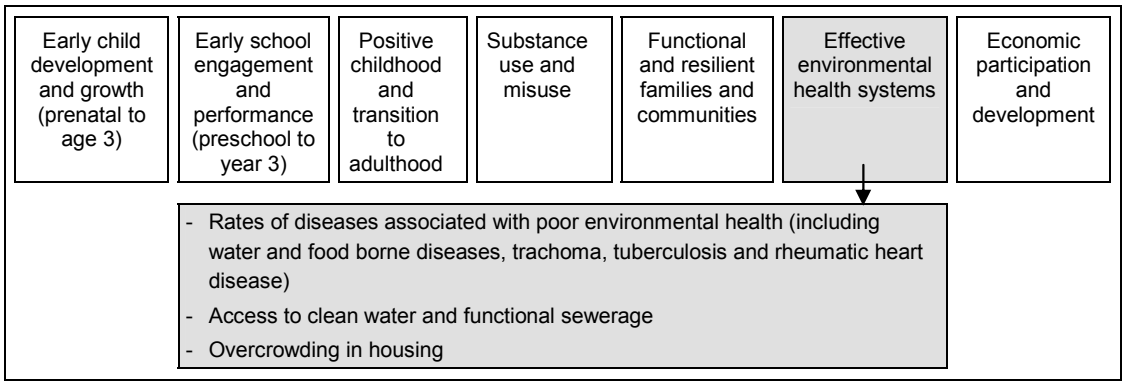
10 Effective environmental health systems

Strategic areas for action



A wide range of factors influence people's health and wellbeing. This section covers some of the key environmental influences on health, such as access to clean water, functional sewerage and appropriate housing conditions. These factors are sometimes referred to as 'health hardware' (DFACS 2003), and were identified, along with food supplies, as the key determinants of Indigenous ill health in the National Environmental Health Strategy (DHAC 1999). Many other environmental factors also influence health; for example, air quality, noise pollution, occupational health, food quality and pest control.

Some of the diseases that tend to have environmental causes are tuberculosis, rheumatic heart disease, respiratory diseases, urinary tract infections, kidney stones, intestinal worms, trachoma and intestinal infectious diseases (DHAC 1999; Pholeros, Rainow and Torzillo 1993). Social and biological factors also play a role (for example, vaccination against influenza, and nutrition and diabetes for general immunity to bacterial infections). Data on environment related diseases are examined in section 10.1.

A clean, sufficient and reliable supply of water is needed for drinking, hygienic food preparation and washing of people, clothes and bedding. Functional sewerage systems ensure that sewage does not contaminate drinking water supplies and is disposed of appropriately to prevent contact with people. Access to clean water and functional sewerage requires a combination of both functioning community

infrastructure as well as functioning household hardware such as taps, tubs and toilets. Section 10.2 contains information on access to clean water and functional sewerage.

Overcrowding in housing can have negative consequences not only for health, but also for education and family relationships. During consultations on the indicator framework for this Report, many Indigenous people spoke of the effect that overcrowding has on children's education and how it can contribute to family violence. Overcrowded houses are harder to keep clean and may suffer more wear and tear. With large numbers of people in a house, the bathroom, kitchen and laundry facilities may be inadequate for people to wash themselves, their food and kitchen utensils, and clothes and bedding as often as they would like. Washing and cleaning helps to prevent the spread of infectious diseases (see section 10.2). Section 10.3 contains information on overcrowding.

Attachment tables

Attachment tables for this chapter are identified in references throughout this chapter by an 'A' suffix (for example, table 10A.3.3). A list of attachment tables is in section 10.5. These tables can be found on the Review web page (www.pc.gov.au/gsp). Users can also contact the Secretariat to obtain the attachment tables.

10.1 Rates of diseases associated with poor environmental health

Box 10.1.1 **Key messages**

- Indigenous people had higher hospitalisation rates than non-Indigenous people for all diseases associated with poor environmental health (table 10.1.1).
- Between 2001-02 and 2004-05, hospitalisation rates for the 0–14 age group decreased for intestinal infectious diseases (24.5 per cent decrease), scabies (32.0 per cent decrease), acute upper respiratory infections (14.3 per cent decrease), and influenza and pneumonia (31.0 per cent decrease) (figure 10.1.3).
- Between 2001-02 and 2004-05, hospitalisation rates for older Indigenous people (65 years and over) increased for bacterial disease (9.9 per cent increase), influenza and pneumonia (31.8 per cent increase) and acute upper respiratory infections (16.6 per cent increase) (table 10A.1.2).
- In the four jurisdictions for which data are available, death rates from diseases associated with poor environmental health were much higher for Indigenous people (between 112.7 and 230.4 deaths per 100 000) than for non-Indigenous people (between 25.1 and 39.6 deaths per 100 000) (table 14A.1.4).

During the late 1800s and early 1900s, most public health efforts focused on the control of infectious diseases, particularly epidemics. Improvements in sanitation, drinking water quality, food safety, disease control and housing conditions resulted in big improvements to public health and longevity for most Australians (DHAC 1999).

However, many rural and remote Indigenous communities still struggle to achieve the basic level of environmental health that has been achieved for the rest of the population (DHAC 1999). Hospitalisation data indicate that diseases associated with poor environmental health are much more common among Indigenous people than non-Indigenous people (table 10.1.1). For example, some diseases, like trachoma, acute rheumatic fever and scabies continue to exist in Indigenous communities with very few occurrences evident in hospitalisations data for the non-Indigenous population.

The data used in this section are for hospitalisations, defined by the AIHW as discharges, transfers, deaths or changes in care type. Hospitalisations data reflect more serious cases of diseases, but do not necessarily show overall incidence of disease. Many people may not go to a hospital for all treatments. In addition, a patient in a remote area may be admitted to hospital whereas in an urban area the same patient could be managed as an outpatient. Hospital data can also include

some duplication, as patients can have multiple admissions for some chronic conditions, as well as changes in conditions (such as transfer from a medical ward to a rehabilitation centre within a hospital) (AIHW 2004).

