pure and applied research into practice. In this research, the HealthInfoNet addresses the knowledge needs of its wide range of potential users.

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</table>
Preface

This overview has been prepared by the Australian Indigenous HealthInfoNet as a part of our efforts to contribute to improvements in Australian Indigenous health by making relevant, high quality knowledge and information easily accessible to policy makers, health service providers, program managers, clinicians, researchers and the general community.¹

The main purpose of the overview is to provide a comprehensive summary of the most recent indicators of the health of Indigenous people. It is beyond the scope of the overview to analyse trends in the various indicators, so it tends to draw attention to the persisting poor health status of Australia’s Indigenous peoples. It is important to acknowledge that some improvements have occurred in Indigenous health status – a brief summary of improvements is provided in the section entitled ‘Concluding comments’.

Research for the overview involved the collection, collation, and analysis of a wide range of relevant information, including both published and unpublished material. Sources included government reports, articles in journals and other periodicals, books and book chapters, and reports from specific studies and projects.

The overview draws on information from the main administrative data collections (such as the birth and death registration systems and the hospital inpatient collections) and national surveys. Information from these sources has been published mainly in government reports, particularly those produced by the Australian Bureau of Statistics (ABS) and the Australian Institute of Health and Welfare (AIHW).

Importantly, the overview draws also on a wide variety of other information sources, including registers for specific diseases and other conditions, regional and local surveys, and numerous epidemiological and other studies examining particular diseases, conditions, and health determinants. Information from these sources is disseminated mainly through journals and similar periodicals, or in special reports (such as the annual reports of the Australia and New Zealand Dialysis and Transplant Registry (ANZDATA)).

A number of sections include the results of our own analyses of data obtained from a variety of sources. For example, estimates of the age-adjusted incidence of end-stage renal disease were made using notification data published by ANZDATA. Similarly, information about a number of communicable diseases was derived from data published by the National Centre for HIV Epidemiology and Clinical Research.

The initial sections provide information about the Indigenous population and various measures of population health status. Most sections about specific health conditions comprise an introduction about the condition and evidence of the current burden of the condition among Indigenous people.

Further information about the aspects summarised in this overview are included in the corresponding sections of the HealthInfoNet’s website (www.healthinfonet.ecu.edu.au), on which updated versions of this overview will be made available.

We welcome your comments and feedback about the overview.

Neil Thomson, Director, on behalf of the HealthInfoNet team

¹ The term ‘Indigenous’ is used in this overview to refer generally to the two Indigenous populations of Australia – Australian Aboriginal people and Torres Strait Islanders.
Acknowledgements

Particular thanks are extended to:

- staff of the Australian Indigenous HealthInfoNet for their assistance, support and encouragement in the preparation of this overview; and
- the Office for Aboriginal and Torres Strait Islander Health (OATSIH) within the Australian Department of Health and Ageing for their ongoing support of the work of the HealthInfoNet.
Introduction

This overview of Australian Indigenous health draws largely on published information, some of which has been re-analysed to provide clearer comparisons between Indigenous and non-Indigenous people (for more details of statistics and methods, readers should refer to the original sources). Very little information is available separately for Australian Aboriginal people and Torres Strait Islanders, so no attempt has been made to provide separate summaries for these two sub-groups of the Indigenous population.

Limitations of the sources of Indigenous health information

The assessment of Indigenous health status requires accurate information about the size of the population and the numbers of specific health conditions/occurrences. This information is required at national, regional, and local level (for more information about the assessment of population health status, see [1]).

There have been some improvements in recent years – both in estimates of the Indigenous population (the denominator for calculation of rates) and in the availability of data for a number of health conditions/occurrences (the numerators) – but there is still some uncertainty in most areas.

The Australian Bureau of Statistics (ABS) and the Australian Institute of Health and Welfare (AIHW) have been working with State and Territory authorities in recent years to improve the accuracy of Indigenous status in a number of health-related collections, including birth and death registrations, hospital administrative data, and the maternal/perinatal collection. Attention has been directed also to the data collections related to communicable diseases, cancer and to a number of other disease-specific collections. Indigenous people are not accurately identified in many of these collections, however, because of differences in the definitions used for Indigenous identification, and the failure, in many cases, to record a client’s Indigenous status.

As a result, even for something as basic as mortality information, only 57% of projected Indigenous deaths were identified in 2000-2004 [2]. The level of identification was so low for most jurisdictions that the ABS’s estimates of age-specific death rates in 2000-2004 were based only on the combined data from Qld (53% identification of projected deaths), WA (72%), SA (66%), and the NT (94%).

At 94%, the implied identification of Indigenous births was much better in 2000-2004 [3], but the level of identification in hospital admissions is very variable, with the overall level unlikely to be better than for deaths [4].

With these uncertainties, there must be some doubt about the precision of the various estimates of Indigenous health status. The differences between Indigenous and non-Indigenous people in the levels of most of these estimates are so great, however, that the slight imprecision in some estimates is of little importance.

The context of Indigenous health

Indigenous population

Based on the numbers of Aboriginal and Torres Strait Islander people counted in the 2006 Census of Housing and Population, the ABS has estimated there were 517,200 Indigenous people living in Australia at 30 June 2006 [5]. New South Wales (NSW) had the largest Indigenous population with 148,200, followed by Queensland (146,400), WA (77,900), and the NT (66,600) (Table 1). The NT had the highest proportion of Indigenous people among its population (31.6%) and Victoria the lowest (0.6%).
Table 1  Estimated Indigenous population, Australia, by jurisdiction, 30 June 2006

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Indigenous population</th>
<th>Proportion of Australian Indigenous population (%)</th>
<th>Proportion of jurisdiction population (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>148,200</td>
<td>28.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Victoria</td>
<td>30,800</td>
<td>6.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Queensland</td>
<td>146,400</td>
<td>28.3</td>
<td>3.6</td>
</tr>
<tr>
<td>Western Australia</td>
<td>77,900</td>
<td>15.1</td>
<td>3.8</td>
</tr>
<tr>
<td>South Australia</td>
<td>26,000</td>
<td>5.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Tasmania</td>
<td>16,900</td>
<td>3.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>4,000</td>
<td>0.8</td>
<td>1.2</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>66,600</td>
<td>12.9</td>
<td>31.6</td>
</tr>
<tr>
<td>Australia</td>
<td>517,200</td>
<td>100.0</td>
<td>2.5</td>
</tr>
</tbody>
</table>


Notes:  
1. The estimates of the resident Indigenous population, based on the 2006 Census counts make allowances for unknown Indigenous status and for net under-enumeration  
2. Australian population includes Jervis Bay Territory, the Cocos (Keeling) Islands, and Christmas Island

The estimated Indigenous population increased by around 58,700 (13) between 2001 and 2006, with the largest increases documented for WA (18%), the NT (17%) and Queensland (16%) [5].

The majority of Indigenous people live in cities and towns, but the Indigenous population is much more widely dispersed across Australia than is the non-Indigenous population. Slightly more than one-half of the Indigenous population lives in areas classified as ‘major cities’ or ‘inner regional’ areas, compared with almost nine-tenths of the non-Indigenous population [5]. (As well as these two classifications of ‘remoteness’ in terms of access to goods and services and opportunities for social interaction, the Australian Standard Geographical Classification (ASGC) has four other categories: ‘outer regional’, ‘remote’, ‘very remote’ and ‘migratory’ [6].) Almost one-quarter of Indigenous people live in areas classified as ‘remote’ or ‘very remote’ in relation to having ‘very little or very restricted access to goods and services and opportunities for social interaction’ [6]. Only 2% of non-Indigenous people live in remote or very remote areas.

In terms of specific geographical areas, more than one-half of all Indigenous people live in nine of the 37 Indigenous Regions (based largely on the former Aboriginal and Torres Strait Islander Commission (ATSIC) regions): Sydney; Brisbane; Coffs Harbour; Perth; Townsville, Cairns; Adelaide; Tasmania; and Wagga Wagga [5].

Of the 517,200 Indigenous people living in Australia in 2006, around 463,900 were Aboriginal, 33,100 Torres Strait Islander, and 20,200 people of both Aboriginal and Torres Strait Islander descent [5]. Most Torres Strait Islander people live in Queensland, with NSW the only other state with a large number of Torres Strait Islanders.

The Indigenous population is much younger overall than the non-Indigenous population [5]. According to the 2006 Australian census, about 37% Indigenous people were aged less than 15 years, compared with 19% of non-Indigenous people (see Figure). About 3% of Indigenous people were aged 65 years or over, compared with 13% of non-Indigenous people.
The socioeconomic context

There is an irrefutable relationship between the social inequalities experienced by Indigenous people and their current health status [7]. This social disadvantage, directly related to dispossession and characterised by poverty and powerlessness, is reflected in measures of their education, employment, and income. Thus, prior to presenting the key indicators of Indigenous health status, it is important to provide a brief summary of the context within which these indicators should be considered.

The key measures in these areas for Indigenous people nationally include:

**Education**

According to the 2006 Australian census:

- 88% of five year old Indigenous children and 95% of five year old non-Indigenous children were attending an educational institution;

- 2.5% of the Indigenous population had not attended school compared with 0.9% of the non-Indigenous population;

- one-third (32%) of Indigenous people reported year 10 as their highest year of school completion and less than one-quarter (22%) completed year 12 compared with almost one-half (47%) of non-Indigenous people;

- one-quarter (25%) of Indigenous people reported having a post school qualification, compared with almost one-half (47%) of non-Indigenous people; and

- 4.1% of non-Indigenous people reported attending a university, compared with 1.7% of Indigenous people [8].

The 2006 national report on schooling in Australia showed:

- 80% of Indigenous students in year three and 63% in year seven achieved the national reading benchmark, compared with 93% and 89% respectively of all Australian students; and

- 76% of Indigenous students in year three and 48% in year seven achieved the national numeracy benchmark, compared with 93% and 80% respectively of all Australian students [9].

**Employment**

According to the 2006 Australian census:
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- 46% of Indigenous people aged 15 years or older were employed, 8.5% were unemployed, and 46% were not in the labour force. In comparison, 62% of non-Indigenous people aged 15 years or older were employed, 3.3% were unemployed, and 35% were not in the labour force;
- excluding people employed under the Community Development Employment Project (CDEP) scheme increases the unemployment rate for Indigenous people to approximately 25% - five times the rate of 5% for non-Indigenous people;
- the most common occupation classification of employed Indigenous people was ‘labourer’ (24%). The most common occupation classification of employed non-Indigenous people was ‘professional’ (20%) [8].

Income

According to the 2006 Australian census:
- the mean equivalised gross household income for Indigenous persons was $460 per week – approximately 62% of that for non-Indigenous people ($740);
- 45% of the Indigenous population were in the lowest income quintile (mean equivalised gross household income of less than $315 per week). The non-Indigenous population was almost evenly distributed among the five income quintiles;
- the median gross individual income for Indigenous people was $278 per week compared with $473 for non-Indigenous people;
- ‘professionals’ were the highest median gross weekly income earners and ‘labourers’ were the lowest. Indigenous people earned 28% and 16% less than non-Indigenous people in these occupations [8].

Births and pregnancy outcome

In 2006, there were 12,496 births registered in Australia with one or both parents identified as Indigenous (4.7% of all births registered), but this figure probably underestimates the true number slightly as it has been estimated that only 96% of Indigenous births in 2002-2006 were correctly identified as such [10]. Completeness of identification varies across the country, with only Queensland, Victoria, WA, SA and the NT having levels above 90%.

Both parents were identified as Indigenous in 30% of these births occurring in 2006, only the mother in 41% (including births where paternity was not acknowledged and those where the father’s Indigenous status was unknown), and only the father in 29% [10].

Age of mothers

In 2006, Indigenous women tended to have more babies and to have them at younger ages than did non-Indigenous women – teenagers had more than one-fifth of the babies born to Indigenous women, compared with only 3.6% of those born to non-Indigenous mothers [10]. The median age of Indigenous mothers was 24.6 years, compared with 30.8 years for all women. The highest birth rates (known technically as fertility rates) were for the 20-24 years age group for Indigenous women and in the 30-34 years age group for non-Indigenous women (Table 2). Fertility of teenage Indigenous women (69 babies per 1,000 women) was more than four times the fertility rate for all teenage women (15 babies per 1,000).

Total fertility rates

In 2006, total fertility rates were 2,118 births per 1,000 Indigenous women and 1,814 per 1,000 for all mothers (Table 3) [10]. The highest Indigenous total fertility rate for Indigenous women was for the SA (2,539), followed by the NT (2,412 babies per 1,000) and Western Australia (2,278 babies per 1,000).

Birthweights

The average birthweight of babies born to Indigenous mothers in 2006 was 3,169 grams – more than 200 grams less than the average for babies born to non-Indigenous mothers, 3,378 grams [Derived from 11]. Babies born to Indigenous women in 2006 were twice as likely to be of low birthweight (LBW) (12.4%) than were those born to non-Indigenous women (6.2%). (LBW, defined as a birthweight of less than 2,500 grams, increases the risk of death in infancy and other health problems.) The low-birthweight proportions for babies born to Indigenous women were highest for WA (14.2%), the NT (14.2%) and SA (13.4%).
### Table 2  
**Age-specific fertility rates, by Indigenous status of mother, selected jurisdictions, Australia, 2006**

<table>
<thead>
<tr>
<th>Status of mother / age group</th>
<th>Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NSW</td>
</tr>
<tr>
<td>Indigenous</td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>59</td>
</tr>
<tr>
<td>20-24</td>
<td>114</td>
</tr>
<tr>
<td>25-29</td>
<td>106</td>
</tr>
<tr>
<td>30-34</td>
<td>73</td>
</tr>
<tr>
<td>35-39</td>
<td>37</td>
</tr>
<tr>
<td>40-44</td>
<td>8</td>
</tr>
<tr>
<td>All mothers</td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>13</td>
</tr>
<tr>
<td>20-24</td>
<td>50</td>
</tr>
<tr>
<td>25-29</td>
<td>100</td>
</tr>
<tr>
<td>30-34</td>
<td>120</td>
</tr>
<tr>
<td>35-39</td>
<td>65</td>
</tr>
<tr>
<td>40-44</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: ABS, 2007 [10]

Notes:  
1. Rates per 1,000 women in each age group  
2. Figures in this table are restricted to those jurisdictions with estimated identification of Indigenous births of around 90% or higher

### Table 3  
**Total fertility rates, by Indigenous status of mother, selected jurisdictions, Australia, 2006**

<table>
<thead>
<tr>
<th>Status of mother</th>
<th>Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NSW</td>
</tr>
<tr>
<td>Indigenous</td>
<td>1,984</td>
</tr>
<tr>
<td>All mothers</td>
<td>1,800</td>
</tr>
</tbody>
</table>

Source: ABS, 2007 [10]

Notes:  
1. Total fertility rate is the number of children born to 1,000 women at the current level and age pattern of fertility  
2. Figures in this table are restricted to those jurisdictions with estimated identification of Indigenous births of around 90% or higher
Risk factors for LBW include socioeconomic disadvantage, the size and age of the mother, the number of babies previously born, the mother’s nutritional status, illness during pregnancy and the duration of the pregnancy [12]. A mother’s alcohol consumption and use of tobacco and other drugs during pregnancy can also impact on the size of her baby.

Tobacco, in particular, has a major impact on birthweight. The mean birthweight of live babies born in 2001-2004 to Indigenous women who smoked was 3,037 grams, more than 250 grams lighter than those born to Indigenous women who did not smoke (3,290 grams) [13]. The comparable figures for live babies born to non-Indigenous women were 3,210 and 3,416 grams respectively. The impact of tobacco smoking during pregnancy was seen also in the proportions of low birthweight liveborn babies – 16% and 10% respectively for Indigenous and non-Indigenous women who smoked during pregnancy, and 10% and 5% for those who didn’t.

The 2000-2001 Western Australian Aboriginal Child Health Survey (WAACHS) reported slightly higher average birthweights – 3,100 grams for babies born to mothers who used tobacco in pregnancy and 3,310 grams for those whose mothers did not [14]. The lowest average birthweights reported in the WAACHS were for babies whose mothers used marijuana with tobacco (3,000 grams) or marijuana with both tobacco and alcohol (2,940 grams).

**Mortality**

Major impediments to producing a complete picture of Indigenous mortality in Australia are the incomplete identification of Indigenous status in death records, and the experimental nature of the population estimates [15]. As a result, the 2,279 deaths registered in 2006 where the deceased person was identified as Indigenous is certainly an underestimate of the actual number of Indigenous deaths.

Assessment by the ABS of the completeness of recording of Indigenous deaths is based on a comparison of registered Indigenous deaths with an estimate of the expected number of Indigenous deaths for the particular jurisdiction. The estimated completeness of identification of Indigenous people in death registrations has improved generally in recent years, but was still generally quite poor in 2002-2006 [15]. Australia-wide, only 55% of Indigenous deaths were identified correctly – the Northern Territory (90%) was the only jurisdiction with a reasonable proportion of Indigenous deaths identified correctly. The proportions for the other jurisdictions were: NSW (45%), Victoria (32%), Queensland (51%), WA (72%) and SA (62%). Estimate weren’t available for Tasmania and the ACT. Reflecting the various levels of under-identification of Indigenous status in death registrations, caution needs to be exercised in interpretation of the figures presented in this report. It is possible that the true figures could be up to 30% higher than those presented here.