Table 10.1.1 Age standardised hospitalisation rates (per 10 000) for selected types of diseases associated with poor environmental health, by Indigenous status, Queensland, WA, SA, and public hospitals in the NT, 2004-05[a, b, c]

	Indigenous			*Non-Indigenous*[d]			*Total Australians*		
ICD-10-AM diagnosis codes and descriptions	Males	Females	Total	Males	Females	Total	Males	Females	Total
Intestinal infectious diseases (A00–A09)	58.6	61.0	60.3	20.5	21.8	21.1	22.9	23.9	23.4
Tuberculosis (A15–A19)	6.4	1.5	3.7	0.5	0.3	0.4	0.6	0.4	0.5
Bacterial disease (A20–A49)	85.8	91.8	89.2	23.7	16.0	19.6	25.1	17.8	21.2
Diphtheria (A36)	0.5	0.2	0.4	–	–	–	–	–	–
Whooping cough (A37)	1.7	1.2	1.4	0.3	0.4	0.4	0.4	0.5	0.4
Meningococcal infection (A39)	0.4	0.6	0.5	0.2	0.2	0.2	0.3	0.2	0.2
Trachoma (A71)	–	0.6	0.4	–	–	–	–	–	–
Acute hepatitis A (B15)	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Acute hepatitis B (B16)	1.0	1.4	1.2	0.2	0.1	0.1	0.2	0.2	0.2
Scabies (B86)	35.1	41.0	38.1	0.3	0.2	0.2	1.5	1.7	1.6
Acute rheumatic fever (I00–I02)	2.0	3.9	3.0	0.1	–	–	0.2	0.2	0.2
Chronic rheumatic heart diseases (I05–I09)	4.1	8.0	6.1	1.0	1.2	1.1	1.2	1.5	1.3
Acute upper respiratory infections (J00–J06)	26.8	40.9	34.8	17.8	15.6	16.7	18.3	16.4	17.4
Influenza and pneumonia (J10–J18)	171.8	152.9	161.3	32.0	25.0	28.1	35.6	28.7	31.7

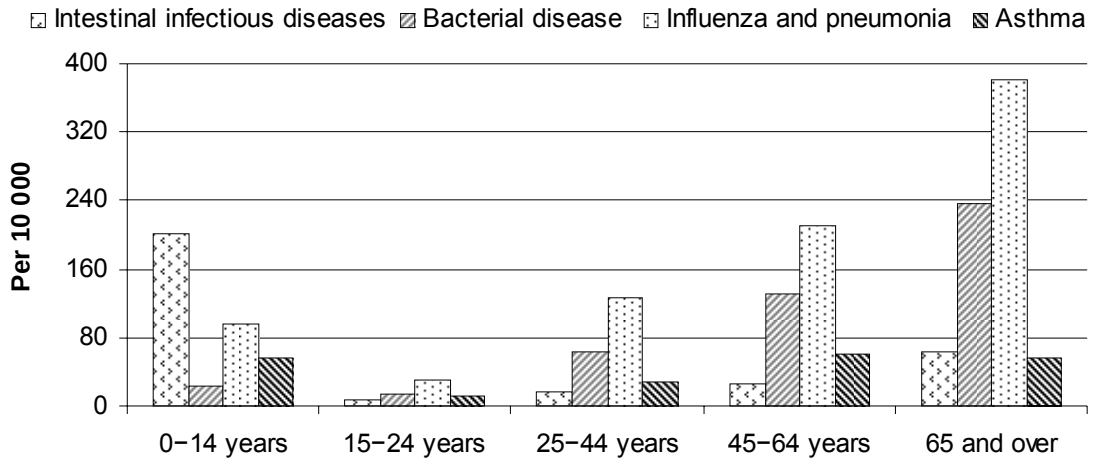
[a] Any diagnosis was used to select the infectious diseases (ICD-10-AM codes A00–B99), principal diagnosis was used to select the other conditions. [b] Identification of Indigenous patients is incomplete and completeness varies across jurisdictions. The AIHW has advised that only data for Queensland, WA, SA and the NT are considered to be acceptable for analytical purposes. Data for NSW, Victoria, Tasmania and the ACT were withheld by AIHW due to high rates of Indigenous under-identification (see chapter 2 and appendix 4 for more information). [c] Data are based on state of usual residence. [d] Non-Indigenous includes hospitalisations identified as not Indigenous as well as those with a 'not stated' Indigenous status. – Nil or rounded to zero.

Source: AIHW National Hospital Morbidity Database (unpublished); table 10A.1.1

After adjusting for age differences in the Indigenous and non-Indigenous populations, in those jurisdictions for which data were available, in 2004-05:

- Hospitalisation rates for all diseases associated with poor environmental health were higher for Indigenous than non-Indigenous people (table 10.1.1).
- The hospitalisation rate for influenza and pneumonia was 161.3 per 10 000 for Indigenous people — 5.7 times higher than for non-Indigenous people (28.1 per 10 000) (table 10.1.1).
- The hospitalisation rate for bacterial disease was 89.2 per 10 000 for Indigenous people — 4.5 times as high as the hospitalisation rate for the non-Indigenous population (19.6 per 10 000).
- The hospitalisation rate for intestinal infectious diseases for Indigenous people was almost three times the rate for non-Indigenous people — 60.3 per 10 000 compared with 21.1 per 10 000 for the non-Indigenous population.
- The biggest rate of difference recorded in hospitalisations between Indigenous and non-Indigenous people was for scabies. Indigenous people were 190 times more likely to present with scabies (38.1 per 10 000) than non-Indigenous people (0.2 per 10 000).
- Indigenous people also had much higher hospitalisation rates for chronic rheumatic heart diseases (6.1 per 10 000 compared with 1.1 per 10 000). Acute rheumatic fever appears to be a problem only in the Indigenous population (3.0 per 10 000 people) with almost no occurrences evident in hospitalisations data for non-Indigenous people.
- Acute upper respiratory infections were a problem for both the Indigenous and non-Indigenous populations, however, they were more prevalent for Indigenous people, where the hospitalisation rate was more than double that for non-Indigenous people (34.8 per 10 000 compared with 16.7 per 10 000).