The poor coverage, coupled with the need to update the procedures for estimating coverage based on population figures derived from the 2001 census, has meant that the recent ABS publications do not include detailed tables of Indigenous deaths, nor information about overall death rates. As a result, there is no consistency about the extent of information available for recent years. Reflecting this, readers should be aware that the following sections vary in terms of the years to which they relate.

**Standardised death rates**

After adjusting for the differences in the age structures of the Indigenous and non-Indigenous populations and for the incomplete identification of Indigenous status in death registrations, the numbers of deaths of Indigenous people in 2000-2004 were around
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four times higher than the numbers expected from the age-sex-specific death rates for the total Australian populations (Table 5) [2, 16-19]. (The ABS warns that the projected numbers of deaths should be interpreted with caution [16]. It is possible that the standardised mortality ratios (SMRs) based on the projected numbers of deaths may over-estimate the differences between Indigenous and total population mortality, but it is likely that the true ratios will be closer to these estimates than to those based solely on death registrations.)

Box 1
Comparison of overall death rates needs to adjust for differences in the age structures of the Indigenous and non-Indigenous populations in a process known as standardisation. The lack of detailed information about Indigenous deaths in terms of sex and age means that it is not possible to estimate standardised death rates, but it is possible to compare the numbers of registered and projected Indigenous deaths with the numbers expected from the corresponding age-sex-specific death rates for the total populations. This comparison produces what are called standardised mortality ratios (SMRs). The comparisons reported here are based on the 2002 age-specific death rates for the corresponding total Australian populations.

Table 5 Registered and projected Indigenous deaths and standardised mortality ratios (SMRs), by sex and jurisdiction, Australia, 2000-2004

<table>
<thead>
<tr>
<th></th>
<th>Registered deaths</th>
<th>Projected deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>SMR</td>
</tr>
<tr>
<td></td>
<td>Persons</td>
<td>Males</td>
</tr>
<tr>
<td>Australia</td>
<td>10,550</td>
<td>6,037</td>
</tr>
<tr>
<td>NSW</td>
<td>2,445</td>
<td>1,412</td>
</tr>
<tr>
<td>Vic</td>
<td>477</td>
<td>n/a</td>
</tr>
<tr>
<td>Qld</td>
<td>2,838</td>
<td>1,601</td>
</tr>
<tr>
<td>WA</td>
<td>1,861</td>
<td>1,068</td>
</tr>
<tr>
<td>SA</td>
<td>644</td>
<td>359</td>
</tr>
<tr>
<td>NT</td>
<td>2,225</td>
<td>1,285</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>5,371</td>
<td>3,102</td>
</tr>
<tr>
<td>Vic</td>
<td>1,144</td>
<td>n/a</td>
</tr>
<tr>
<td>Qld</td>
<td>5,312</td>
<td>2,997</td>
</tr>
<tr>
<td>WA</td>
<td>2,584</td>
<td>1,483</td>
</tr>
<tr>
<td>SA</td>
<td>982</td>
<td>547</td>
</tr>
<tr>
<td>NT</td>
<td>2,365</td>
<td>1,366</td>
</tr>
</tbody>
</table>

Source: Derived from ABS 2000-2005 [2, 16-21]
Note: Figures for Australia include the Australian Capital Territory, Tasmania and Other Territories (Christmas Island, Cocos (Keeling) Islands and the Jervis Bay Territory)

Expectation of life
After adjustment for the underestimate of the number of deaths identified as Indigenous, the ABS estimates that Indigenous males born in 1996-2001 could be expected to live to 59.4 years, more than 17 years less than the 76.6 years expected for all
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males in 1998-2000 (Table 6) [22]. The expectation of life at birth of 64.8 years for Indigenous females in 1996-2001 was more than 17 years less than the expectation of 82.0 years for all Australian females in 1998-2000.

Table 6  Expectation of life at birth for Indigenous people and the total population, Australia and selected States, 1996-2001

<table>
<thead>
<tr>
<th>Population</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous, 1996-2001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>59.4</td>
<td>64.8</td>
</tr>
<tr>
<td>New South Wales/ Victoria</td>
<td>60.0</td>
<td>65.1</td>
</tr>
<tr>
<td>Queensland</td>
<td>58.9</td>
<td>62.6</td>
</tr>
<tr>
<td>Western Australia/ South Australia</td>
<td>58.5</td>
<td>67.2</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>57.6</td>
<td>65.2</td>
</tr>
<tr>
<td>Total population, 1998-2000</td>
<td>76.6</td>
<td>82.0</td>
</tr>
</tbody>
</table>

Source: ABS, 2006 [22]

Note: The Australian Indigenous estimates are based on the adjusted numbers of deaths for NSW, Victoria, Queensland, WA, SA and the NT, and do not include deaths for the ACT and Tasmania.

Age at death

For those jurisdictions with reasonable information about Indigenous deaths, the median age at death in 2006 ranged from 45.4 years for Indigenous males living in the NT to 59.3 years for those living in NSW [22]. (The median age at death is the age below which 50% of people die. Because the measure partly reflects the age structures of the respective populations, it is a less precise measure than age-specific death rates, which are summarised below.) These levels are around 20 years less than those for non-Indigenous males, which were generally around 76-78 years. The median age at death for Indigenous females in 2005 ranged from 57.0 years for SA and Queensland to 64.8 years for NSW. These levels are more than 20 years less than those for non-Indigenous females, which were generally between 83 and 84 years.

In 2002-2006 the age-specific death rates were higher for Indigenous people than for non-Indigenous people across all age groups, but the rate ratios were particularly high in the young and middle adult years (Table 7) [15]. (These ratios, being based on the numbers of deaths registered, are likely to underestimate the true differences between death rates for Indigenous people and the total population by around 30%.)

Infant mortality

The infant mortality rate is the number of deaths of children under one year of age in a calendar year per 1,000 live births in the same calendar year. For those jurisdictions with reasonable information about Indigenous deaths in 2004-2006, the highest Indigenous infant mortality rate was in the NT (15.6) and the lowest in NSW (8.4) (Table 8) [15]. These rates are considerably higher than those for the total population in these jurisdictions, which range from the NT (9.5) to SA (4.0).
Table 7  Indigenous and total population age-specific death rates (registered deaths) and Indigenous:non-Indigenous rate ratios, by sex, Queensland, Western Australia, South Australia, and the Northern Territory, 2002-2006

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Indigenous</th>
<th>Non-Indigenous</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Males</td>
</tr>
<tr>
<td>0-15</td>
<td>15</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>1-4</td>
<td>71</td>
<td>63</td>
<td>27</td>
</tr>
<tr>
<td>5-14</td>
<td>30</td>
<td>23</td>
<td>12</td>
</tr>
<tr>
<td>15-24</td>
<td>194</td>
<td>101</td>
<td>73</td>
</tr>
<tr>
<td>25-34</td>
<td>422</td>
<td>193</td>
<td>102</td>
</tr>
<tr>
<td>35-44</td>
<td>836</td>
<td>448</td>
<td>137</td>
</tr>
<tr>
<td>45-54</td>
<td>1390</td>
<td>852</td>
<td>280</td>
</tr>
<tr>
<td>55-64</td>
<td>2376</td>
<td>1717</td>
<td>692</td>
</tr>
<tr>
<td>65+</td>
<td>6346</td>
<td>5211</td>
<td>4272</td>
</tr>
</tbody>
</table>


Notes:
1. Indigenous and total population rates are for Qld, WA, SA and the NT combined
2. Rates are infant deaths per 1,000 live births for the 0 years age group and deaths per 100,000 population for all other age groups.
3. Rate ratio is the Indigenous rate divided by the non-Indigenous rate

Table 8  Infant mortality rates, Indigenous and total populations and rate ratios, selected jurisdictions, 2004-2006

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Indigenous</th>
<th>Total population</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>7.5</td>
<td>4.8</td>
<td>1.6</td>
</tr>
<tr>
<td>Queensland</td>
<td>11.1</td>
<td>5.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Western Australia</td>
<td>11.9</td>
<td>4.5</td>
<td>2.6</td>
</tr>
<tr>
<td>South Australia</td>
<td>6.7</td>
<td>3.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>16.7</td>
<td>9.7</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Source: Derived from ABS, 2007 [15]

Notes:
1. Infant mortality rate is the number of infant deaths per 1,000 live births
2. The Indigenous rates are likely to be under-estimated, due to the incomplete identification of Indigenous status on births and deaths records

Causes of death

For deaths identified as Indigenous in 2000-2004, cardiovascular disease (also known as ‘diseases of the circulatory system’, which includes heart disease and stroke) was the leading cause of death for Indigenous males and females living in Queensland, WA, SA and the NT (Table 9) [23]. The number of deaths recorded for Indigenous males was 3.1 times the number expected from the age-cause-specific rates for non-Indigenous males, and number recorded for Indigenous females 2.6 times the number expected from the age-cause-specific rates for non-Indigenous females. (See Box 1 for further information about these standardised mortality ratios (SMRs). The estimates quoted here have not been adjusted for the likely under-identification of Indigenous people in death registration systems, so SMRs could be up to 30% higher) [12].

For Indigenous males, the next most frequent causes of death were injuries (including transport accidents, intentional self-harm and assault) (SMR 2.8), malignant neoplasms (cancers) (SMR 1.5), diseases of the respiratory system (SMR 4.1), and endocrine, nutritional and metabolic disorders (mainly diabetes) (SMR 7.5) [23]. For Indigenous females, the most frequent causes of death after cardiovascular disease were malignant neoplasms (SMR 1.5), endocrine, nutritional and metabolic disorders (SMR 10.6), injuries (SMR 3.3), and diseases of the respiratory system (SMR 3.7).

Maternal mortality

In Australia in 2003-2005 (the most recent period for which detailed data are available), six (10%) of the 60 maternal deaths where Indigenous status was known were of Indigenous women (Indigenous status was not reported in 8% of the deaths) [24].
Reflecting the higher rate of confinements among Indigenous women, the maternal mortality ratio for Indigenous women in 2003-2005 was 21.5 deaths per 100,000 confinements, almost three times higher than the ratio of 7.9 per 100,000 for non-Indigenous women (Table 10) [24]. For direct maternal deaths, the ratio for Indigenous women was 7.2 per 100,000 compared with 3.6 per 100,000 for non-Indigenous women.

### Table 9

Indigenous:non-Indigenous standardised mortality ratios, by cause and sex, Queensland, Western Australia, South Australia and the Northern Territory, 2000-2004

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMR</td>
<td>SMR</td>
</tr>
<tr>
<td>Circulatory</td>
<td>3.1</td>
<td>2.6</td>
</tr>
<tr>
<td>Injuries</td>
<td>2.8</td>
<td>3.3</td>
</tr>
<tr>
<td>Cancer</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Endocrine, nutritional and metabolic</td>
<td>7.5</td>
<td>10.6</td>
</tr>
<tr>
<td>Respiratory</td>
<td>4.1</td>
<td>3.7</td>
</tr>
<tr>
<td>Digestive</td>
<td>5.2</td>
<td>4.7</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>4.8</td>
<td>7.1</td>
</tr>
<tr>
<td>Nervous system</td>
<td>2.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Mental and behavioural disorders</td>
<td>6.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Infectious/parasitic</td>
<td>5.0</td>
<td>5.3</td>
</tr>
<tr>
<td>All causes</td>
<td>2.6</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Source: AIHW, 2006 [23]

Notes:

1. The standardised mortality ratio (SMR) is the ratio of the number of Indigenous deaths occurring to the number expected if the age, sex and cause-specific rates of the Australian total population applied to the Indigenous population.

2. Due to under-identification of Indigenous deaths, these numbers and SMRs are likely to underestimate the true differences between the Indigenous and non-Indigenous populations by around 30%.

### Table 10

Numbers of confinements, maternal deaths and maternal mortality ratios, by Indigenous status, Australia, 2003-2005

<table>
<thead>
<tr>
<th>Indigenous status</th>
<th>Confinements</th>
<th>Maternal deaths</th>
<th>Maternal mortality ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indigenous</td>
<td>27,901</td>
<td>6</td>
<td>21.5</td>
</tr>
<tr>
<td>Direct and indirect maternal deaths</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct maternal deaths</td>
<td>2</td>
<td>2</td>
<td>7.2</td>
</tr>
<tr>
<td>Non-Indigenous</td>
<td>745,347</td>
<td>59</td>
<td>7.9</td>
</tr>
<tr>
<td>Direct and indirect maternal deaths</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct maternal deaths</td>
<td>27</td>
<td>27</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Source: Derived from Sullivan, Hall, King, 2008 [24]

Note:

1. Maternal mortality ratio is the number of maternal deaths divided by the number of confinements (in 100,000s). Due to some uncertainty about the numbers of Indigenous deaths and confinements, some caution must be exercised in the interpretation of the ratios.

2. The non-Indigenous numbers and ratios include deaths for which Indigenous status was not known. This probably results in a slight, unknown over-estimate, and a resultant under-estimate of the differences between Indigenous and non-Indigenous women.
Overview of Australian Indigenous health status, November 2008

Hospitalisation

Statistics on hospital admissions and procedures provide some insights into ill-health in the population. They are, however, quite a poor reflection of the extent and patterns of treatable illness in the community, because they represent only illness that is serious enough to require hospitalisation and are influenced to some degree by the geographic accessibility of hospitals.

Another limitation of hospital statistics as an indicator of the health of the public is that they relate to episodes of hospitalisation rather than individual patients. Thus, multiple admissions by a relatively small number of patients—as occurs for end-stage renal disease, for example—limit the inferences that can be drawn about overall health patterns from aggregated statistics. These statistics are, of course, useful in assessing the need for health services, but of far less use in assessing health.

As is the case with other major health-related data collections (such as births and deaths), the identification of Indigenous status in the hospital data collection is incomplete, and for 2005-06 was only considered acceptable for Queensland, Western Australia, South Australia and the Northern Territory [25]. Even for those jurisdictions deemed to have acceptable data, the aggregated data under-estimate the true difference between Indigenous and non-Indigenous hospitalisation, possibly by as much as 20-25%.

Separation rates

Of the 2.86 million hospital separations for Queensland, WA, SA and the NT during 2005-06, 184,232 (6.4%) were identified as Indigenous, with 40% of separations for Indigenous patients being for overnight stays (Table 11) [25].

The overall age-standardised separation rate of 1,039 per 1,000 for the Indigenous population was 2.9 times that of the non-Indigenous population (352 per 1,000) (Table 11) [25]. The age-standardised separation rate for Indigenous people living in the NT was 1,404 per 1,000, 6.0 times that rate of 234 per 1,000 for non-Indigenous people.

Table 11 Hospitalisation: separations and age-standardised separation rates, by Indigenous status, and Indigenous:non-Indigenous rate ratios, Queensland, WA, SA and the NT, 2005-06

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Indigenous Number</th>
<th>Indigenous Rate</th>
<th>Non-Indigenous Number</th>
<th>Non-Indigenous Rate</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queensland</td>
<td>62,423</td>
<td>807</td>
<td>638,466</td>
<td>362</td>
<td>2.2</td>
</tr>
<tr>
<td>Western Australia</td>
<td>49,900</td>
<td>1,099</td>
<td>309,997</td>
<td>342</td>
<td>3.2</td>
</tr>
<tr>
<td>South Australia</td>
<td>16,349</td>
<td>924</td>
<td>216,832</td>
<td>355</td>
<td>2.6</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>55,560</td>
<td>1,548</td>
<td>27,815</td>
<td>240</td>
<td>6.5</td>
</tr>
<tr>
<td>All jurisdictions</td>
<td>184,232</td>
<td>1,039</td>
<td>1,411,481</td>
<td>352</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Source: AIHW, 2007 [25]

Notes
1. Rates per 1,000 population have been standardised using the population estimates at 30 June 2005
2. Non-Indigenous rates, but not numbers, include separations for which Indigenous status was not stated
3. Rate ratio is the Indigenous rate divided by the non-Indigenous rate
4. Numbers and rates for the NT are for public hospitals only
5. The incomplete identification of Indigenous status means that these figures under-estimate the true difference between Indigenous and non-Indigenous rates, particularly for Queensland, WA and SA

Age-specific separation rates

Separation rates were higher for Indigenous people living in Queensland, WA, SA and the NT in 2005-06 than for non-Indigenous people for virtually all age groups, with the highest differences in the middle adult years (Table 12) [25].

Causes of hospitalisation

In 2005-06 the most common reason of hospitalisation for Indigenous people living in Queensland, WA, SA and the NT was ‘care involving dialysis’ accounting for 46% of Indigenous separations (more than 84,500 separations) [25]. Many of these separations involved repeat admissions for the same people, some on an almost daily basis. The ICD group ‘Injury and other consequences of external causes’ (including motor vehicle accidents, assaults, self-inflicted harm and falls) was the next most common cause of hospitalisation for Indigenous people, being responsible for 13,819 separations (7.5% of all separations, and 13.9% of separations excluding those for dialysis) (Table 13).

Excluding separations for dialysis and pregnancy-related conditions, most of which involved normal deliveries, the next leading causes of hospitalisation for Indigenous people were for respiratory conditions (responsible for more than 11,000 separations –

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11.3% of separations excluding those for dialysis) and digestive diseases (more than 8,600 separations – 8.6% of separations excluding those for dialysis) (Table 13) [25].