Figure 10.1.1 **Hospitalisation rates for selected diseases associated with poor environmental health, Indigenous people, by age group, Queensland, WA, SA, and public hospitals in the NT, 2004-05[a, b]**



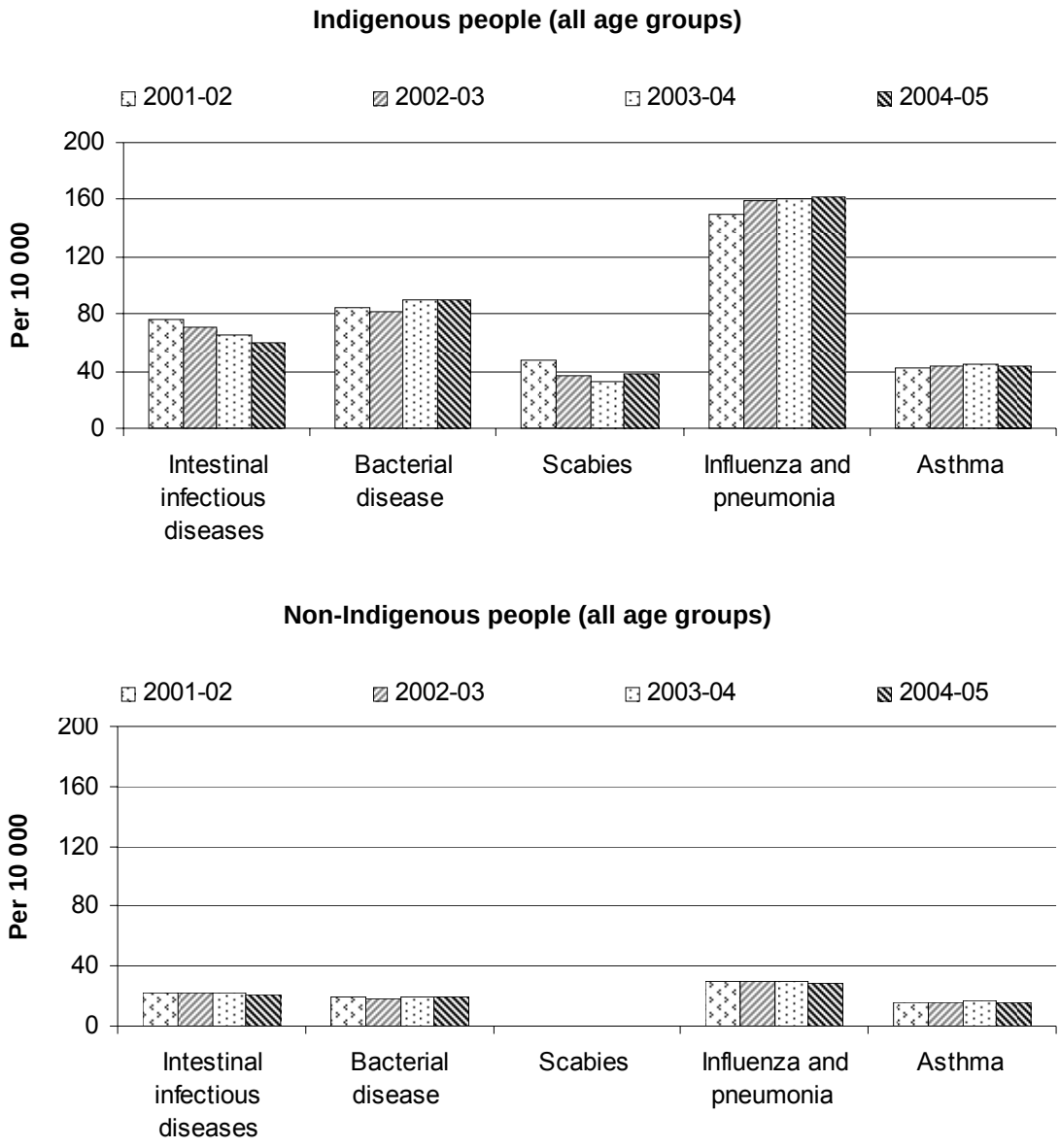
[a] Any diagnosis was used to select the infectious diseases (ICD-10-AM codes A00-B99), principal diagnosis was used to select the other conditions. [b] Identification of Indigenous patients is incomplete and completeness varies across jurisdictions. The AIHW has advised that only data for Queensland, WA, SA and the NT are considered to be acceptable for analytical purposes. Data for NSW, Victoria, Tasmania and the ACT were withheld by AIHW due to high rates of Indigenous under-identification (see chapter 2 and appendix 4 for more information).

Source: AIHW National Hospital Morbidity Database (unpublished); table 10A.1.1.

In those jurisdictions for which data were available:

- For the most common infectious diseases associated with poor environmental health, Indigenous children (0–14 years) and the elderly (65 years and over) had higher hospitalisation rates than other age groups in 2004-05 (figure 10.1.1). These age groups were also the most at risk in the non-Indigenous population (table 10A.1.1).
- Indigenous children had high rates of intestinal infectious diseases (200.6 per 10 000) compared to the older age groups in 2004-05 (figure 10.1.1).
- For older Indigenous people, influenza and pneumonia were most prevalent (381.2 per 10 000), followed by bacterial diseases (235.2 per 10 000) in 2004-05 (figure 10.1.1).
- While the hospitalisation rates for asthma were higher for the very young and the old, admissions for this cause was more even across age groups in 2004-05.

Figure 10.1.2 **Age standardised hospitalisation rates for selected diseases associated with poor environmental health, Queensland, WA, SA, and public hospitals in the NT[a, b]**



a Any diagnosis was used to select the infectious diseases (ICD-10-AM codes A00-B99), principal diagnosis was used to select the other conditions. **b** Identification of Indigenous patients is incomplete and completeness varies across jurisdictions. The AIHW has advised that only data for Queensland, WA, SA and the NT are considered to be acceptable for analytical purposes. Data for NSW, Victoria, Tasmania and the ACT were withheld by AIHW due to high rates of Indigenous under-identification (see chapter 2 and appendix 4 for more information).