Separation rates were higher for Indigenous people than for non-Indigenous people for all main ICD groups except for digestive disorders.

### Table 12  Age-specific hospital separation rates, by Indigenous status and sex, and Indigenous:non-Indigenous rate ratios, Qld, WA, SA and the NT, 2005-06

<table>
<thead>
<tr>
<th>Age group</th>
<th>Males</th>
<th></th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indigenous rate</td>
<td>Non-Indigenous rate</td>
<td>Rate ratio</td>
<td>Indigenous rate</td>
<td>Non-Indigenous rate</td>
<td>Rate ratio</td>
</tr>
<tr>
<td>0-4</td>
<td>375</td>
<td>270</td>
<td>1.4</td>
<td>175</td>
<td>203</td>
<td>1.4</td>
</tr>
<tr>
<td>5-14</td>
<td>105</td>
<td>94</td>
<td>1.1</td>
<td>331</td>
<td>75</td>
<td>1.2</td>
</tr>
<tr>
<td>15-24</td>
<td>181</td>
<td>137</td>
<td>1.3</td>
<td>529</td>
<td>239</td>
<td>1.7</td>
</tr>
<tr>
<td>25-34</td>
<td>337</td>
<td>155</td>
<td>2.2</td>
<td>688</td>
<td>388</td>
<td>1.7</td>
</tr>
<tr>
<td>35-44</td>
<td>923</td>
<td>206</td>
<td>4.5</td>
<td>1158</td>
<td>309</td>
<td>3.6</td>
</tr>
<tr>
<td>45-54</td>
<td>1679</td>
<td>308</td>
<td>5.4</td>
<td>1522</td>
<td>338</td>
<td>5.5</td>
</tr>
<tr>
<td>55-64</td>
<td>2288</td>
<td>544</td>
<td>4.2</td>
<td>1435</td>
<td>469</td>
<td>3.2</td>
</tr>
<tr>
<td>65-74</td>
<td>2494</td>
<td>903</td>
<td>2.8</td>
<td>2857</td>
<td>740</td>
<td>3.3</td>
</tr>
<tr>
<td>75+</td>
<td>1173</td>
<td>1386</td>
<td>1.1</td>
<td>1664</td>
<td>990</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Source: Derived from AIHW, 2007 [25]

Notes:
1. Rates per 1,000 population
2. Rate ratio is the Indigenous rate divided by the non-Indigenous rate
3. Rates for the NT are for public hospitals only
4. Due to the incomplete identification of Indigenous status, these figures probably under-estimate the true difference between Indigenous and non-Indigenous rates by 20-25%.

### Table 13  Hospitalisation: leading causes of Indigenous separations (excluding dialysis): numbers, proportions of separations and Indigenous:non-Indigenous ratios, Queensland, WA, SA and the NT, 2005-06

<table>
<thead>
<tr>
<th>Principal diagnosis</th>
<th>Number of separations</th>
<th>Proportion of separations (excl dialysis)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury/poisoning</td>
<td>13,186</td>
<td>13.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Pregnancy-related</td>
<td>12,521</td>
<td>12.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Respiratory diseases</td>
<td>11,216</td>
<td>11.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Digestive diseases</td>
<td>8,608</td>
<td>8.6</td>
<td>0.8</td>
</tr>
<tr>
<td>Symptoms, signs not elsewhere classified</td>
<td>6,947</td>
<td>7.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Circulatory diseases</td>
<td>5,676</td>
<td>5.7</td>
<td>2.0</td>
</tr>
<tr>
<td>Mental &amp; behavioural disorders</td>
<td>5,674</td>
<td>5.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Diseases of the skin &amp; subcutaneous tissue</td>
<td>4,468</td>
<td>4.5</td>
<td>2.8</td>
</tr>
<tr>
<td>Genitourinary diseases</td>
<td>4,305</td>
<td>4.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Infectious/parasitic diseases</td>
<td>3,921</td>
<td>3.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Endocrine (incl diabetes)</td>
<td>3,740</td>
<td>3.8</td>
<td>4.1</td>
</tr>
<tr>
<td>Other</td>
<td>19,302</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>All causes, excluding dialysis</td>
<td>99,564</td>
<td>100.0</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Source: Derived from AIHW, 2007 [25]

Notes:
1. Excludes hospitalisation for dialysis
2. Ratios are the standardised separation rates for Indigenous people divided by the standardised separation rates for non-Indigenous people
3. Due to the incomplete identification of Indigenous status, these figures probably under-estimate the true difference between Indigenous and non-Indigenous rates by 20-25%.
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Selected health conditions

Cardiovascular disease

Cardiovascular disease (CVD) presents a significant burden for Indigenous people in terms of prevalence, hospitalisation, and mortality [26]. Factors contributing to the development of cardiovascular disease include age, socio-economic circumstances, family history, physical inactivity, tobacco smoking, poor nutrition, and related physiological factors (high blood pressure, high blood cholesterol, overweight and obesity, and diabetes). A combination of risk factors and rural and remote dwelling contribute to higher levels of heart, stroke, and vascular disease among Indigenous people [26]. Immediate treatment and care of cardiovascular conditions for many Indigenous people are limited because of distance to health services, the availability of transport to access services, and language and cultural differences.

Extent of cardiovascular disease among Indigenous people

Heart and circulatory problems/diseases were reported by 12% of Indigenous people who participated in the 2004-2005 NATSIHS [27]. These problems were reported slightly more frequently by Indigenous people living in remote areas (14%) than by those living in non-remote areas (11%). The proportions represent a slight, but not statistically significant, increase from those reported to the 2001 NHS.

After adjusting for differences in the age structures of the two populations, heart and circulatory problems/diseases were around 1.3 times more common for Indigenous than for non-Indigenous people [27]. Hypertensive disease was 1.5 times more common for Indigenous than for non-Indigenous people, and other diseases of the heart and circulatory system 1.2 times.

Overall, a lower proportion of Torres Strait Islander (9%) than Aboriginal people (12%) reported having a heart and circulatory problem/disease, but the proportion was 11% for Torres Strait Islanders living in the Torres Strait area [27].

There were 5,376 hospital separations identified as Indigenous for ‘diseases of the circulatory system’ to public hospitals in Qld, WA, SA and the NT in 2004-05, representing 6% of separations identified as Indigenous (excluding those for renal dialysis) [4]. Hospitalisation rates were 1.8 times higher than for Indigenous people than for non-Indigenous people.

Details are not available for 2004-05, but Australia-wide hospitalisation rates for heart failure and coronary heart disease were between 1.5 and three times higher for Indigenous people than for non-Indigenous people in 2001-02 [26]. Indigenous males were more likely to be hospitalised for heart, stroke or vascular diseases than Indigenous females. Indigenous males were 1.3 times more likely to be hospitalised for these conditions than other Australian males, and Indigenous females were 1.7 times more likely than other Australian females. For acute rheumatic fever and chronic rheumatic heart disease, hospitalisation rates for Indigenous males and females were six and eight times higher than for other Australians.

Cardiovascular disease was the leading cause of death for Indigenous people living in Queensland, WA, SA and the NT in 2000-2004, with the numbers of deaths registered being 3.1 times the number expected from non-Indigenous rates for Indigenous males and 2.6 times for Indigenous females (Table 9) [23]. Cardiovascular disease was responsible for 27% of all of the ‘excess deaths’ experienced by Indigenous males and females (‘excess deaths’ are defined as the difference between registered and expected deaths).

Ischaemic heart disease (particularly heart attacks) was responsible for 63% of the deaths from cardiovascular disease of Indigenous males and for 50% of those of Indigenous females [28]. Cerebrovascular disease (stroke) was responsible for 15% of the deaths from cardiovascular disease of Indigenous males and for 20% of those of Indigenous females [28].

Deaths of Indigenous people from cardiovascular disease occurred at much younger ages than those of non-Indigenous people – death rates for Indigenous males were 9-10 times those of non-Indigenous males for the 25-34 years and 35-44 years age groups, and rates for Indigenous females were 12-13 times those of non-Indigenous females for the 35-44 years and 45-54 years age groups [28].

Cancer

The impact of cancer on Indigenous people often attracts much less attention than it deserves, for two main reasons. First, the level of identification of Indigenous people in cancer notifications is known to be poor, with only the data from Queensland, WA, SA, and the NT deemed adequate for publication (see below).

Second, the fact that cancer has often been reported in terms of the proportions of deaths it causes, rather than by rates, has tended to give the erroneous impression that cancer does not have a great impact among Indigenous people. Proper analyses, however, suggest that there are around 40% more cancer deaths among Indigenous Australians than expected on the basis of non-Indigenous rates [29].
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Extent of cancer among Indigenous people

The evidence available suggests that the incidence rates of cancer for Indigenous people are slightly lower than those for non-Indigenous people, but that death rates are generally higher, as reflected in the Indigenous to non-Indigenous rate ratios (Table 14) [28, 30-33].

The differences between Indigenous and non-Indigenous people in incidence rates are likely to be much less than suggested by these rate ratios, however, because of the under-identification of Indigenous people in cancer registrations [28, 34]. Adjustment for the estimated under-identification of 15% in cancer registrations in the NT suggests Indigenous to non-Indigenous incidence rate ratios of 1.0 and 1.1 respectively for males and females in that jurisdiction. The levels of under-identification in cancer registrations are not known for Queensland, WA and SA, but a special analysis of cancer incidence among Indigenous people living in SA in 1977-2001 found that the Indigenous and non-Indigenous rates for that State were similar – the rate ratio for males was estimated at 0.9 and that for females at 1.0 [35].

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Incidence rate ratio</th>
<th>Death rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Queensland</td>
<td>0.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Western Australia</td>
<td>0.6</td>
<td>0.7</td>
</tr>
<tr>
<td>South Australia</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>0.9</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Source: ABS & AIHW, 2003 [36]; ABS & AIHW, 2005 [28]; Zhao, Condon and Garling, 2004 [33]

Notes: 1 Incidence data are for 1997-2001; mortality data are for 1999-2001
2 Rate ratio is the Indigenous age-standardised rate divided by the non-Indigenous age-standardised rate
3 Caution should be exercised in the interpretation of these rate ratios because of the known levels of under-identification of Indigenous status in death registrations and the unknown levels of under-identification in cancer registrations (except for the NT where a correction factor of 15% is indicated)

The under-identification of Indigenous people in deaths registrations means that the differences between Indigenous and non-Indigenous people in cancer death rates are likely to be greater than suggested by the rate ratios listed in Table 14, particularly for Queensland and, to a lesser extent, WA and SA [28].

The patterns of cancer differ somewhat between jurisdictions, but, overall in 1997-2001, lung cancer was the most common specific cancer for Indigenous males and the second most common, after breast cancer, for Indigenous females [28]. The next most common cancers for Indigenous males were prostate cancer, colorectal cancer, cancer of an unknown primary site, and liver cancer, and for Indigenous females cervical cancer, colorectal cancer, colorectal cancer and cancer of the uterus.

Lung cancer was responsible in 1999-2003 for 32% of Indigenous male deaths from cancer and for 21% of Indigenous female deaths from cancer. Cancers of the digestive organs were responsible for 29% of Indigenous male deaths from cancer and for 19% of Indigenous female deaths from cancer [28].

The greater differences between Indigenous and non-Indigenous people in death rates than in incidence rates could reflect a higher proportion among Indigenous people than among non-Indigenous people of cancers with high case-fatality rates, a generally more advanced stage of cancer at time of diagnosis or differences in treatment outcomes by stage of cancer at diagnosis.

Indigenous people do experience ‘more than their share’ of cancers with poorer survival, including cancers of the lung, liver, pancreas, oropharynx and oesophagus [35, 37].

A detailed analysis undertaken by the SA Cancer Registry of cancer among people living in that State in 1988–1994 concluded that the higher death rates among the Indigenous population were due to the more advanced stage of the tumours at diagnosis and a lower survival for primary cancers matched by site, age at diagnosis, sex, year of diagnosis and, where possible, histological type [38].

Broadly similar conclusions were reached from an analysis of the survival of NT residents diagnosed with cancer in 1991-2000 with the notable exception that Indigenous people with lung cancer were diagnosed at an earlier stage than were non-Indigenous people [30, 31].

Similar findings were also reported from a matched cohort study of 815 Indigenous and 810 non-Indigenous people living in Queensland and diagnosed with cancer in 1997-2002 – the likelihood of death from cancer was 30% higher for Indigenous cases.
than for non-Indigenous cases after accounting for cancer stage at diagnosis, treatment, and the higher rates of co-morbidities (such as diabetes, chronic renal disease, respiratory disease and acute coronary conditions) existing among Indigenous cases [39].

Importantly, analyses of cancer and cancer services for Indigenous people in the NT have highlighted the fact that the absolute differences in survival after diagnosis with cancer are greatest for cancers with the highest survival in non-Indigenous people [31, 40]. That is, for cancers that are ‘amenable to early diagnosis, effective treatment and a high probability of cure’ [40, p.8]. As well, some of the most common cancers among Indigenous people are preventable, such as ‘through reduced tobacco consumption, increased Pap test coverage and follow-up treatment, hepatitis B immunisation, and reduced alcohol misuse’ [40, p.9] (Hepatitis B is the main risk factor for primary liver cancer.)

The review concluded that ‘the experience of Indigenous people and cancer provides evidence that the Australian health system is not operating as effectively for Indigenous people as for other Australians’ and that there was a need for ‘strengthening primary health care services, reducing barriers for access to specialist services and improving collaboration between the two’ [40, pp. 16-17].

**Diabetes**

Type 2 diabetes is a significant health problem among Indigenous people, but it is not possible to reach a single estimate of the prevalence. Mortality statistics provide an indication of the substantial impact of diabetes among Indigenous people, and despite their limitations, hospitalisation data also confirm the much greater impact of the condition among Indigenous people than non-Indigenous people.

**Extent of diabetes among Indigenous people**

Diabetes/high sugar levels were reported by 6% of Indigenous people who participated in the 2004-2005 NATSIHS [27]. These problems were reported more frequently by Indigenous people living in remote areas (9%) than by those living in non-remote areas (5%). The proportions represent a slight, but not statistically significant, increase from those reported to the 2001 NHS. Bearing in mind the fact that for every person with identified diabetes there is likely to be another person with diabetes not yet diagnosed, these estimates are similar to those made in a major review of evidence from a variety of epidemiological studies that concluded that the overall prevalence among Indigenous people was between 10% and 30% [41].

After adjusting for differences in the age structures of the two populations, diabetes/high sugar levels were around 3.4 times more common for Indigenous than for non-Indigenous people [27]. The ratio between Indigenous and non-Indigenous females (4.1) was higher than that between Indigenous and non-Indigenous males (2.9).

Overall, a lower proportion of Torres Strait Islander (5%) than Aboriginal people (6%) reported having diabetes/high sugar levels (the difference is not statistically significant), but the proportion was 11% for Torres Strait Islanders living in the Torres Strait area [27].

The prevalence of diabetes increases with age, with the increase occurring at much younger ages among Indigenous people – the prevalence reported by Indigenous people aged 35-44 years was five times that reported by non-Indigenous people (Table 15) [27].

<table>
<thead>
<tr>
<th>Table 15</th>
<th>Diabetes: proportions of people reporting diabetes/high sugar levels as a ‘long-term health condition’, by Indigenous status, and Indigenous:non-Indigenous ratios, Australia, 2004-2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group (years)</td>
<td>Indigenous people</td>
</tr>
<tr>
<td>15-24</td>
<td>1.0</td>
</tr>
<tr>
<td>25-34</td>
<td>4.3</td>
</tr>
<tr>
<td>35-44</td>
<td>10.0</td>
</tr>
<tr>
<td>45-54</td>
<td>20.7</td>
</tr>
<tr>
<td>55+</td>
<td>32.1</td>
</tr>
</tbody>
</table>

Source: Australian Bureau of Statistics, 2006 [27]  
Note: Ratio is the Indigenous proportion divided by the non-Indigenous proportion.

Few reports have been published about gestational diabetes mellitus (GDM), but information from the Northern Territory Midwives’ Collection found that around 6.3% of Indigenous women in the Territory developed GDM, compared with 4.1% of non-Indigenous women [42]. After allowance is made for the younger ages generally of the Indigenous women compared with the non-Indigenous women, the level of GDM among Indigenous women was 2.3 times that among non-Indigenous women.
Overview of Australian Indigenous health status, November 2008

As is the case with most health conditions, hospitalisation rates are not an accurate reflection of the burden of diabetes in the community. This is reflected in the fact that diabetes was recorded as the principal diagnosis in only 2% of episodes of hospitalisation for both Indigenous males and females in 2003-04 [43]. Of these episodes, 17% were for type 1 diabetes. (Of course, diabetes also contributed to many other episodes of hospitalisation, for which it wasn't recorded as the principal diagnosis.)

Despite this limitation of the data, the higher levels of diabetes among Indigenous than among non-Indigenous people are reflected in hospitalisation figures. Australia-wide in 2003-04, age-adjusted hospitalisation rates of Indigenous males and females for type 2 diabetes as the principal diagnosis were eight and ten times higher than those of non-Indigenous males and females [43]. As well as admissions for diabetes as a principal diagnosis, the condition was also reported frequently as an additional diagnosis in admissions for care involving dialysis, cardiovascular disease (including ischaemic heart disease and stroke), respiratory disease, and for bacterial diseases.

Diabetes is a major contributor to Indigenous mortality, being responsible for more than 8% of deaths of Indigenous people living in Qld, WA, SA and the NT in 1999-2003 [28]. The numbers of deaths from ‘endocrine, nutritional and metabolic diseases’ (almost 90% of which were due to diabetes) were 7.5 times higher for Indigenous males than the number expected from rates for non-Indigenous males and 10.5 times higher than expected for Indigenous females. Among people aged 35-54 years, the death rate of Indigenous males was 23 times the rate of non-Indigenous males and the rate of Indigenous females 37 times that of non-Indigenous females.

Mental health

Despite the importance of mental health to the total wellbeing of the whole Indigenous community [44], ‘there are glaring deficiencies in our knowledge’ about mental health disorders [45, p. 150]. The deficiencies in knowledge are complicated by the complexity of the general area of mental health, in which ‘diverse views exist and where terms are used in different ways’ [46, p.5].

In trying to clarify the terms used, The National Mental Health Plan, 2003-2008 defines mental health as ‘a state of emotional and social wellbeing in which the individual can cope with the normal stresses of life and achieve his or her potential’ [46, p.5]. (The Plan notes that the term ‘social and emotional wellbeing’ is preferred by some people, including Indigenous people, because of its more positive and holistic connotations.)

The Plan recognises a continuum between mental health (or social and emotional wellbeing) and mental illness – ‘a clinically diagnosable disorder that significantly interferes with an individual’s cognitive, emotional and social abilities’ [46, p.5]. Using this terminology, mental illness includes potentially life-threatening conditions like chronic depression and schizophrenia, for which a person needs professional help, often from a psychiatrist. The Plan uses the term ‘mental health problems’ for those issues that interfere with a person’s cognitive, emotional and social abilities to a lesser extent than a clinical mental illness. Trauma and grief – related to ‘the history of invasion, the ongoing impact of colonisation, loss of land and culture, high rates of premature mortality, high levels of incarceration, high levels of family separations … and also Aboriginal deaths in custody’ – have been identified as underlying the great burden among Indigenous people of ‘mental health problems’, which may lead to ‘mental illness’ [44, 46].

The distinction between ‘mental illness’ and ‘mental health problems’ is not well defined [46], but it is an important distinction in ensuring that all aspects of the lack of mental health (or social and emotional wellbeing) are addressed adequately in Indigenous, and other, populations.

The combination of the Plan with the Social and emotional well being framework: a national strategic framework for Aboriginal and Torres Strait Islander peoples’ mental health and social and emotional well being, 2004-2009 [47], provide the foundation for greater coordination of Indigenous-specific initiatives with relevant general developments in the mental health area, and thus enhance the prospects of much more rapid progress than has been achieved to date. Importantly, the policy statements include appropriate monitoring mechanisms involving the high-level committees responsible nationally for monitoring overall progress on the Indigenous health and for mental health.

Extent of mental illness and mental health problems among Indigenous people

The extent of mental illness and mental health problems has been recognised as ‘a major difficulty for most [Indigenous] communities’ [44], but, as noted above, the precise details are poorly documented.

Data on the incidence or prevalence of mental illness and mental health problems among Indigenous people are not available [12], and the Indigenous supplement of the 2001 NHS did not include specific questions related to mental health [48].

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3 The module of mental health questions used in the general NHS, the Kessler Psychological Distress Scale 10 (K-10), was omitted from the Indigenous supplement as it was not considered culturally appropriate.
Overview of Australian Indigenous health status, November 2008

The 2002 NATSISS didn’t include questions relating specifically to mental health, but did direct attention to stressors experienced in the previous 12 months. Overall, Indigenous people aged 18 years or older were almost one-and-a-half times more likely to report experiencing at least one stressor (82%) than non-Indigenous people did (57%, as reported in the 2002 ABS General Social Survey) [49]. The stressors reported most frequently by Indigenous people were: death of a family member or close friend (46%); serious illness or disability (31%); and inability to get a job (27%) (Table 16). Indigenous people living in remote areas were slightly more likely than those living in non-remote areas to report experiencing a stressor (86% compared with 81%). There were also differences between remote and non-remote areas in the proportions of people reporting the various types of stressors.

There were 5,642 hospital separations with a principal diagnosis of ‘mental and behavioural disorders’ identified as Indigenous in Australia in 2004–05 (5.9% of separations identified as Indigenous, excluding those for renal dialysis) [4]. The rate for Indigenous people was 1.7 times that for non-Indigenous people.

Information about hospitalisation for the specific sub-categories within this ICD chapter is not available for 2004–05, but the separation rates of Indigenous people for ‘mental and behavioural disorders due to psychoactive substance use’ in 2003–04 were 4.4 times higher for males and 3.3 times higher for females than those for their non-Indigenous counterparts [28]. Rates for Indigenous males and females for ‘schizophrenia, schizotypal and delusional disorders’ were more than double those for non-Indigenous males and females, and those for ‘mood and neurotic disorders’ and ‘organic mental disorders’ slightly higher.

### Table 16 Proportions (%) of Indigenous people reporting stressors in the previous 12 months, by region of residence and stressor type, Australia, 2002

<table>
<thead>
<tr>
<th>Type of stressor</th>
<th>Residence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Australia</td>
</tr>
<tr>
<td>Death of a family member or friend</td>
<td>46</td>
</tr>
<tr>
<td>Serious illness or disability</td>
<td>31</td>
</tr>
<tr>
<td>Not able to get a job</td>
<td>27</td>
</tr>
<tr>
<td>Alcohol or drug related problem</td>
<td>25</td>
</tr>
<tr>
<td>Overcrowding at home</td>
<td>21</td>
</tr>
<tr>
<td>Member of family sent to jail/in jail</td>
<td>20</td>
</tr>
<tr>
<td>Trouble with police</td>
<td>18</td>
</tr>
<tr>
<td>Discrimination/racism</td>
<td>18</td>
</tr>
<tr>
<td>Any stressor</td>
<td>82</td>
</tr>
</tbody>
</table>

Source: ABS, 2004 [49]

In 1999–2003, 174 Indigenous people living in Queensland, WA, SA, and the NT died as a result of ‘mental and behavioural disorders’: 5.5 times as many deaths as expected for Indigenous males and 2.2 times as many deaths as expected for Indigenous females (based on total Australian rates) [28]. A further 347 deaths of Indigenous people were attributed to ‘intentional self-harm’ (suicide).

The overall numbers of suicide conceal, however, the very high rates of suicide among young Indigenous people. From the more detailed data available for WA, SA, and the NT in 1997–2001, the Indigenous:non-Indigenous rate ratios were 3.4 for males and 6.1 for females in the 15–24 age groups (see Table 17) [50]. The exceptionally high rate for Indigenous females aged less than 24 years – higher even than for non-Indigenous males in that age group – reflects the fact that 20 of the 32 Indigenous female suicides involved females in that age group (four were of females less than 15 years old).

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4 The ICD chapter ‘Mental and behavioural disorders’, used for the classification of both hospitalisation and mortality, is very broad. As well as mental illness and mental health problems, it includes mental retardation and a broad sub-category for disorders relating to the use of psychoactive substances (including alcohol, tobacco, other drugs and volatile substances). The chapter doesn’t include, however, the results of intentional self-harm, which are classified within the ICD chapter ‘External causes of morbidity and mortality’.
Research in Queensland, NSW and the ACT has highlighted the increasing impact of suicide among young Indigenous people [51, 52]. It may be, as Tatz argues, that suicide and attempted suicide among Indigenous youth (at least in NSW and the ACT) is not the result of mental illness ‘in the strict pathological sense’ [52, p.80], but it is certainly a manifestation of mental health problems.

Unfortunately, there is little recent information available about the extent of mental illness among Indigenous people, apart from that about some aspects of hospitalisation. There is, on the other hand, a considerable number of detailed studies – the most recent from the 1980s – which support the conclusion that ‘serious psychiatric disorders occur in Indigenous populations, and are at least as common as in the mainstream population’ [45, p.140].

Renal disease

Renal disease, particularly kidney disease, is more prevalent among Indigenous people than among non-Indigenous people [28], but the high rates of end-stage renal disease (ESRD) among Indigenous people have only been fully recognised in recent years.

Extent of renal disease among Indigenous people

Data from the Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) reveal that a total of 782 Indigenous people were newly identified with ESRD between 2003 and 2006 – the age-standardised notification rate of 782 per 1,000,000 population for Indigenous people was more almost nine times the rate of 97 per 1,000,000 for non-Indigenous people (Table 18) [53]. The highest rates were for Indigenous people living in the NT (2,431 per 1,000,000), WA (1,097), SA (927) and Qld (890).

Almost three-fifths (57%) of Indigenous people newly registered with the ANZDATA between 2003-2006 were aged less than 55 years compared with less than one-third (31%) of non-Indigenous people registered (Table 19) [53].

Apart from the age group 0-14 years, age-specific notification rates were higher for Indigenous people across all ages compared with non-Indigenous people. Rate ratios were particularly high for people aged 35-44 years (9.6), 45-54 years (15.5) and 55-64 years (14.5).

The most common reason for hospitalisation for Indigenous people living in Qld, WA, SA and the NT in 2005-06 was the diagnosis of ‘care involving dialysis’, with the admission rate more than 12 times that of non-Indigenous people [54].

For the period 1999-2003, death rates from chronic kidney disease (CKD) were up to 10 times higher for Indigenous people than for non-Indigenous people [28]. Death rates were especially high after the age of 25 years for both Indigenous males and females compared with non-Indigenous people. The greatest differences occurred in the 25-34 and 45-54 age groups with Indigenous males recording 38 and 31 times the rates for non-Indigenous males and Indigenous females 57 and 48 times the rates for non-Indigenous females in the same age groups [28]. These figures potentially underestimate the contribution of CKD to death rates as deaths involving CKD can occur in the context of other chronic conditions [55]. For example, deaths from diabetes, where renal failure was reported as an associated cause of death among Indigenous people, occurred at almost twice the rate for Indigenous males and females than for their non-Indigenous counterparts [28].
### Table 18  End-stage renal disease: age-standardised notification rates, by Indigenous status, and rate ratios, selected jurisdictions, Australia, 2003-2006

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Indigenous</th>
<th>Non-Indigenous</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate</td>
<td>Number</td>
</tr>
<tr>
<td>New South Wales</td>
<td>73</td>
<td>284</td>
<td>2,575</td>
</tr>
<tr>
<td>Victoria</td>
<td>28</td>
<td>520</td>
<td>1,962</td>
</tr>
<tr>
<td>Queensland</td>
<td>208</td>
<td>890</td>
<td>1,557</td>
</tr>
<tr>
<td>Western Australia</td>
<td>158</td>
<td>1,097</td>
<td>710</td>
</tr>
<tr>
<td>South Australia</td>
<td>52</td>
<td>927</td>
<td>613</td>
</tr>
<tr>
<td>Tasmania</td>
<td>3</td>
<td>107</td>
<td>150</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>4</td>
<td>941</td>
<td>179</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>256</td>
<td>2,431</td>
<td>31</td>
</tr>
<tr>
<td>Australia</td>
<td>782</td>
<td>837</td>
<td>7,777</td>
</tr>
</tbody>
</table>

Source: Derived from McDonald, Chang & Excell, 2007 [53] and ABS low series population projections

**Notes**
1. Rates per 1,000,000 population have been standardised using the Australian population at 31 December 2004 as the reference
2. Rate ratio is the Indigenous rate divided by the non-Indigenous rate
3. Figures for Tasmania and the ACT should be interpreted with caution because of the small numbers of notifications

### Table 19  End-stage renal disease: age-specific notification rates, by Indigenous status, and rate ratios, Australia, 2003-2006

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Indigenous</th>
<th>Non-Indigenous</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate</td>
<td>Number</td>
</tr>
<tr>
<td>0-14</td>
<td>4</td>
<td>5</td>
<td>89</td>
</tr>
<tr>
<td>15-24</td>
<td>12</td>
<td>31</td>
<td>185</td>
</tr>
<tr>
<td>25-34</td>
<td>48</td>
<td>164</td>
<td>393</td>
</tr>
<tr>
<td>35-44</td>
<td>140</td>
<td>573</td>
<td>705</td>
</tr>
<tr>
<td>45-54</td>
<td>244</td>
<td>1504</td>
<td>1059</td>
</tr>
<tr>
<td>55-64</td>
<td>226</td>
<td>2659</td>
<td>1557</td>
</tr>
<tr>
<td>65-74</td>
<td>89</td>
<td>2333</td>
<td>2059</td>
</tr>
<tr>
<td>75+</td>
<td>19</td>
<td>1196</td>
<td>1730</td>
</tr>
<tr>
<td>All ages</td>
<td>782</td>
<td>7777</td>
<td></td>
</tr>
</tbody>
</table>

Source: Derived from McDonald, Chang & Excell, 2007 [53] and ABS low series population projections

**Notes**
1. Rates per 1,000,000 population
2. Rate ratio is the Indigenous rate divided by the non-Indigenous rate

### Injury
Injury from a variety of sources presents a significant burden of ill-health among Indigenous people. Assessing the total impact of injury is difficult, however. The vast majority of injuries do not result in hospitalisation or death and there are few systematic data on them other than those collected as part of population surveys, such as the ABS National Health Surveys. As a result, they may not be brought to the attention of health policy-makers and program managers [50, 56, 57].

Even for injuries that are serious enough to be recorded in the routine data collections or are identified by specific studies, there are some issues with their classification. The classification of injury has generally followed the World Health Organization’s International Classification of Diseases (ICD), which includes particular attention to the external cause and intention of the injury. This system is followed in this section, but it has its limitations (for more details, see [58]).
Understanding of the proximal factors contributing to most types of injury among Indigenous people is limited, but the levels and types of injury need to be seen within a broad context including: disruption to cultural, environmental, and lifestyle variables; socioeconomic disadvantage; geographical isolation; increased road usage; exposure to hazardous environment(s); substance abuse; violence; social and familial dysfunction; risky behaviour; risky home environments; and limited access to health and social support services [56, 57, 59-61].

**Extent of injury among Indigenous people**

Data from the 2004-2005 NATSIHS indicate that self-reported health conditions ‘as a result of an injury or accident’ were reported more frequently by Indigenous people than by non-Indigenous people across all age groups [27]. Reporting of injury increased substantially in Indigenous adults over the age of 25 years, and was highest in the 34-44 and 45-55 years age groups. Reporting of injury increased significantly in Indigenous adults over the age of 25 years, and peaked among Indigenous adults between the ages of 35-54 years. Within this age range, 24% of Indigenous and around 16% of non-Indigenous people reported a health condition as a result of an injury or accident.

Overall, the reporting of a long-term condition as a result of an injury or accident was 1.4 times higher for Indigenous people than for non-Indigenous people, with the ratio for males (1.5) being slightly higher than that for females (1.3).

One-quarter of Indigenous people reported in the 2002 NATSISS that they had been a victim of physical or threatened violence in the previous 12 months, a level nearly double that reported in the 1994 NATSIS (13%) [49]. After taking account of the different age structures of the two populations, the level of victimisation among Indigenous people was more than twice the level among non-Indigenous people [62]. Victimisation was mainly among younger Indigenous people, with males aged 15-24 years having the highest reported level (36%).

In 2004-05, injuries were responsible for almost 13,200 hospital separations for Indigenous people living in Queensland, WA, SA and the NT – almost 8% of all Indigenous separations (excluding those for renal dialysis) [63]. The separation rate of 51 per 1,000 for Indigenous people was more than twice that of 23 per 1,000 for non-Indigenous people. Assault was the most frequent external cause of the hospitalisation of Indigenous people for injury Australia-wide in 2003-04, being responsible for 20% of Indigenous male admissions for injury and for 28% of Indigenous female admissions [28]. The next most common external causes of injury hospitalisation were accidental falls (males 18%, females 16%) and transport-related injury (males 11%, females 7%). The numbers of admissions of Indigenous people for assault were very much higher than the numbers expected from non-Indigenous rates – 7 times higher for males and 31 times higher for females.

Injury was the underlying cause of death for 16% of all Indigenous deaths registered in Australia in 2004, compared with 6% of non-Indigenous deaths [28]. The number of deaths of Indigenous males from external causes of injury was 2.7 times the number expected from the rates for non-Indigenous males, and the number for Indigenous females 3.2 times the number expected from the rates for non-Indigenous females.

Death rates from injury for Indigenous males and females were higher than those for their non-Indigenous counterparts in every age group [28]. An indication of the enormous impact of injury on Indigenous females is the fact that their age-specific rates were higher generally than those for non-Indigenous males.

Intentional self-harm was responsible for 36% of the deaths from injury of Indigenous males living in Qld, WA, SA and the NT in 1999-2003, transport accidents for 26% and assault for 18% (Table 20) [28]. Transport accidents were responsible for 34% of the deaths of Indigenous females from injury, assault for 9% and intentional self-harm for 21%. The numbers of Indigenous deaths were much higher than expected from non-Indigenous rates – for all injury categories and for both sexes (see SMRs in Table 20).