Source: AIHW National Hospital Morbidity Database (unpublished); table 10A.1.2.

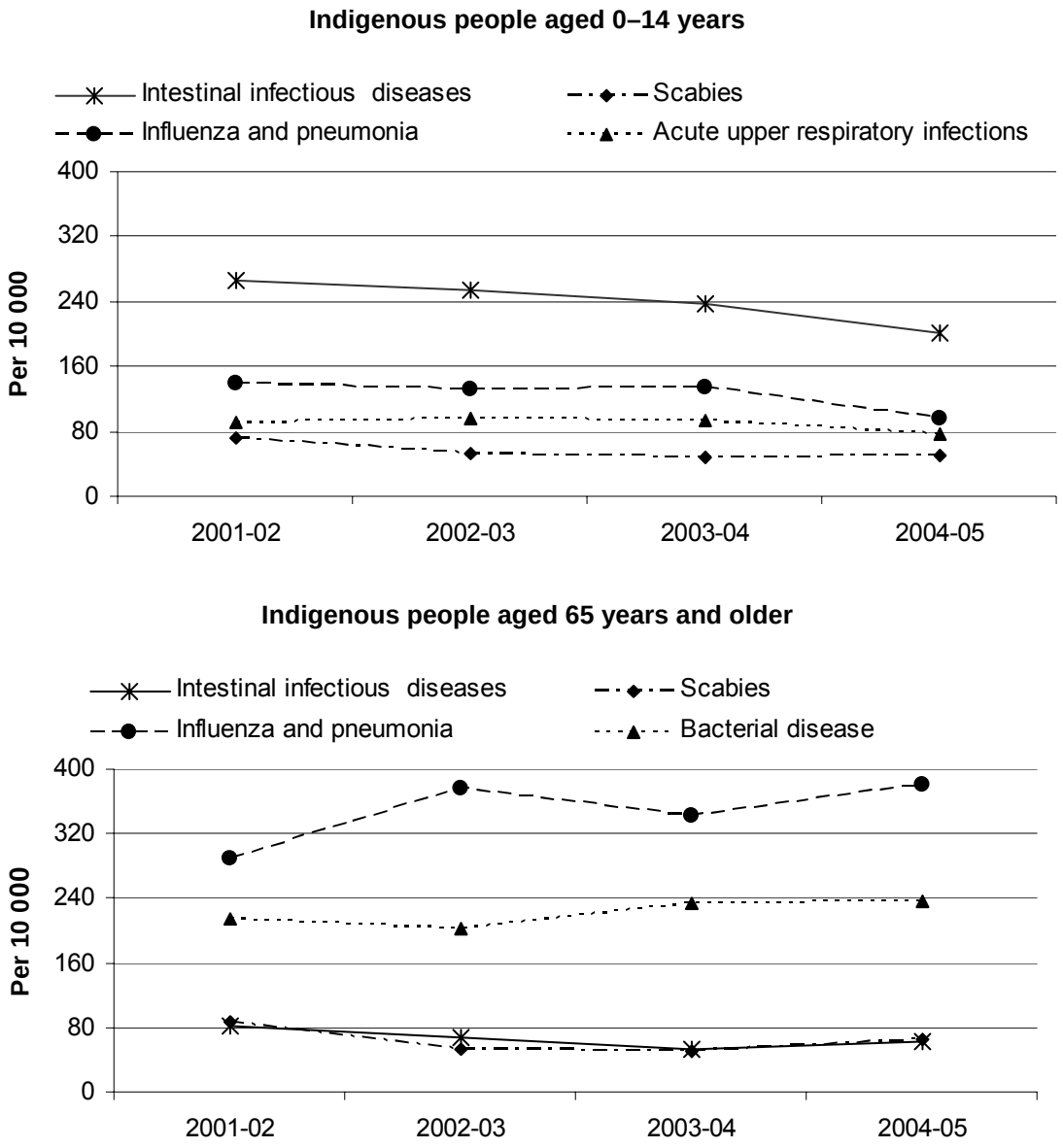
In those jurisdictions for which data were available:

- Figure 10.1.2 shows that hospitalisation rates for selected diseases associated with poor environmental health were much higher for Indigenous people than

non-Indigenous people between 2001-02 and 2004-05. Over time, the fluctuation in rates of the most common environmentally based diseases has been greater for Indigenous than non-Indigenous people. This may reflect the smaller size of the Indigenous population, where relatively small changes in the number of cases can make rates fluctuate more widely.

- Between 2001-02 and 2004-05, there was a decrease in hospitalisations for intestinal infectious diseases (21.2 per cent decrease) and scabies (19.9 per cent decrease) for Indigenous people.
- The number of Indigenous hospitalisations increased for bacterial diseases (6.3 per cent increase) and for influenza and pneumonia (7.8 per cent increase).
- Rates of acute upper respiratory infections and asthma remained steady between 2001-02 and 2004-05 for both Indigenous and non-Indigenous people, though the rates of disease were considerably higher for Indigenous people (table 10A.1.2).

Figure 10.1.3 **Hospitalisation rates for selected diseases associated with poor environmental health, vulnerable age groups of Indigenous people, Queensland, WA, SA, and public hospitals in the NT[a, b]**



a Any diagnosis was used to select the infectious diseases (ICD-10-AM (3rd edition) codes A00-B99), principal diagnosis was used to select the other conditions. **b** Identification of Indigenous patients is incomplete and completeness varies across jurisdictions. The AIHW has advised that only data for Queensland, WA, SA and the NT are considered to be acceptable for analytical purposes. Data for NSW, Victoria, Tasmania and the ACT were withheld by AIHW due to high rates of Indigenous under-identification (see chapter 2 and appendix 4 for more information).