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5 It is possible that some of this increase may reflect under-reporting by respondents to the 1994 NATSIS
Overview of Australian Indigenous health status, November 2008

Table 20  Injury: numbers of Indigenous deaths and SMRs, by sex, Qld, WA, SA and the NT, 2001-2003

<table>
<thead>
<tr>
<th>Injury type</th>
<th>Males</th>
<th></th>
<th>Females</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>SMR</td>
<td>Number</td>
<td>SMR</td>
</tr>
<tr>
<td>Registered deaths</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land transport accidents (V01-V89)</td>
<td>130</td>
<td>2.7</td>
<td>70</td>
<td>4.4</td>
</tr>
<tr>
<td>Intentional self-harm (X60-X84)</td>
<td>180</td>
<td>3.0</td>
<td>44</td>
<td>2.6</td>
</tr>
<tr>
<td>Assault (X85-Y09)</td>
<td>37</td>
<td>6.3</td>
<td>18</td>
<td>3.0</td>
</tr>
<tr>
<td>Other external causes</td>
<td>130</td>
<td>2.7</td>
<td>51</td>
<td>2.8</td>
</tr>
<tr>
<td>All types of injury</td>
<td>498</td>
<td>3.1</td>
<td>206</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Source: Derived from [64]

Notes
1. SMRs (standardised mortality ratios) have been calculated by dividing the numbers of Indigenous deaths for each sex by the numbers expected from the rates for non-Indigenous people of the same sex.
2. Numbers are SMRs for assault are for Qld, WA and SA only, as data for the NT are incomplete.

Respiratory disease

Respiratory diseases represent a significant burden of ill-health and hospitalisation among Indigenous people, particularly among very young and older people [65]. The development of respiratory diseases is dependent on a number of contributing factors, including poor environmental conditions, socioeconomic disadvantage, risky behaviour (particularly cigarette smoking), and previous medical conditions [66-69]. Infants and children under 5 years of age are more susceptible to developing respiratory conditions due to factors like low levels of hand and face washing, and of childhood immunisation, parental smoking, poor nutrition (including aspects related to infant-feeding and weaning practices), and poor environmental conditions [66]. Among Indigenous adults, common risk factors for respiratory diseases include tobacco smoking, use of alcohol and other substances, diabetes mellitus and chronic renal disease [68]. Factors that may affect the risk of acquiring asthma include environmental and other related factors (for example diet and lifestyle), which may also change the course of the disease, or trigger attacks of airway narrowing and symptoms [12]. Factors that can trigger airway narrowing and symptoms in people with asthma include exercise, viral infections, irritants (for example, smoking and air pollutants), specific allergens and some food preservatives.

Extent of respiratory disease among Indigenous people

Disease of the respiratory system was reported by 27% of Indigenous people who participated in the 2004-2005 NATSIHS [27]. These problems were reported more frequently by Indigenous people living in non-remote areas (30%) than by those living in remote areas (17%). The proportions represent a slight decrease from those reported to the 2001 NHS.

With 15% of Indigenous people reporting having asthma, it was the most commonly reported respiratory condition among Indigenous people, and the second most commonly reported health condition [27]. Asthma was reported more frequently by Indigenous people living in non-remote areas (17%) than by those living in remote areas (9%).

After adjusting for differences in the age structures of the two populations, the overall levels of respiratory disease were similar for Indigenous and non-Indigenous people, but the level of asthma among Indigenous people was 1.6 times that among non-Indigenous people [27].

The lower overall proportion of Torres Strait Islander (13%) than Aboriginal people (15%) reporting asthma was largely due to the low level reported by Torres Strait Islanders living in the Torres Strait area (5%) [27].

There were 10,959 hospital separations identified as Indigenous for respiratory disease for people living in Queensland, WA, SA and the NT in 2004-05, representing 11.5% of separations identified as Indigenous (excluding those for renal dialysis) [4]. Hospitalisation rates for Indigenous people were 3.3 times higher than those for non-Indigenous people (based on the under-identification of Indigenous people in the hospital inpatient collections, these ratios could be up to 25% higher). The more detailed information available for 1999-2000 revealed that separation rates were particularly high in infancy and early childhood [70].

Disease of the respiratory system is among the leading causes of death for Indigenous people, being responsible for almost 9% of all deaths of Indigenous people living in Queensland, WA, SA and the NT in 2000-2004 [23]. The numbers of deaths from respiratory disease among Indigenous people is around four times higher than the numbers expected from rates for the non-Indigenous population (Table 9). (Bearing in mind the under-identification of Indigenous people in death registration systems,
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this difference could be up to 30% higher.) Overall, respiratory disease is responsible for around 10% of the excess deaths experienced by Indigenous people [28]. The more detailed information available for Indigenous people living in WA, SA and the NT combined in 1999-2001 reveals that the leading specific respiratory cause of death for both Indigenous males and females was chronic lower respiratory disease, for which there were around five times more deaths than expected [68]. Pneumonia and influenza were responsible for only small numbers of deaths, but the numbers were 12–15 times more than expected from the rates for the non-Indigenous population.

The differences between Indigenous and non-Indigenous people in death rates from respiratory disease were particularly high among young adults, with rates in the 35-44 years age group being around 18 times higher for males and 14 times higher for females [28].

Communicable diseases

Communicable diseases of particular importance to Indigenous people include: tuberculosis; hepatitis (A, B, and C); sexually transmitted infections; HIV/AIDS; Haemophilus influenzae type b (Hib); pneumococcal disease, and meningococcal disease [71, 72].

Risk factors for communicable diseases vary according to type of disease. Communicable diseases can be caused by: bacteria (for example, pertussis (whooping cough) and tuberculosis); bacterial toxins (for example, some forms of food poisoning); viruses (for example, measles, influenza and HIV); fungi (for example, tinea); protozoan parasites (for example, malaria) [12]. Communicable diseases also include infestation with larger parasites, such as head lice, as well as diseases which are spread through infectious particles, such as transmissible spongiform encephalopathies.

Information regarding specific communicable diseases comes from a variety of sources, including individual studies and State and Territory based notifiable disease collections. Data from State collections are collected and published by the National Notifiable Disease Surveillance System (NNDSS), but Indigenous status is often not reported for large proportions of notifications.

Tuberculosis

Tuberculosis is primarily a lung infection caused by the bacterium Mycobacterium tuberculosis, which penetrates the lung tissue, causing inflammation and the development of encapsulated bacterial cells (tubercles) [73]. The main risk factors for tuberculosis are poverty, overcrowding, and malnutrition [74, 75], all common among many Indigenous communities. Other risk factors, also common among Indigenous people, are diabetes mellitus, smoking, alcohol abuse, and advanced renal disease. A recently emerged risk factor for tuberculosis is HIV [76].

Extent of tuberculosis among Indigenous people

Of the 885 notifications of tuberculosis among Australian-born people in Australia in 2002-2006, 174 (20%) were identified as being Indigenous [derived from 77, 78-81]. Almost one-half of the new cases among Indigenous people were reported by the Northern Territory (83 cases) and around one-quarter by Queensland (45 cases) (Table 21). The Australia-wide crude incidence rate of 7.2 cases per 100,000 population for Indigenous people was almost 10 times the rate of 0.7 per 100,000 for non-Indigenous people. The crude incidence rate was highest for the NT (28 cases per 100,000 population).

This comparison underestimates the true difference between Indigenous and non-Indigenous people because of differences in the age structures of the Indigenous and non-Indigenous populations - after adjusting for these differences, the incidence rate for Indigenous people was 14 times that of non-Indigenous people (Table 22). The incidence of TB is higher for Indigenous people than for non-Indigenous people across all age groups, with rate ratios being highest for the 45-54 years and 55-64 years age groups.
Table 21  Tuberculosis: numbers of new cases and crude incidence rates, Indigenous people, by jurisdiction, Australia, 2002-2006

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Number</th>
<th>Population</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>22</td>
<td>141,533</td>
<td>3.1</td>
</tr>
<tr>
<td>Vic</td>
<td>4</td>
<td>29,683</td>
<td>2.7</td>
</tr>
<tr>
<td>Qld</td>
<td>45</td>
<td>134,013</td>
<td>6.7</td>
</tr>
<tr>
<td>WA</td>
<td>11</td>
<td>69,665</td>
<td>3.2</td>
</tr>
<tr>
<td>SA</td>
<td>7</td>
<td>27,060</td>
<td>5.2</td>
</tr>
<tr>
<td>Tas</td>
<td>2</td>
<td>18,317</td>
<td>2.2</td>
</tr>
<tr>
<td>ACT</td>
<td>0</td>
<td>4,204</td>
<td>-</td>
</tr>
<tr>
<td>NT</td>
<td>83</td>
<td>59,508</td>
<td>27.9</td>
</tr>
<tr>
<td>Australia</td>
<td>174</td>
<td>483,992</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Sources: Derived from [78, 82-85]

Notes: 1 Population figures are for 30 June 2004 (the mid-point of the five-year period, 2002-2006)
2 Rates are crude incidence rates per 100,000 population

Table 22  Tuberculosis: numbers of new cases and age-specific incidence rates, by Indigenous status, and rate ratios, Australia, 2002-2006

<table>
<thead>
<tr>
<th>Age group</th>
<th>Indigenous</th>
<th>Non-Indigenous</th>
<th>Rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Rate</td>
<td>Number</td>
</tr>
<tr>
<td>0-4</td>
<td>10</td>
<td>3.3</td>
<td>47</td>
</tr>
<tr>
<td>5-14</td>
<td>10</td>
<td>1.6</td>
<td>44</td>
</tr>
<tr>
<td>15-24</td>
<td>21</td>
<td>4.4</td>
<td>43</td>
</tr>
<tr>
<td>25-34</td>
<td>32</td>
<td>8.8</td>
<td>74</td>
</tr>
<tr>
<td>35-44</td>
<td>28</td>
<td>9.3</td>
<td>60</td>
</tr>
<tr>
<td>45-54</td>
<td>31</td>
<td>15.6</td>
<td>70</td>
</tr>
<tr>
<td>55-64</td>
<td>22</td>
<td>21.2</td>
<td>71</td>
</tr>
<tr>
<td>65+</td>
<td>20</td>
<td>29.8</td>
<td>301</td>
</tr>
<tr>
<td>All ages</td>
<td>174</td>
<td>711</td>
<td></td>
</tr>
</tbody>
</table>

Source: Derived from [78, 82-85]

Notes: 1 Rates are per 100,000 population
2 Any discrepancy between the figures shown for ‘all ages’ and the sum of the number for the specific age groups is due to age not being stated in the notification
3 Rate ratio is the Indigenous rate divided by the non-Indigenous rate
4 The rate ratio for ‘All ages’ is the standardised incidence ratio, which is the number of Indigenous cases reported divided by the number expected if the Indigenous population had the same age-specific rates as the non-Indigenous population

Hepatitis

Hepatitis, an inflammation of the liver, can be caused by viral infections, alcohol or drug abuse, or an attack by the body’s immune system on itself. The viruses identified most frequently have been designated hepatitis A, B, and C (hepatitis types D through G have been identified also).
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**Hepatitis A**

Of the 314 notifications of hepatitis A for people living in WA, SA, and the NT in 2004-2006, 105 (33%) were identified as being Indigenous (Indigenous status was not stated in 1% of cases) [Derived from 86, 87, 88]. The crude notification rate of 22 per 100,000 for Indigenous people was 11.5 times the rate of 1.9 per 100,000 for non-Indigenous people. The real incidence of hepatitis A among Indigenous people is probably much higher than these figures suggest, however, as the disease is endemic in many rural and remote communities [89].

A detailed study of clinically significant HAV infection found that the disease was much more common among Indigenous children than non-Indigenous children, particularly those living in the Northern Territory, Western Australia, South Australia and north Queensland [90]. Children aged 0-4 years are at greatest risk from HAV infection.

**Hepatitis B**

Of the 157 notifications of hepatitis B for people living in WA, SA, and the NT in 2004-2006, 30 (19%) were identified as being Indigenous (Indigenous status was not stated in 23% of cases) [Derived from 86, 87, 88]. The crude notification rate of 6.3 per 100,000 for Indigenous people was 5.5 times the rate of 1.1 per 100,000 for non-Indigenous people.

Transmission of HBV occurs due to contact with blood and other body fluids (semen, vaginal fluids, and saliva) from an infected individual, commonly through sexual contact or use of contaminated injecting equipment [91]. A mother may also transmit HBV to the foetus during pregnancy. Only one-third of people acutely infected with HBV will experience obvious symptoms, including jaundice, loss of appetite and mild flu-like symptoms, but the virus can cause a more prolonged illness in which a person may look and feel well, but slowly develop severe liver damage. The risk of developing cancer of the liver is also increased in people with chronic HBV infection.

A universal vaccination program started in the Indigenous community in 1988 has had considerable success [92], but some studies suggest that Indigenous children had a sub-optimal response to the HBV vaccine more often than their non-Indigenous counterparts [93]. Possible explanations for the inefficiency of the vaccine include a failure in the cold-chain, genetic differences (specifically in the major histocompatibility complex, or MHC), or extrinsic environmental factors, such as heavy smoking among pregnant women. HBV vaccination programs are nevertheless cost-effective and relatively successful and help reduce the levels of hepatitis B infection in the Indigenous community.

**Hepatitis C**

Of the 6012 notifications of hepatitis C for people living in WA, SA, and the NT in 2004-2006, 658 (11%) were identified as being Indigenous (Indigenous status was not stated in 23% of notifications, Indigenous status was not stated) [Derived from 86, 87, 88]. The crude notification rate of 138 per 100,000 for Indigenous people was 5.5 times the rate of 38 per 100,000 for non-Indigenous people.

Transmission of hepatitis C virus (HCV) typically occurs via blood-to-blood contact [94]. Injecting drug use (IDU) is the most common method of contracting the virus and is responsible for the vast majority of cases.

Many people who are infected with HCV do not have symptoms with the virus frequently being detected through a blood test for some reason [94]. Persistence of HCV in the body, which occurs in about 80% of cases, can cause cirrhosis (permanent scarring of the liver). Chronic HCV infection is generally asymptomatic until cirrhosis has developed.

There is no vaccine or cure for HCV, but some people with HCV benefit from treatment with interferon alpha or a combination of interferon alpha and ribavirin [94].

**Haemophilus influenzae type b**

*Haemophilus influenzae* type b (Hib) is a bacterium that can cause meningitis, epiglottitis, pneumonia, septicaemia, cellulitis, osteomyelitis, pericarditis and septic arthritis [95]. Babies and children are particularly susceptible to Hib, which is spread by respiratory secretions. The main risk factors for Hib include contact with other children, particularly in large families or day care centres [96].

**Extent of Hib disease among Indigenous people**

Hib notifications in Australia declined steeply following the commencement of nationally-funded infant vaccination in 1993, but the disease persists at much lower levels [97]. Hib notifications in Australia declined from 533 cases reported in 1991 to 15 cases in 2004, and there were no deaths [97]. However, of 47 notifications of invasive Hib in 2000-2002 in jurisdictions with adequate data, 24 were for children 0-4 years and, of these, 11 (46%) were Indigenous children [98]. Among children aged 0-4 years, the annual notification rate for Indigenous children was 10 per 100,000 compared with 0.7 per 100,000 for other children. (These rates represent a reduction of almost 98% since vaccination was introduced.)

**Pneumococcal disease**

Pneumococcal disease, which is caused by the bacterium *Streptococcus pneumoniae* (pneumococcus), includes upper respiratory tract infection and lower respiratory tract infection (primarily pneumonia) [72, 98]. Invasive pneumococcal disease (IPD) occurs

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when the bacterium infects normally sterile sites, such as blood and cerebrospinal fluid, causing life-threatening septicaemia and meningitis. Recognised risk factors for pneumococcal disease include chronic illness (including chronic respiratory, cardiac and renal diseases) and immuno-compromised conditions. Children aged less than five years are particularly susceptible to pneumococcal disease.

Vaccination for IPD was funded from 2001 for Indigenous children 0-2 years (except in central Australia and adjacent areas where the conjugate pneumococcal vaccine program extends to five years of age) [98]. From 2005, vaccination was funded for all Australian infants. Vaccination with the polysaccharide vaccine has been funded since 1999 for Indigenous adults with risk factors for IPD (all Indigenous adults aged 15 years or over are eligible in the NT), and for all Indigenous people aged 50 years or older. From 2005 vaccination was funded for all Australians aged 65 years or more.

Extent of pneumococcal disease among Indigenous people

Indigenous children and adults have a significantly higher incidence of pneumococcal disease than non-Indigenous people, but detailed data are available only for IPD, which has been notifiable Australia-wide since 2001 (since 1997 in Queensland and the NT) [72, 98].

Based on notifications for people living in NSW, NT, WA and SA in 2001-2002, the incidence of IPD among Indigenous people (45 per 100,000) was 4.5 times that among other people (10 per 100,000) [98]. For both Indigenous and other people, notification rates were highest in the 0-4 years age group (87 per 100,000 for Indigenous people and 49 per 100,000 for other people) and in the 50 years and over age group (59 per 100,000 compared with 14 per 100,000). Importantly, the incidence among Indigenous people aged 25-49 years was also very high, with a rate (48 per 100,000) 12 times higher than that among other people (4 per 100,000). These aggregated data conceal important regional differences, with notification rates for Indigenous people being much higher in the NT (134 per 100,000 in 2004) compared with all jurisdictions combined (36 per 100,000) [99].

Vaccination programs have had a significant impact on the disparity in disease rates between Indigenous and non-Indigenous people. At the start of the national Indigenous childhood pneumococcal vaccination program in 2001, the rate among Indigenous children aged less than 2 years was 219 per 100,000, 2.9 times higher than among non-Indigenous children [99]. By 2004, the rate among Indigenous children had dropped to 92, much the same as the rate among non-Indigenous children. In Indigenous adults, IPD rates decreased after the introduction of vaccination programs in the Kimberley [100] and in North Queensland [101], but nationally rates remain higher for Indigenous adults than for non-Indigenous adults [99].

The high rates of IPD notifications among Indigenous people are reflected in hospitalisation rates for pneumococcal septicaemia and meningitis [98]. Of the 21 deaths from IPD for people living in Queensland, WA, SA and the NT in 2000-2002, five (24%) were identified as Indigenous. Two of the five deaths identified as Indigenous were of children aged less than 5 years.

Meningococcal disease

Meningococcal disease is caused by the bacterium Neisseria meningitidis (also known as meningococcus). Manifestations of meningococcal disease include meningitis, meningococcaemia without meningitis, and septic arthritis [98]. The risk of infection can be increased in crowded housing conditions [102]. The most common groups of meningococcus found in Australia are B (60%) and C (34%) [103]. Vaccination against serogroup C has been funded for all infants since 2003, with a catch-up program for all aged up to 19 years of age.

Extent of meningococcal disease among Indigenous people

The incidence of meningococcal disease is higher among Indigenous people than other Australians, and children aged less than five years are particularly susceptible [98]. Previously recorded outbreaks among Indigenous children in central Australia and north-west Queensland were due to types A and C [104], but recent data suggests that the disease in young children is now mainly due to serogroup B [97].

Almost 9% (92 cases) of the 1,067 cases of meningococcal disease notified in NSW, WA, SA and the NT in 2000-2002 were identified as Indigenous. More than 31% of all cases and almost 61% of cases identified as Indigenous occurred among children aged 4 years or younger. The rate of 51 per 100,000 for Indigenous children aged 0-4 years was 3.5 times the rate of 15 per 100,000 for their non-Indigenous counterparts. Overall, the standardised rate of 7.2 per 100,000 for Indigenous people was more than twice the rate of 3.4 per 100,000 for other Australians [98]. The national notification rate fell 29% from 2003 to 2004 [97]. While no data on Indigenous status have yet been published for this period, decreases would be expected in Indigenous and non-Indigenous cases.

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6 These jurisdictions are the only ones with reasonable levels of identification of Indigenous people in notifications. Indigenous rates have been compared with those for all other people, including those for whom Indigenous status was not known.
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There were 38 deaths from meningococcal disease for people living in Queensland, WA, SA and the NT in 2000-2002 [98]. Five of these deaths were of people identified as Indigenous, four of whom were aged 0-4 years.

Sexually transmitted infections

Sexually transmitted infections (STIs) are spread by heterosexual or homosexual contact with an infected person and most cases are found among sexually active teenagers and young adults [71]. Unprotected sex is a main risk factor for STIs. Infections that can be transmitted through sexual contact include gonorrhoea, syphilis, HIV/AIDS, hepatitis B, chlamydia, human papilloma virus (HPV), genital herpes and donovanosis. HPV and genital herpes are believed to be the most common STIs in Australia, but they are not notifiable diseases so it is difficult to monitor incidence [105].

Most STIs are asymptomatic or produce mild symptoms, and many people affected find out they have an infection through screening and contact tracing [106]. STIs can usually be effectively treated if diagnosed early, but, if left untreated, they may lead to complications.

Variations in notification rates over time may reflect real changes in incidence, but could be due also to the introduction of easier and more sensitive testing procedures, improved education encouraging notification reports from health authorities, and improved contact tracing [107].

Gonorrhoea

Gonorrhoea, which is caused by the bacterium Neisseria gonorrhoea and mainly affects the mucosal and glandular structures of the genital tract (cervix in women, urethra in men), is highly contagious [108]. It can cause pelvic inflammatory disease in women, which can result in ectopic pregnancy or sterility.

The notification rate of gonorrhoea for Indigenous people living in WA, SA and the NT in 2002-2004 was 1,464 cases per 100,000 population (based on 6,447 cases notified), compared with a rate of 17 per 100,000 (2,062 cases notified) for non-Indigenous people [109-111].

The disease can be successfully treated with oral antibiotics, but some strains of N. gonorrhoea in urban Australia are penicillin-resistant [106]. Ceftriaxone is used as treatment in communities in Queensland, for example, where penicillin resistant strains have been found [112]. People with gonorrhoea often also have chlamydia, so the infections are often treated at the same time.

Syphilis

Syphilis, which is caused by the organism Treponema pallidum, is an STI that has primary, secondary, latent, and tertiary stages [113]. The infection is especially contagious during the primary phase, when sores are present and is generally not contagious during the latent phases. Untreated syphilis can lead to serious damage of the nervous system and other body organs, or to death. Penicillin is the usual treatment [106].

The notification rate of syphilis for Indigenous people living in WA, SA and the NT in 2002-2004 was 299 cases per 100,000 population (based on 1,378 cases notified), compared with a rate of 1.3 per 100,000 (1,046 cases notified) for non-Indigenous people [109-111].

Chlamydia

Chlamydia, which is caused by the bacterium Chlamydia trachomatis, is one of the most common STIs in Australia [106]. The infection in women can cause cervicitis, endometritis, and pelvic inflammatory disease, which can lead to tubal factor infertility and ectopic pregnancy. In men, it can cause urethritis, epididymo-orchitis, and prostatitis. Azithromycin treatment for chlamydial infection has been a major advance. Due to lack of obvious symptoms of the disease, the incidence of chlamydia is underestimated by notification data.

Notification rates for chlamydia were much higher for Indigenous people living in WA, SA and the NT in 2002-2004 than for their non-Indigenous counterparts: 1,277 cases per 100,000 population (based on 5,892 cases notified) compared with 98 per 100,000 (10,354 cases notified) [109-111].

HIV / AIDS

Australia has so far successfully prevented an uncontrolled spread of HIV (human immunodeficiency virus) and the overall rates of HIV and AIDS (acquired immune deficiency syndrome) are low in comparison with other countries [109]. However, great concerns have been expressed about the possible impact of HIV/AIDS among Indigenous people, for whom AIDS has been seen as having the potential ‘to further erode the social and economic fabric of Indigenous communities’ [114]. Indigenous people were seen as being at particular risk of HIV infection due to high rates of STIs and their lack of access to effective services [107].

HIV is transmitted from person to person through the exchange of blood and bodily fluids. In Australia, transmission occurs primarily through sexual contact between men. The virus can also be transmitted through: sexual contact between men and women; sharing of needles and/or syringes (primarily for drug injection) with someone who is infected; and, very rarely in
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countries like Australia where blood is screened for HIV antibodies, through transfusions of infected blood or blood clotting factors. Babies born to HIV-infected women may become infected before or during birth or through breast-feeding after birth.

HIV/AIDS among Indigenous people

The notification rates for HIV infection for Indigenous and non-Indigenous people have declined at similar rates over the past decade or so. The rates for 2000-2004 – 4.1 cases per 100,000 for Indigenous people and 3.8 per 100,000 for non-Indigenous people – were slightly lower than those for 1995-1999 – 4.3 and 4.1 per 100,000 respectively [Derived from 111]. These rates are lower than those reported for 1992-1998: 5.2 per 100,000 for Indigenous people and 5.5 per 100,000 for non-Indigenous people [115].

Trends in the rates of AIDS diagnoses differ between Indigenous and non-Indigenous people: there was no change in the rate of 1.7 cases per 100,000 for Indigenous people between 1995-1999 and 2000-2004, whereas the rate for non-Indigenous people decreased from 2.6 to 1.2 per 100,000 [Derived from 111].

There have been some important differences between Indigenous and the total population in the characteristics of newly diagnosed HIV infection in terms of age at diagnosis and exposure categories over the ten-year period 1995-20047 [111]. The median age of diagnosis of HIV among Indigenous people has been 31 years over the ten-year period 1995-2004 compared with 33 years for the total population. In contrast to the total population, for which slightly more than 5% of diagnoses of HIV have occurred in females, almost 32% of cases reported among Indigenous people occurred in females. Infection was acquired by heterosexual contact in 37% of cases among Indigenous people and in only 8% of cases among the total population. Male homosexual contact was responsible for 82% of cases in the total population and for 39% in the Indigenous population, and male homosexual contact with injecting drug use for 5% and almost 8% respectively. Injecting drug use without male homosexual contact was responsible for 2% of cases in the total population and for more than 14% in the Indigenous population.

Overall in Australia, the cumulative number of HIV diagnoses by the end of 2004 was estimated to be 21,402 (after adjustment for reporting delay) [111]. For the same period, there were 9,618 AIDS cases and 6,590 deaths following AIDS (after adjustment for reporting delay). In comparison, there were 240 HIV notifications among the Indigenous population in the period 1992-2004 and 100 AIDS diagnoses.

Skin infections and infestations

Susceptibility to skin infections increases with poor living conditions and overcrowding [116]. Skin infections and infestations in Indigenous communities reflect serious health inequalities, but have attracted much less professional attention than they deserve. Scabies, a disease caused by the mite Sarcoptes scabiei resulting in inflammation and itching [117], is endemic in many remote Indigenous communities, with prevalence in children up to 50% [116, 118]. The cycles of scabies transmission can result in pyoderma (also referred to as impetigo), a bacterial infection of the skin that can lead to kidney disease and possibly heart disease. Up to 70% of children living in some Indigenous communities have skin sores, with group A streptococcus (GAS) the major pathogen [118]. GAS is responsible for continuing outbreaks of post-streptococcal glomerulonephritis and acute rheumatic fever. Indigenous people, particularly those living in the high-rainfall, humid areas of northern Australia, are also vulnerable to a variety of fungal and related organisms [117].

Skin diseases cause very few deaths directly, but they can be linked with serious complications. Skin diseases accounted for around 2.5% of hospital separations in 2002-03 for patients identified as Indigenous, at a rate around two-and-a-half times that of non-Indigenous people [63].

Gastroenteritis

Gastrointestinal infections and infestations, particularly those causing diarrhoea, are still significant causes of morbidity among Indigenous children [119].

Diarrhoea, usually referred to as gastroenteritis, is not a major problem among non-Indigenous children in Australia, but it remains a common cause of morbidity for Indigenous children. The greater impact of gastroenteritis among Indigenous than among non-Indigenous children is reflected in hospitalisation data. Unfortunately, detailed data are available only for WA: these data reveal that separation rates for gastroenteritis in the first two years of life were around 10 times higher for Indigenous children than for non-Indigenous children in the seven-year period 1994-2000 [120]. Separation rates in WA in 2000 were 147 per 1,000 for Indigenous infants (less than 12 months of age) and 114 per 1,000 for Indigenous children in their second year of life. Rates for children aged between 2 and 10 years were considerably lower, but the Indigenous:non-Indigenous rate ratios were around 2-3 in 1994-2000. Separation rates in WA in 2000 were considerably higher for Indigenous infants living outside the Perth metropolitan area (184 per 1,000) than for metropolitan residents (69 per 1,000) [120].

7 Note figures have not been adjusted for reporting delay. The figures quoted here are aggregated nationally, and may conceal differences across Australia, particularly between rural/remote and urban areas, for which the patterns may be quite different.

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Hospital separation rates for gastroenteritis in WA declined by around 22% between 1994 and 2000 for both Indigenous and non-Indigenous infants [120]. The declines in rates were slightly higher for children in their second year of life: 31% for Indigenous children and 25% for non-Indigenous children. The declines in rates were slightly higher for children living outside the Perth metropolitan area than for metropolitan residents.

Around one-third of 1,001 infants born in WA in 1995 and 1996 who had an index hospital admission for gastroenteritis during their first year of life were Indigenous [121]. Follow-up of this group of infants until 31 May 2002 revealed that 58% of children admitted more than once were Indigenous. Overall, Indigenous children made up more than 38% of all hospital admissions for gastroenteritis. Compared with non-Indigenous children admitted for gastroenteritis, Indigenous children were more likely to: be seriously dehydrated on admission (36% compared with 24%); be undernourished (13% compared with 4%); have iron deficiency anaemia (8% compared with 1%); and have gastrointestinal carbohydrate intolerance (10% compared with 5%).

Similar measures of serious illness were documented among children admitted to Royal Darwin Hospital in 1997–98: half of the 44 Indigenous children hospitalised for diarrhoea were acidicotic, 32 had moderate to severe hypokalaemia, and 37 had dehydration equivalent to a loss of more than 5% of body weight [122]. Many of the children had an underlying intestinal enteropathy characterised by partial atrophy of the small intestinal villi, which also contributed to gastrointestinal carbohydrate intolerance.

Another expression of the decline in gastroenteritis among Indigenous children, at least in terms of severity, is the marked reductions in mortality. In the period 1970-1979, there were 69 deaths of Indigenous children in hospital in WA from gastroenteritis (53 were infants) [120]. In the period 1980-1989, there were nine Indigenous deaths (six infants), but none in the period 1990-2000.

Eye health

There has been progress in improving the eye health of Indigenous people, but many Indigenous people are still more likely than non-Indigenous people to suffer from preventable conditions, such as trachoma (a bacterial infection) [123, 124].

Of increasing concern for many Indigenous people is diabetic retinopathy, a complication of diabetes that causes damage to the small blood vessels in the retina, can impair vision and may cause blindness [123, 125].

The eye health of many Indigenous people is also limited by difficulty in accessing optometrist or specialist services [126]. For those with refractive error, for example, the main issues are access to and utilisation of testing, cost of spectacles, the administrative difficulty of dispensing, and the repair of spectacles. Eye health can be affected by genetic factors, ageing, premature birth, diseases (such as diabetes) smoking, injuries, UV exposure and nutrition.

Extent of eye health problems among Indigenous people

Eye and/or sight problems were reported by 30% of Indigenous people who participated in the 2004-2005 NATSIHS [27]. These problems were reported slightly less frequently by Indigenous people living in remote areas (25%) than by those living in non-remote areas (32%). The proportion of eye and/or sight problems reported by Indigenous people living in non-remote areas is slightly higher than the proportion found in the 1995 NHS (28%), but the overall proportions of Indigenous people who reported having an eye and/or sight problem to the 2001 NHS and the 2004-2005 NATSIHS were similar [27].

After adjusting for differences in the age structures of the two populations, eye and/or sight problems overall were slightly more common for non-Indigenous than for Indigenous people. On the other hand, two serious problems – blindness and cataract – were around one-and-a-half times more common for Indigenous than for non-Indigenous people.

Overall, a slightly lower proportion of Torres Strait Islander (26%) than Aboriginal people (30%) reported having an eye and/or sight problem, but the proportion was 31% for Torres Strait Islanders living in the Torres Strait area [27].

According to the WAACHS, 8% of Indigenous children aged 4-17 years did not have normal vision in both eyes (a level significantly lower than the 14% of children in the general population found in the 1993 WA Child Health Survey not to have normal vision in both eyes) [14]. Of the 4-17 year-old Aboriginal children without normal vision in both eyes, 58% used prescribed glasses or contact lenses.

In Australia, trachoma is found almost exclusively within the Indigenous population, either in its infectious (follicular) form or as scarring (resulting from repeated infections over years) [124, 126].

Until recently, it had been difficult to develop an accurate picture of where infectious trachoma remains endemic because of the lack of systematic screening. The establishment in November 2006 of the National Trachoma Surveillance and Reporting Unit 8

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8 Defined as less than the third percentile of World Health Organization reference values.

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(NTSRU), however, means that good information will now available for children living in many parts of WA, SA and the NT [127]. It its first report in December 2007, based on data collected largely before its establishment, the NTSRU has confirmed that infectious trachoma among Indigenous children is still endemic across many remote parts of the country, particularly in central and north-western Australia. The areas with the highest prevalence of active trachoma were the Pilbara, WA, 53%, and Katherine, NT, 30%, but the prevalence was also reported at around 20% for the Kimberley, Midwest and Goldfields regions of WA, the Barkley and Alice Springs Remote regions of the NT, and for the far north-west of SA and the area around Yalata in western SA.

The prevalence of infectious trachoma is much less common among adults, but 20 (1.2%) of 1,651 Indigenous adults screened by the South Australian Eye Health Program in remote SA in 1999-2004 had evidence of active trachoma [128]. Trachomatous scarring (lid scarring, trichiasis or corneal opacity) was found in 260 adults (16%). An even higher level of trachomatous scarring (65%) was documented among 181 adults who attended general ophthalmological outreach clinics to 16 Indigenous communities in remote central Australia in 2003 [129].

There are very limited data available on the prevalence of diabetic retinopathy in the Indigenous population [126], but a cross-sectional study in the Katherine region in 1993 and 1996 found that the crude prevalences of diabetic retinopathy (21%) and vision-threatening retinopathy (7-8%) among Indigenous people with diabetes were similar to those reported for non-Indigenous people with diabetes [130]. The study of 1,651 Indigenous adults living in remote SA in 1999-2004 included 771 people with diabetes, 197 (22%) of whom had features of diabetic retinopathy [128]. Fourteen (8%) of people with diabetic retinopathy had clinically significant macula oedema (CSMO).