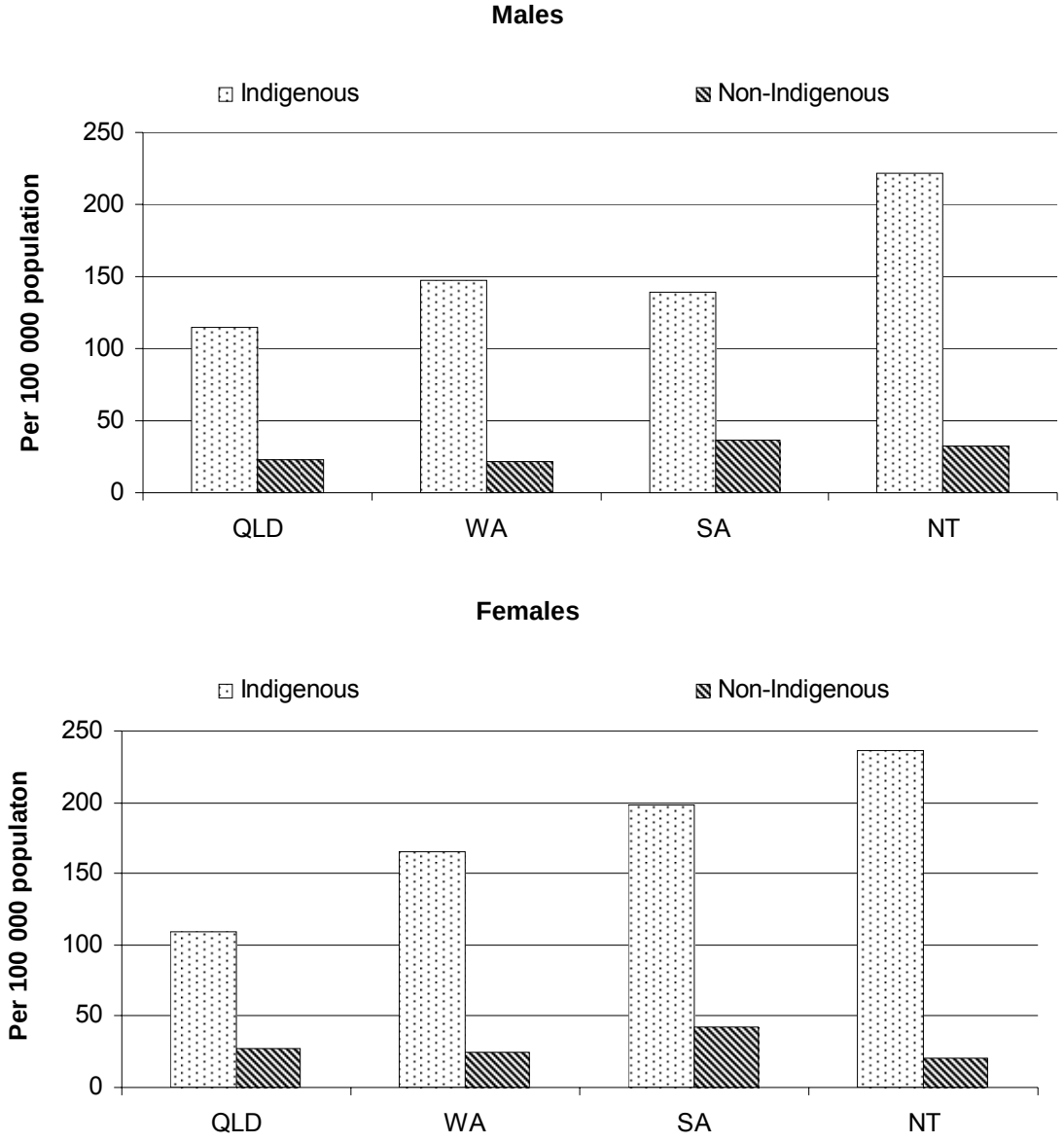
Source: AIHW National Hospital Morbidity Database (unpublished); table 10A.1.2.

In those jurisdictions for which data were available:

- Figure 10.1.3 shows hospitalisation rates for the four most commonly occurring diseases associated with poor environmental health for the two most vulnerable Indigenous age groups (0–14, and 65 and older) between 2001-02 and 2004-05.
- For the 0–14 age group, hospitalisation rates decreased for intestinal infectious diseases (24.5 per cent decrease), scabies (32.0 per cent decrease), acute upper respiratory infections (14.3 per cent decrease), and influenza and pneumonia (31.0 per cent decrease).
- Indigenous children (0–14 years) also showed a 10.7 per cent decrease in hospitalisation rates for bacterial disease, but hospitalisation rates for asthma increased by 6.2 per cent between 2001-02 and 2004-05 (table 10A.1.2).
- Older Indigenous people (65 years and over) showed increased hospitalisation rates for bacterial disease (9.9 per cent increase), influenza and pneumonia (31.8 per cent increase) and acute upper respiratory infections (16.6 per cent increase) between 2001-02 and 2004-05 (table 10A.1.2).
- The 65 years and over age group had decreased hospitalisation rates for intestinal infectious diseases (22.6 per cent decrease), scabies (26.8 per cent decrease) and asthma (17.5 per cent decrease) (table 10A.1.2).

Between 2001-02 and 2004-05, Indigenous males had higher rates of influenza and pneumonia than women. However, as hospitalisation rates for these diseases increased during the period for Indigenous women, the difference between the sexes diminished. Rates of bacterial diseases and scabies have fluctuated over time between the sexes. Men and women suffered roughly similar rates of intestinal infectious diseases between 2001-02 and 2004-05 (table 10A.1.3).

Figure 10.1.4 **Death rates from diseases associated with poor environmental health, age standardised, 2001–2005**[a, b, c]



a Care should be exercised when using these data as the rates are based on a small number of deaths. **b** Calculations of rates for the Indigenous population are based on ABS Experimental Projections, Aboriginal and Torres Strait Islander Australians (low series, 2001 base). There are no comparable population data for the non-Indigenous population. Calculations of rates for the non-Indigenous population are based on data derived by subtracting Indigenous population projections from total population estimates and should be used with care. **c** Data are subject to a degree of uncertainty and apparent differences in mortality estimates between jurisdictions may not be statistically significant.