Ear health

Ear infections are the most common type of illness in babies and young children, and three out of four children experience some form of otitis media (OM) by the time they are 3 years of age [131]. OM, which often occurs as a result of another illness (involving viruses or bacteria or both), is a common disorder in both developed and developing countries [132], but its form, onset, and natural history vary from population to population [133]. In developed countries, OM with effusion is prevalent and considered a major problem. In contrast, in developing countries acute and chronic suppurative forms of OM are much more common [134]. The pattern of OM observed among many Indigenous communities differs from that typically observed in the developed world, being more similar to that seen among disadvantaged populations in developing countries [135]. The high prevalence of OM among Aboriginal people is well established, and suppurative OM is of greatest concern.9 OM, particularly suppurative forms, is associated with some impairment of hearing, with major implications for language development and learning difficulties [134, 136]. The risk of permanent hearing loss increases if OM is not adequately treated and followed up. The hearing impairment associated with OM is generally conductive in nature10 and mild to moderate in degree, and may be intermittent or persistent depending on the middle-ear condition present at the time [134, 137].

Extent of ear disease among Indigenous people

The level of ear disease and hearing loss among Indigenous people remains higher than that of the general Australian population, particularly among children and young adults [134, 138].

Ear/hearing problems were reported by 12% of Indigenous people who participated in the 2004-2005 NATSIHS [27]. These problems were reported slightly more frequently by Indigenous people living in remote areas (13%) than by those living in non-remote areas (12%), but the difference is not statistically significant. The proportions represent a slight, statistically significant decrease from those reported to the 2001 NHS.

Complete or partial deafness was reported by 9% of Indigenous people living in both remote and non-remote areas, but the level of otitis media was higher for Indigenous people living in remote areas (4%) than for those living in non-remote areas (2%).

After adjusting for differences in the age structures of the two populations, otitis media was around 2.8 times more common for Indigenous people than for non-Indigenous people [27]. An overall comparative figure for complete or partial deafness was not published, but the levels were higher for Indigenous than for non-Indigenous people for all age groups except people aged 55

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9 As with all areas of Indigenous health, there is considerable diversity in the impact of ear disease among Indigenous people across Australia. In particular, ear disease has not been identified as a major problem among Torres Strait Islander people. The patterns described in this section do not apply to all Indigenous people, but they are characteristic for many Indigenous communities, particularly those in remote parts of the country.

10 Some literature suggests that chronic discharge may lead also to sensorineural hearing loss [121]. Sensorineural hearing loss is permanent and is commonly caused by nerve damage that impedes the transmission of sound from the inner ear to the brain. When conductive and sensorineural hearing loss coexist, the hearing loss is referred to as 'mixed'.

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years or older (for which group the levels were similar – 25% compared with 26%). The levels of complete or partial deafness among Indigenous people were around two times or more those among non-Indigenous people for age groups up to 34 years.

The proportions of ear/hearing problems were similar for Torres Strait Islanders (11%) and Aboriginal people (12%) overall, but the proportion for Torres Strait Islanders living in the Torres Strait area was slightly lower (9%) [27].

The more detailed information collected by the WAACHS reveals that 18% of Indigenous children aged 0-17 years had recurring ear infections [14]. Children 0-11 years were more likely (20%) to have recurring ear infections than children aged 12-17 years (14%). Abnormal hearing was reported by carers for 7% of the children aged 4-17 years. Of children with recurring ear infections with discharge, 28% had abnormal hearing compared with 1% of those without ear infections.

These differences are not fully reflected in overall hospitalisation rates for ear and hearing problems, which were similar for Indigenous and non-Indigenous people in 2000-01 [36]. There were, however, more separations for Indigenous people (67%) due to otitis media than for non-Indigenous people (60%). For Indigenous hospitalisations, a further 14% were for ear problems due to perforation of the tympanic membrane (compared with 7% for non-Indigenous people).

As is the case with knowledge about most specific health conditions, the most valuable information about ear disease comes from specific studies, which have found particularly high levels of OM among Indigenous people living in rural and remote communities and lower levels for those living in urban areas (see [138] for a detailed review of the various studies). OM can affect Indigenous babies within weeks of birth and a high proportion of children will continue to suffer from CSOM throughout their developmental years [139]. Individual studies have documented very high levels of CSOM in some Indigenous communities. The WHO has identified a prevalence of CSOM of greater than 4% as being ‘a massive public health problem’ requiring ‘urgent attention’ [140, p.29]: some Indigenous communities had a prevalence up to 10 times higher than this [136, 141].

The higher levels of OM that Indigenous people experience in their childhood years are reflected in a higher frequency of hearing loss, which have been documented in numerous studies (see [138] for a detailed review of the studies).

As with many other areas of Indigenous health, this massive public health problem will be solved ‘only with urgent attention to improving housing and access to running water, nutrition and quality of care, and giving communities greater control over these improvements’ [136, p.178]

Oral health

Oral health is defined as ‘a standard of health of the oral and related tissues that enables an individual to eat, speak, and socialise without active disease, discomfort, or embarrassment and that contributes to general wellbeing’ [142]. Thus, it is more than simply the absence of disease in the oral cavity: it is a standard of oral functioning that enables comfortable participation in everyday activities.

Two major threats to oral health are dental caries and periodontal diseases. Dental caries is caused by acid-producing bacteria living in the mouth, which proliferate on sweet and sticky food [143]. Caries is reversible in its early stages, but, if untreated, can cause irreversible damage. Periodontal diseases (affecting the gums) are caused by bacterial infection associated with poor oral hygiene, infrequent dental visits, age, smoking, low education and income levels, and certain medical conditions [143], especially diabetes mellitus [144] and osteoporosis [145].
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Extent of oral health problems among Indigenous people

Most information available about oral health in the Indigenous population relates to dental caries among children, and there is limited information about the oral health of adults. Generally the extent of caries in deciduous teeth among young Indigenous children has been increasing, whereas it has been declining for their non-Indigenous counterparts [146].

According to the WAACHS, an estimated 19% of Aboriginal and Torres Strait Islander children were reported by their carers to have holes in their teeth [14]. Prevalence of cavities was lowest for children 0-3 years (8%) and highest for children aged 4-7 years (31%). Carers reported 28% of children had never had a tooth filled and almost one-in-ten had had a tooth removed because it was not amenable to restorative dental care.

In the Child Dental Health Survey, Northern Territory 2000, considerably fewer Indigenous children than non-Indigenous children were found to have had no history of caries [147]. Indigenous children up to the age of 9 years old had approximately 3 to 4 times more decayed teeth than non-Indigenous children and dmft scores (for deciduous teeth) one-and-a-half to two-and-a-half times higher (two indices are used to measure caries: ‘dmft’ is the number of deciduous (baby) teeth (t) that are decayed (d), missing due to caries (m), or filled due to caries (f); and ‘DMFT’ is the corresponding index for permanent (adult) teeth.). For permanent teeth, Indigenous children had a higher mean number of decayed teeth and a higher mean DMFT score.

Dental decay in deciduous and permanent teeth of Indigenous children living in SA in 2001 was about twice the level for non-Indigenous children, and the proportion of dental decay that was untreated was also greater [36]. An earlier study in South Australia found that the lowest levels of dental decay in Indigenous children were in remote communities (mean dmfs = 1.0), with higher levels in other non-metropolitan areas (mean dmfs = 7.9) and in Adelaide (mean dmfs = 5.2) [148].

The mean number of teeth affected in Indigenous children aged 5-6 years living in the Anangu lands in the cross-border region of WA, SA and the NT (3.2) was more than twice that of children in the total Australian population (1.44) [149]. Compared with the decline in deciuous caries for children in the total population since 1987, Anangu children aged 5-9 years had experienced a 42% increase in the mean number of teeth affected. Anangu adults experienced low levels of dental caries, but tooth loss was found more frequently among adults with diabetes (mean 5.51) than non-diabetics (mean 1.53), and severe periodontal disease was more prevalent among diabetics (79%) than among non-diabetics (13.8%).

The extent of tooth loss and periodontal disease is higher among older Indigenous people than among their non-Indigenous counterparts [146]: around 16% of older Indigenous people had no natural teeth, compared with 10% of non-Indigenous people [150]. The extent of tooth loss results partly from the relatively poor periodontal health of Indigenous people aged 35 years or older [151]. The most common periodontal condition in Indigenous people aged less than 45 years accessing public dental services and Indigenous dental clinics was the presence of calculus (tartar) [36]. For people aged 45 years or older, 23% had periodontal pockets (space between the root of the tooth and the gums) of 6mm or more, and 25% had periodontal pockets of 4-5mm.

Disability

According to the WHO’s International Classification of Functioning, Disability and Health (ICF), disability is an umbrella term for impairments, activity limitations and participation restrictions [152]. Impairments are ‘problems in body function or structure such as significant deviation or loss’; activity limitations are ‘difficulties an individual may have in executing activities’; and participation restrictions are ‘problems an individual may experience in involvement in life situations’ [152, pp.7-10]. The ICF recognises that how these aspects impact on an individual are influenced by the ‘physical, social and attitudinal environment in which people live and conduct their lives’ [152, pp.16-17]. Thus, ICF emphasises functioning rather than disability, and views it as an outcome of interactions between health conditions (diseases, disorders and injuries) and contextual factors [153]. It also brings together the classifications of health and disability.

The AIHW is working on the application of the ICF to the classification of disability in Australia (see, for example, National Community Services Data Committee, 2004 [154]). However, much of the information available in Australia about functioning (disability) is based on the previous classifications that focused on disability and handicap. Much of this information is derived from the periodic surveys conducted by the ABS, but none of these surveys included sufficient numbers of Indigenous people to enable any definitive conclusions about disability. The ABS first survey to collect comprehensive information about disability (impairments, activity limitations and participation restrictions) among Indigenous people was its 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) [49].
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The extent of disability among Indigenous people

According to the 2002 NATSISS, almost 103,000 (36.5%) of Indigenous people aged 15 years or older reported that they had a disability or a long-term health condition [49]. The proportions reporting a disability or long-term health condition were similar for people living in remote (35.4%) and non-remote (36.9%) areas, and for males (36.9%) and females (36.1%) [155].

Having a disability or long-term health condition increased with age, with 73% of Indigenous males and 67% of Indigenous females aged 55 years or older reporting such a condition [49].

Importantly, more than 21,700 of the Indigenous people aged 15 years or older who reported they had a disability or a long-term health condition also reported having a profound or severe core activity limitation (they always or sometimes needed assistance with at least one activity of everyday living, including self-care, mobility or communication) [23, 155]. The proportions of people reporting having a core activity restriction were slightly higher for those living in remote areas than for those living in non-remote areas – profound: 4.0% compared with 2.9%; severe: 4.9% compared with 4.4% [49].

The nature of the questions that Indigenous people living in remote areas were asked about disability precludes comparisons with other surveys, but the level of profound or severe core activity limitation among Indigenous people aged 18 years of older living in non-remote areas was 2.1 times higher than the level among non-Indigenous people [23].

Health risk factors

The factors contributing to the poor health status of Indigenous people should be seen within the broad context of the ‘social determinants of health’ [156, 157]. These ‘determinants’, which are complex and interrelated, include income, education, employment, stress, social networks and support, social exclusion, working and living conditions, gender and behavioural aspects. Related to these are cultural factors, such as traditions, attitudes, beliefs, and customs. Together, these social and cultural factors also have a major influence on a person’s behaviour.

Information about some of these determinants is available (see ‘The context of Indigenous health’). As well, the 2002 NATSISS collected information about stressors experienced by Indigenous people in the previous 12 months [49].

The levels of these stressors and the indicators of the social disadvantage experienced by Indigenous people should be borne in mind in the interpretation of the following information about a number of specific health risk factors.

Nutrition

The nutritional status of Indigenous people is influenced by socio-economic disadvantage, and geographical, environmental and social factors [158]. Poor nutrition is a common risk factor for overweight and obesity, malnutrition, cardiovascular disease, type 2 diabetes, certain cancers, osteoporosis, and tooth decay [105, 159]. The National Health and Medical Research Council (NHMRC) has endorsed a number of dietary guidelines for infants, adolescents, adults, older Australians, women of childbearing age, and pregnant women [158].

According to the 2004-2005 NATSIHS, 46% of Indigenous respondents aged 12 years or older living in non-remote areas consumed one serve or less of fruit per day, compared with 39% of non-Indigenous respondents [Derived from 27]. (Separate information was not available about the proportions of people consuming at least two serves per day, the amount recommended by the NHMRC.)

Almost two-thirds of Indigenous and non-Indigenous people aged 12 years or older living in non-remote areas reported consuming 2-4 serves of vegetables per day, but only 10% of Indigenous respondents and 14% of non-Indigenous respondents consumed five serves or more per day (the NHMRC’s recommended minimum consumption) [Derived from 27].

Detailed information about the consumption of fruit and vegetables was not collected from remote-living respondents in the 2004-2005 NATSIHS, but the proportions of people who did not consume these dietary items daily was substantially higher for Indigenous people aged 12 years or older living in remote areas than for those living in non-remote areas – 15% and 2% respectively for vegetable consumption, and 20% and 12% respectively for fruit consumption [27].

More than three-quarters of Indigenous people aged 12 years or older living in non-remote areas reported that they usually drank whole milk (including full-cream powdered milk), with only 20% drinking reduced fat and/or skim milk [27]. In contrast, 45% of their non-Indigenous counterparts consumed reduced fat and/or skim milk and 45% whole milk. The consumption of reduced fat and/or skim milk was very low (6%) among Indigenous people aged 12 years or older living in remote areas, with 87% reporting that they drank whole milk.

More than four-fifths of Indigenous people aged 12 years or older living in remote areas reported ‘sometimes’ or ‘usually’ adding salt after cooking, compared with two-thirds of those living in non-remote areas [27].
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Physical activity
The National Physical Activity Guidelines for Australians currently recommend at least 30 minutes of moderate activity on at least five days of the week to reduce the risk of cardiovascular disease and other chronic conditions [26]. Insufficient levels of physical activity have shown to be a risk factor for cardiovascular disease, type 2 diabetes, certain cancers, depression, and overweight and obesity [160].

Data on the levels of physical activity of Indigenous people are limited [26], but 49% of respondents in the 2002 NATSISS reported participating in some sport or physical recreation activity in the previous 12 months [49]. This level of physical activity is higher than that documented in the 2001 NHS, in which 71% of Indigenous people and 68% of non-Indigenous people aged 15 years or older reported being sedentary or practising low levels of exercise [48].

Bodyweight
Body mass index (BMI – weight in kilograms divided by the square of height in metres) is the usual measure for classifying a person’s weight for height [12]. Being overweight (BMI between 25.0 to 29.9) or obese (BMI >= 30.0) increases a person’s risk for cardiovascular disease, type 2 diabetes, respiratory diseases, renal disease, certain cancers, osteoarthritis, pregnancy complications, and psychosocial problems [26]. A high BMI can be a result of poor nutrition, physical inactivity, socioeconomic disadvantage, genetic predisposition, increased age, and alcohol and tobacco use [26, 161]. Being underweight (BMI less than 18.5) can also have adverse health consequences, including decreased immunity (leading to increased susceptibility to some infectious diseases), osteoporosis (bone loss), decreased muscle strength, and hypothermia (lowered body temperature).

Based on information collected as a part of the 2004-2005 NATSIHS, 57% of Indigenous people aged 15 years or older were overweight or obese, with no real difference according to remoteness of residence [27]. The slightly higher proportion of Indigenous men (58%) than Indigenous women (55%) were overweight or obese. Almost 6% of Indigenous people aged 15 years or older were underweight, with 4% of Indigenous men and 7% of Indigenous women having a BMI of less than 18.5.

After adjusting for differences in the age structures of the two populations, the level of being overweight or obese was 1.2 times higher for Indigenous people aged 15 years or older than for their non-Indigenous counterparts [27].

Overweight and obesity were more common among Torres Strait Islanders aged 15 years or older (61%) than among Aboriginal people in that age range (56%) (the difference is not statistically significant) [27]. The level of overweight and obesity was particularly high among Torres Strait Islanders living in the Torres Strait area, with 86% having a BMI of 25.0 or greater.

Immunisation
In response to the greater burden of communicable diseases among Indigenous people, the NHMRC has endorsed a series of special guidelines and schedules for immunisation of vaccine-preventable diseases, which include some extra vaccinations [162].

Respondents to the 2004-2005 NATSIHS reported that 88% of Indigenous children aged 0-6 years living in non-remote areas were fully immunised against the vaccine-preventable diseases included in the relevant NHMRC vaccination schedule [27]. Based on available immunisation records, the level fully immunised would be somewhat lower, as the proportions for the separate vaccines were: diphtheria and tetanus (79%), whooping cough (74%), hepatitis B (83%), (79%), Hib (73%), and MMR (measles, mumps, and rubella) (85%).

Three-fifths of Indigenous people aged 50 years or older reported to the 2004-2005 NATSIHS that they had been vaccinated against influenza in the previous 12 months, with vaccination levels higher for people living in remote areas (80%) than for those living in non-remote areas (52%) [27]. All of these levels were higher than that for non-Indigenous people (46%). Similarly, vaccination levels for pneumonia in the previous 5 years were higher for Indigenous adults aged 50 years or older (remote: 56%; non-remote: 26%; all: 34%) than that for their non-Indigenous counterparts (20%).

Breastfeeding
Breast milk, which is the natural and optimum food for babies, contains proteins, fats and carbohydrates at levels that are appropriate for an infant’s metabolic capacities and growth requirements [158]. It also has anti-infective properties and contains immunoglobulins which provide some immunity against early childhood diseases [163].

According to the 2004-2005 NATSIHS, 79% of Indigenous children aged less than 4 years living in non-remote areas were reported to have been breastfed for at least some period [27]. This level is slightly lower than the 88% of non-Indigenous children aged less than 4 years who had been breastfed. On the other hand, mothers of Indigenous children reported in the WAACHS that they were more likely to initiate breastfeeding and breastfeed for longer than mothers in the general population, particularly those living in more isolated areas [14].
Tobacco smoking
Smoking tobacco increases the risk of cardiovascular disease, some cancers, lung diseases, and a variety of other health conditions [12]. Passive smoking is also of concern to health, with children particularly susceptible.

Around 50% of Indigenous people aged 18 years or older reported to the 2004-2005 NATSISS that they smoked daily, with the level being slightly higher for people living in remote areas (52%) than for those living in non-remote areas (49%) [27]. The level of smoking among Indigenous people has not really changed since at least 1995. The proportion of Indigenous men who smoked daily (51%) was slightly higher than the proportion of Indigenous women who did (49%).

The proportions of people smoking daily were similar for Torres Strait Islanders (49%) and Aboriginal people (50%) overall, but the proportion of daily smokers among Torres Strait Islanders living in the Torres Strait area was lower (38%) [27].

After adjusting for differences in the age structures of the two populations, daily smoking was 2.2 times more common among Indigenous people aged 15 years or older than among their non-Indigenous counterparts [27].

Surveys consistently reveal that the prevalence of smoking is higher among Indigenous people than among non-Indigenous people. The 2001 National Drug Strategy Household Survey, for example, found that 45% of Indigenous people aged 14 years or older smoked daily – more than twice the proportion of their non-Indigenous counterparts (19%) [164].

Alcohol use
Excessive alcohol use can contribute to liver disease, pancreatitis, diabetes, some cancers, epilepsy [36] and cardiovascular disease [12]. Alcohol use can also be a contributor to injury and violence [12]. Abstinence from drinking alcohol is advised for women when pregnant or breastfeeding [12]. Consumption in pregnancy can affect the unborn child leading to foetal alcohol syndrome (comprising abnormalities such as growth retardation, characteristic facial features, and central nervous system anomalies, including intellectual impairment) [165].

Surveys have shown consistently that Indigenous people are less likely to drink alcohol than non-Indigenous people, but those that do drink are more likely to consume it at hazardous levels [36].

These findings have been confirmed by the 2004-2005 NATSIHS, which found that the proportions of people aged 18 years or older who had never consumed alcohol or had not done so for more than 12 months was 24% for Indigenous people and 15% for non-Indigenous people [27]. Seventeen per cent of Indigenous men and 11% of Indigenous men aged 18 years or older had never consumed alcohol or had not done so in the previous 12 months; the proportions for Indigenous and non-Indigenous females were 30% and 20% respectively.

On the other hand, the proportions of people aged 18 years or older who consumed alcohol at a ‘high risk’ level were 8% for Indigenous people and 6% for non-Indigenous people (‘high risk’ is defined as daily consumption of more than six standard drinks for males and four for females) [27]. High risk alcohol consumption was reported for 11% of Indigenous males and 8% of non-Indigenous males, and for 6% of Indigenous females and 3% of non-Indigenous females.

Information about levels of total abstinence or abstinence for greater than 12 months and high risk consumption are not available by remoteness of residence, but consumption at risky and high risk levels (four standard drinks or more for males and two or more for females) were slightly higher for Indigenous people aged 18 years or older living in remote areas (17%) than for their counterparts living in remote areas (15%) (the difference is not statistically significant) [27]. Compared with results from the 2001 NHS, consumption at risky and high risk levels increased by five percentage points for Indigenous people living in non-remote areas and decreased by two percentage points for those living in non-remote areas.

Alcohol consumption at risky or high risk levels was more common among Aboriginal people aged 18 years or older (17%) than among Torres Strait Islanders in that age range (13%) (the difference is not statistically significant) [27]. The level of risky or high risk alcohol consumption was even among Torres Strait Islanders living in the Torres Strait area (9%).

Concluding comments
It is clear from this overview of current health status that Indigenous people remain the least healthy sub-population in Australia. Being a ‘snapshot’ of the most recent indicators of health status – with little attention to trends – the overview, however, doesn’t reflect the evidence that the health status of Australia’s Indigenous people continues to improve slowly.

For a start, there appear to have been slight reductions in mortality in recent years in a number of jurisdictions. Mortality appears to have declined in the period 1991-2002 for Indigenous people living in Western Australia (WA) and South Australia (SA) and the Northern Territory (NT) [28]. Crude death rates have declined in these three jurisdictions, with the decline for WA being statistically significant. Supporting evidence comes from the increase in age at death for the first quartile of deaths (the
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age below which 25% of all deaths occur). This aspect is consistent with the continuing slow declines in infant mortality (see below).

A separate analysis of trends in Indigenous mortality in the NT, the jurisdiction with by far the best quality data about Indigenous deaths, provides evidence of declines in death rates for some causes of death and a slowing in the increase in rates for others [166]. In the twelve-year period 1990-2001, the death rate for chronic obstructive pulmonary disease declined significantly. The death rates for stroke and renal failure for people aged less than 50 years also declined, but not significantly. On the other hand, the rates for ischaemic heart disease and diabetes mellitus increased significantly, but at lesser annual rates of change than documented for the period 1977-1989.

The survival rate of Indigenous infants has continued to improve slowly [28], after the period of sharp declines in infant mortality rates during the 1970s and 1980s [167].

The declines in infant mortality rates have occurred despite the lack of real changes in the birthweights of babies born to Indigenous mothers – the mean weights of babies are still around 200 grams less than the weights of babies born to non-Indigenous mothers. Importantly, the proportions of low birthweight (less than 2,500 grams) babies born to Indigenous mothers are still around twice those of babies born to other mothers.

Considerable improvements in the growth of Indigenous infants and young children appear to have occurred in many parts of the country, but those living in some remote areas (at least in the Kimberley region and the Top End) still experience the faltering pattern of growth documented in the 1960s [168].

In terms of specific health conditions, substantial improvements have occurred in the overall impact of many infectious diseases (partly due to immunisation programs) including:

- reductions in the impact of respiratory infections in childhood [68];
- substantial declines in death rates from pneumococcal pneumonia (mostly due to the introduction of vaccination programs) [72];
- reductions in the incidence and severity of trachoma (though inflammatory trachoma remains endemic in some remote communities of central and northern Australia) [124];
- marked reductions in notifications of donovonosis [71];
- a substantial reduction in the prevalence of hepatitis B virus infection (since the introduction of vaccination programs) [71];
- reductions in rates of hospitalisation for diarrhoeal disease and gastrointestinal infestations among Indigenous children [119];
- a rapid decline in the incidence of invasive Haemophilus influenzae type B (Hib) disease in Indigenous children (following the introduction of vaccination) [71]; and
- a reduction in the number of new cases of tuberculosis, from 79 in 1984 [169] to an average of around 40 in the early 2000s [80].

There is no doubt other evidence of improvement in health status, and of deterioration in some areas. But, clearly, the gap between the health status of Indigenous people and that of other Australians is still very, very wide.

A recent analysis of national health data for Indigenous populations in Australia, New Zealand, Canada and the United States of America found that ‘Australia ranks bottom in the league table of first-world nations working to improve the health and life expectancy of Indigenous people’ [170, p3]. The report noted that the poor health status of Indigenous Australians is related to ‘social and economic factors: diseases triggered by poverty; overcrowded housing; poor sanitation; lack of access to education; poor access to medical care for accurate diagnosis and treatment; and poor nutrition’ and called for ‘Federal, State and Territory leaders from all sides of politics to commit to an agreed time frame for achieving health equality’.

Commonwealth, State and Territory leaders have already agreed to redressing Indigenous disadvantage [171]. As part of its responsibility to COAG, the Australian Health Ministers’ Council endorsed in 2003 the National Strategic Framework for Aboriginal and Torres Strait Islander Health [172]. After concluding that ‘the devastating impact of poor health on Aboriginal and Torres Strait Islander peoples and communities cannot go on’ the Commonwealth, State and Territory ministers for health committed themselves to ‘a long-term collaborative approach to addressing the health status of Aboriginal and Torres Strait Islander people as a matter of urgency. It is time to work together across governments and across portfolios in a spirit of bipartisanship and in full collaboration with Aboriginal and Torres Strait Islander health leaders and communities to progress long-term strategies for sustainable outcomes’ [172, p2].

More recently, the Australian Government has made a commitment to ‘closing the gap’ in health between Indigenous and other Australians, which should be expected to flow into a national commitment through the Council of Australian Governments. These agreements and commitments need to be matched by comprehensive strategies, policies and timeframes – and real commitment by all sectors of government and the Australian people – for Australia to rise from the bottom in the league table of
first-world nations working to improve the health of Indigenous people and to ‘close the gap’ in health between Indigenous and other Australians
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Glossary

**age-specific death rate** number of deaths of persons of a specific age group in one year per 1,000 persons of the same age group

**age-specific fertility rate** the number of live births to women in a specified age group in one year per 1,000 women in the same age group

**age-standardisation** a procedure for adjusting rates (such as death rates) to minimise the effects of differences in age composition and facilitate valid comparison of rates for populations with different age compositions. See direct standardisation and indirect standardisation

**body mass index (BMI)** a measure calculated by dividing weight in kilograms by height in metres squared, and which categorises a person as ranging from underweight to obese: underweight (BMI: <18.5); normal (BMI: 18.5–24.9); overweight (BMI: 25.0–29.9); obese (BMI: 30.0+)

**direct standardisation** the procedure for adjusting rates in which the specific rates for a study population are averaged using as weights the distribution of a standard population

**excess deaths** the difference between the actual number of deaths occurring and the number expected from rates for the comparable population (the population used for comparison is most often the total Australian population or the total for the specific jurisdictions being considered)

**expectation of life** predicted number of years of life remaining to a person if the present pattern of mortality does not change. It is a statistical abstraction based on current age-specific death rates

**fertility rate** See age-specific fertility rate and total fertility rate.

**incidence** the number of instances of illness commencing, or of persons falling ill, during a given period in a specified population (see incidence rate)

**incidence rate** the number of instances of illness commencing, or of persons falling ill, during a given period in a specified population divided by the population at risk

**indirect standardisation** the procedure for adjusting rates in which the specific rates in a standard population are averaged using as weights the distribution of the study population

**infant mortality rate** number of infant deaths per 1,000 live births

**International Classification of Disease (ICD)** World Health Organization’s internationally accepted classification of death and disease

**life expectancy** See expectation of life

**maternal mortality ratio** number of maternal deaths divided by the number of confinements (in 100,000s)

**median age at death** the age above and below which 50% of deaths occurred

**morbidity** state of being diseased or otherwise unwell

**mortality** death

**prevalence** the number of instances of a given disease or other condition in a given population at a designated time

**risk factor** an attribute or exposure that is associated with an increased probability of a specified outcome, such as the occurrence of a disease. Not necessarily a causal factor

**standardisation** the process by which adjustments are made to take account of differences in the age structures of populations

**standardised mortality ratio (SMR)** the ratio of the observed number of deaths in a study population to the number expected if the study population had the same age-specific rates as a standard population. (The SMR is expressed sometimes as the ratio multiplied by 100.); see age-standardisation and indirect standardisation

**total fertility rate** the number of live births a woman would have if, throughout her reproductive years, she had children at the rates prevailing in the reference calendar year. It is the sum of the age-specific fertility rates for that calendar year

References


References


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Overview of Australian Indigenous health status, November 2008


South Australian Cancer Registry (1997) Epidemiology of cancer in South Australia. Adelaide: South Australian Cancer Registry


Condon J (2004) Cancer, health services and Indigenous Australians. (Consultant report no.5) Canberra: Office for Aboriginal and Torres Strait Islander Health


Overview of Australian Indigenous health status, November 2008

64 Standing Committee on Aboriginal and Torres Strait Islander Health, Statistical Information Management Committee (2006) National summary of the 2003 and 2004 jurisdictional reports against the Aboriginal and Torres Strait Islander health performance indicators. (AIHW category no. IHW 16) Canberra: Australian Institute of Health and Welfare

© Australian Indigenous HealthInfoNet 40 www.healthinfonet.ecu.edu.au
Overview of Australian Indigenous health status, November 2008


Overview of Australian Indigenous health status, November 2008


117 Green AC (2001) *A handbook of skin conditions in Aboriginal populations of Australia.* Asia: Blackwell Science Asia Pty Ltd


123 Taylor HR (1997) *Eye health in Aboriginal and Torres Strait Islander communities: the report of a review commissioned by the Commonwealth Minister for Health and Family Services, the Hon. Michael Wooldridge, MP.* Canberra: Commonwealth Department of Health and Family Services


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Overview of Australian Indigenous health status, November 2008

126 Taylor V, Ewald D, Liddle H, Warchivker I (2004) Review of the implementation of the National Aboriginal and Torres Strait Islander Eye Health Program. Canberra: Centre for Remote Health
139 Couzos S, Metcalf S, Murray RB (2001) Systematic review of existing evidence and primary care guidelines on the management of otitis media in Aboriginal and Torres Strait Islander populations. Canberra: Commonwealth Department of Health and Aged Care


National Health and Medical Research Council (2000) *Nutrition in Aboriginal and Torres Strait Islander peoples*. Canberra: National Health and Medical Research Council


O’Leary C (2002) *Fetal alcohol syndrome, a literature review*. Canberra: Commonwealth of Australia


National Aboriginal and Torres Strait Islander Health Council (2004) *National strategic framework for Aboriginal and Torres Strait Islander Health 2003-2013: framework for action by governments*. Canberra: NATSIHC
Abbreviations

ABS  Australian Bureau of Statistics
ACCHS Aboriginal community-controlled Health Service; see also AMS
ACEi Angiotensin-converting enzyme inhibitor
ACT Australian Capital Territory
AHS Australian Housing Survey
AIDS Acquired immune deficiency syndrome
AIHW Australian Institute of Health and Welfare
AMA Australian Medical Association
AMS Aboriginal Medical Service; see also ACCHS
ANCARD Australian National Council on AIDS and Related Diseases
ANZDATA Australia and New Zealand Dialysis and Transplant Registry
ASCO Australian Standard Classification of Occupations
ASGC Australian Standard Geographical Classification
ATSIC Aboriginal and Torres Strait Islander Commission
BMI Body mass index
CDEP Community Development Employment Projects scheme
CGC Commonwealth Grants Commission
CHINS Community Housing and Infrastructure Needs Survey
COAG Council of Australian Governments
CSOM Chronic suppurative otitis media
CVD Cardiovascular disease
dB Decibel
DMFT A count of the sum of teeth (T) that are decayed (D), missing due to caries (M), and filled due to caries (F)
dmft A count of the sum of deciduous (baby) teeth (t) that are decayed (d), missing due to caries (m), and filled due to caries (f)
ERP Estimated resident population
ESRD End-stage renal disease
GAS Group A streptococcus
HAV Hepatitis A virus
HBsAg Hepatitis B surface antigen (a serological marker for HBV)
HBV Hepatitis B virus
HCV Hepatitis C virus
Hib  *H. influenzae* type b
HIV Human immunodeficiency virus
HPV Human papilloma virus
ICD International Classification of Diseases - the World Health Organization's internationally accepted classification of death and disease
ICDH International Classification of Disability and Handicaps
ICF International Classification of Functioning, Disability and Health
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IDDM Insulin-dependent diabetes mellitus
IHO Indigenous Housing Organisations
IPD Invasive pneumococcal disease
ISDR Indirectly standardised death rate
IV Intravenous
LBW Low birthweight
mmol/L Millimoles per litre
MMR Maternal mortality ratio
NACCHO National Aboriginal Community Controlled Health Organisation
NATSIS (1994) National Aboriginal and Torres Strait Islander Survey
NATSISS (2002) National Aboriginal and Torres Strait Islander Social Survey
NHMRC National Health and Medical Research Council
NHS National Health Survey
NIDDM Non insulin-dependent diabetes mellitus
NNDSS National Notifiable Diseases Surveillance System
NSW New South Wales
NT Northern Territory
OATSIH Office for Aboriginal and Torres Strait Islander Health
OATSIHS Office for Aboriginal and Torres Strait Islander Health Services – the former name of OATSIH
OM Otitis media
Qld Queensland
RR Rate ratio- usually in this publication the Indigenous rate divided by the non-Indigenous rate
SA South Australia
SMR Standardised mortality ratio
STD Sexually transmitted disease; see STI
STI Sexually transmitted infection
Tas Tasmania
UK United Kingdom
UNICEF United Nations International Children's Emergency Fund
UV Ultraviolet
Vic Victoria
WA Western Australia
WAACHS Western Australian Aboriginal Child Health Survey
WHO World Health Organization

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