Source: ABS Causes of Deaths 2005, Cat. no. 3303.0 (unpublished); table 10A.1.4.

In those jurisdictions for which data were available:

- Death rates from diseases associated with poor environmental health were much higher for Indigenous people (between 112.7 and 230.4 deaths per 100 000) than for non-Indigenous people (between 25.1 to 39.6 deaths per 100 000) (table 14A.1.4).
- Taking into account the different age structures of the Indigenous and non-Indigenous populations, between 2001 and 2005, Indigenous males had much higher death rates from diseases associated with poor environmental health (between 115.3 and 222.2 per 100 000) than non-Indigenous males (between 21.8 and 36.3 per 100 000) (figure 10.1.4).
- The death rates from diseases associated with poor environmental health were also much higher for Indigenous females than non-Indigenous females (between 108.9 and 237.0 per 100 000, compared with 21.0 to 42.9 per 100 000).

10.2 Access to clean water and functional sewerage

Box 10.2.1 **Key messages**

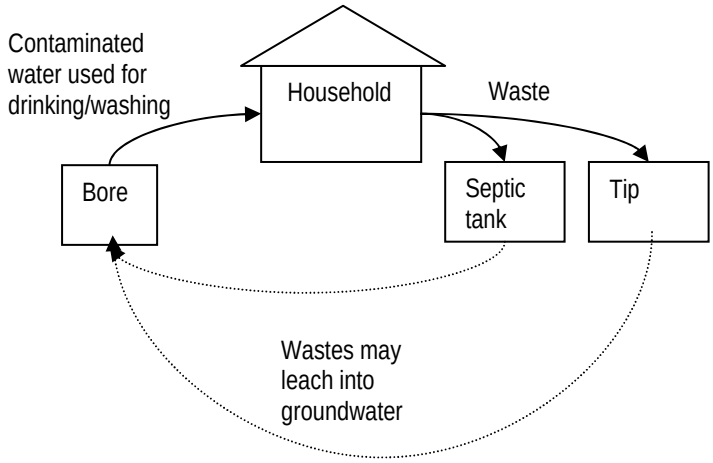
- The number of discrete Indigenous communities without an organised sewerage system decreased from 91 in 2001, to 25 in 2006 (table 10A.2.4).
- In 2006, of the 322 discrete Indigenous communities with a reported usual population of 50 or more in 2006:
  - 165 (51.2 per cent) had experienced water supply interruptions in the previous 12 months (table 10A.2.2)
  - 130 (40.4 per cent) had experienced sewerage overflows or leakages in the previous 12 months (table 10A.2.5).

This indicator complements the indicator of rates of diseases associated with poor environmental health. To prevent disease, a community needs a clean, adequate and reliable supply of water for drinking, cooking and washing. A functional sewerage system prevents sewage from contaminating drinking water and food.

Many Indigenous people live in urban areas where the water supply and sewerage systems are shared by all members of the community. While performance varies across Australia, cities and large towns generally monitor the quality of the drinking water and there are reticulated sewerage systems where wastes are collected and treated at central treatment plants.

In rural and remote areas, there is more reliance on individual household systems, like septic tanks and drinking water sourced from bores and rainwater tanks. If households are overcrowded and/or if these systems are not adequately maintained, wastes can leach into the groundwater and contaminate the drinking water, as shown in figure 10.1 below.

Figure 10.1 **Environmental health risks from inadequate or poorly maintained environmental health hardware**



Source: Adapted from ABS and AIHW 2005.

The Bureau of Rural Sciences has identified the two most important water quality risks as microbiological contamination and chemical contamination. Microbiological contamination is most commonly caused by septic waste discharges and/or livestock waste leaching into the waterway that supplies a bore. If this occurs, there is a risk that illness, usually infection, breaks out in the community. Chemical contamination is more likely to occur with surface water than groundwater and happens when chemicals like arsenic, uranium and nitrates leach into the water. Some chemicals and heavy metals occur naturally in soils and waters, but become hazardous to human health and the environment if concentrations become too high. Chemical contamination of drinking water usually causes chronic rather than acute health effects (Bureau of Rural Sciences 2005).

The 2005 Report used ABS 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) results to examine access to working water and sewerage facilities within households. Data from the ABS 2006 Community Housing and

Infrastructure Survey (CHINS) were released in mid-April 2007, and it has only been possible to include preliminary analysis of the data in this Report. More detailed exploration of the data may be possible in future Reports.

Box 10.2.2 **'Things that work' — the Aboriginal Communities Development Program**

In NSW, the Aboriginal Communities Development Program (ACDP) is investing $240 million over ten years to raise the health and living standards of selected, priority Aboriginal communities where major environmental health needs have been identified. Twenty-two Aboriginal priority communities are participating in a comprehensive program of capital works, which includes new housing, refurbishing and upgrading of existing housing, and upgrading essential safety infrastructure such as roads, footpaths and street lighting.

The Housing for Health program is a component of the ACDP, and focuses on immediate housing repairs to resolve health and safety concerns. By February 2007, 808 houses had been repaired under Housing for Health. Community people have been involved in surveying the houses and assisting local trades where possible.

The water and sewerage component of the ACDP is being undertaken with collaboration between state and local governments and Aboriginal people. The Tingha and Boggabilla communities have received new water and sewerage systems, which the local councils have agreed to maintain and service.

The ACDP has also resulted in 222 Aboriginal apprentices/trainees being employed within the 22 priority communities and 13 Aboriginal building companies being set up to employ the apprentices.

In 2006, ACDP won the NSW Premier's gold award for community development.

Source: NSW Cabinet office (unpublished).

Source of drinking water supply

In 2004-05, there were 384 water providers in the water supply industry in Australia. Of these, 235 were minor urban (fewer than 10 000 connections), 61 were non-major urban (between 10 000 and 50 000 connections), 29 were major urban (greater than 50 000 connections) and 59 were irrigation/rural (businesses that supply predominantly to agriculture) (ABS 2005). People who live outside areas serviced by utilities rely on other sources for their drinking water. While most Indigenous people live in cities and towns and receive the same water and sewerage services as non-Indigenous people, some live in small, discrete Indigenous communities.

In June 2006, an estimated 510 000 Indigenous people lived in Australia (ABS 2004). At the time of the 2006 CHINS, 92 960 people (which includes some non-Indigenous people)[1] lived in 1187 discrete Indigenous communities.[2]

Table 10.2.1 **Reported usual population in discrete Indigenous communities, by remoteness area 2006[a]**

	Communities with a population of:						
Remoteness area	*Less than 50*	*50–99*	*100–199*	*200–499*	*500–999*	*All communities*	*Reported usual population*
Major cities	2	–	2	–	–	4	346
Inner regional	5	5	8	1	–	19	1870
Outer regional	20	9	16	4	–	52	10 254
Remote	71	14	8	7	2	104	11 237
Very remote	767	95	58	59	17	1008	69 253
Australia	**865**	**123**	**92**	**71**	**19**	**1187**	**92 960**

a A community's usual population was generally estimated by the community representative without reference to community records. This methodology is considered to be less reliable than a population count as undertaken in the 2006 Census of Population and Housing. – Nil or rounded to zero.

Source: ABS 2006 CHINS, Cat. no. 4710.0.

In Australia in 2004-05, most (96 per cent) of the water supplied by the Australian water supply industry originated from inland surface water. Groundwater accounted for 4 per cent of the total water supplied. Most (89 per cent) of the total water consumed by households was distributed by an organised water supply, and 11 per cent was water from a self-extracted source (such as rainwater tanks and direct extraction from surface or groundwater) (ABS 2005).

In 694 discrete Indigenous communities (58.5 per cent), the most common source of drinking water is bore water, a decrease from 784 communities (64.5 per cent) in 2001. Between 2001 and 2006, the number of Indigenous communities that were connected to a town water supply increased from 186 to 209. Less common sources of drinking water (not part of a mainstream town supply) included rain water, rivers or reservoirs, wells or springs (ground water), carted water or some other organised supply. The number of communities with no organised water supply decreased from 22 (1.7 per cent) to 9 (0.8 per cent) between 2001 and 2006 (table 10A.2.1).

1 CHINS population data include both Indigenous and non-Indigenous people living in discrete Indigenous communities.

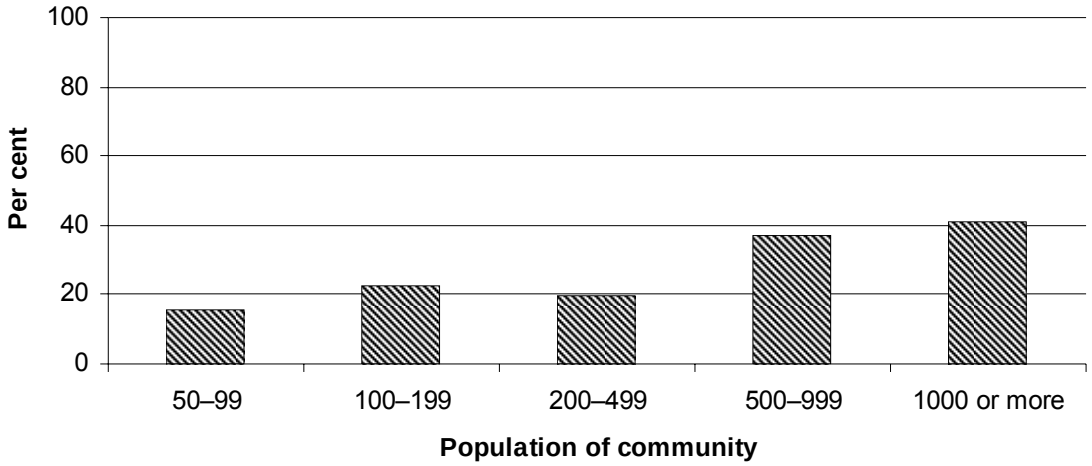
2 Discrete Indigenous communities are defined by the ABS as geographic locations inhabited by or intended to be inhabited predominantly (greater than 50 per cent of usual residents) by Aboriginal or Torres Strait Islander peoples, with housing or infrastructure that is managed on a community basis.

Reliability and adequacy of water supply

A reliable and adequate supply of water is essential for drinking, washing and hygienic food preparation and handling.

In 2006, the CHINS collected data on water restrictions and interruptions to water supply in discrete Indigenous communities.

Figure 10.2.1 **Experienced water restrictions, by reported usual population 2006,** [a, b, c]

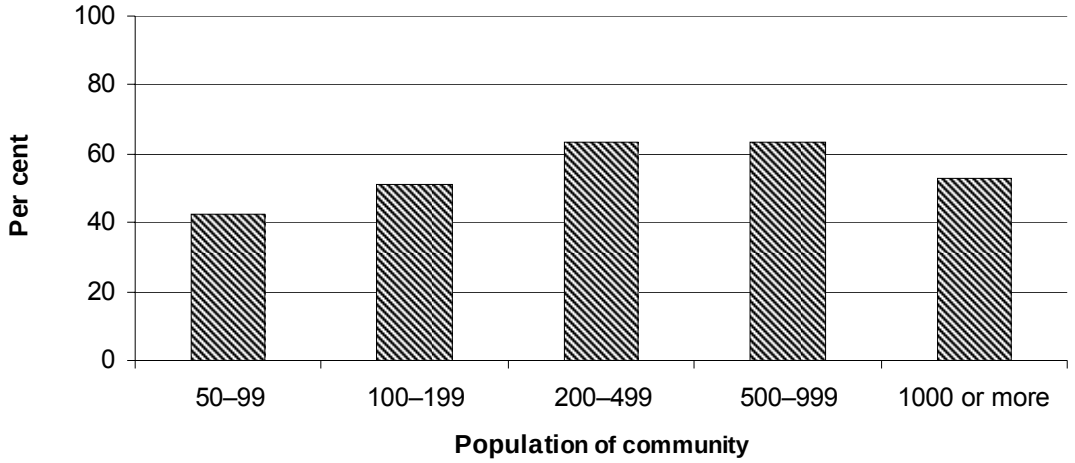


[a] In the 12 months prior to the survey. [b] Only a small proportion of communities with fewer than 50 people responded to this question, and the data are not included in the chart. [c] Cause of 'water restrictions' include 'drought', 'normal dry season', 'lack of storage containment', 'poor water quality' and 'other reasons'.

Source: ABS 2006 CHINS, Cat. no. 4710.0; table 10A.2.2.

- Water restrictions were more common in discrete Indigenous communities with larger populations. For example, 14 out of 36 Indigenous communities with a population of 500 or more (38.8 per cent), reported water restrictions in the previous 12 months (figure 10.2.1).
- Discrete Indigenous communities that had experienced water restrictions had a total reported usual population of 25 557 (table 10A2.2).

Figure 10.2.2 **Experienced water interruptions, by reported usual population 2006,** [a, b, c]



[a] In the 12 months prior to the survey. [b] Only a small proportion of communities with less than 50 people responded to this question, and the data are not included in the chart. [c] Causes of 'water interruptions' include 'equipment breakdown', 'ran out of water', 'lack of power', 'poor water quality', 'planned interruption' and 'other reasons'.

Source: ABS 2006 CHINS, Cat. no. 4710.0; table 10A.2.2.

- Figure 10.2.2 shows that in 2006, between 42.3 and 63.4 per cent of discrete Indigenous communities (depending on the size of the community) reported water interruptions in the previous 12 months.
- 165 communities with a reported usual population of 50 or more (51.2 per cent) had experienced water supply interruptions in the previous 12 months (table 10A.2.2).
- The total reported usual population of discrete Indigenous communities reporting water supply interruptions was 44 563 (table 10A.2.2).
- Of the 182 communities that reported water supply interruptions, 69 (37.9 per cent), with a total population of 21 291, had experienced five or more interruptions in the previous 12 months (table 10A.2.2).

Water quality

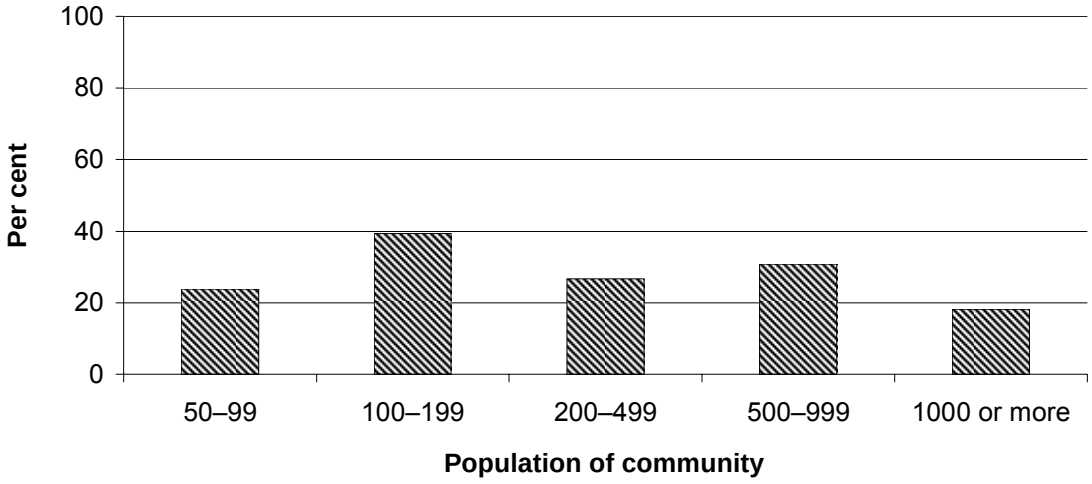
Data on testing of drinking water are included here as an indicator of the quality of water.

Most drinking water in Australia is regularly tested to measure its compliance with guidelines and standards, which have been established to ensure that drinking water is safe for human consumption.

Data on water testing and treatment in discrete Indigenous communities are only available for those communities that are not connected to a nearby mainstream town supply, and data were not collected in 'administered' communities with a population of fewer than 50.

The definition for the CHINS data item for water test failures does not specify whether one sample failed testing, all samples failed testing or whether water was outside the failure rates permitted by the various water quality guidelines. Therefore, results should be interpreted with caution.

Figure 10.2.3 **Testing of drinking water failed, in discrete Indigenous communities not connected to town supply, by reported usual population, 2006** [a, b]



[a] In the 12 months prior to the survey. [b] Excludes communities connected to town supply. Data not collected in 'administered' communities with a population of fewer than 50. Totals include 'not stated'.

Source: ABS 2006 CHINS, Cat. no. 4710.0; table 10A.2.3.

- In discrete Indigenous communities not connected to town supply, where water was sent away for testing in 2006, between 18.2 per cent and 39.4 per cent (depending on the size of the community) failed the testing (figure 10.2.3).
- In 2006, there were 194 Indigenous communities with populations of 50 or more that were not connected to a town water supply. Three-quarters of these (149 communities) had drinking water sent away for testing (table 10A.2.3).
- Of the 149 communities that had drinking water sent away for testing, 48 communities (28.8 per cent) failed the testing. These communities had a combined population of 12 059 people (table 10A.2.3).

Types of sewerage systems

In the 2006 CHINS, 25 discrete Indigenous communities reported having no organised sewerage system, an improvement from 91 communities in 2001 (table 10A.2.4). The total usual population of communities without organised sewerage facilities was 1 969 (ABS 2007).

Septic tanks, both with common effluent disposal and leach drains, and pit toilets continue to be the main sewerage systems in small communities. In discrete Indigenous communities, a total of 593, or half of the communities, reported the use of a septic system with a leach drain in 2006, and 202 communities reported using pit toilets. (table 10A.2.4).

Between 2001 and 2006, the number of communities connected to a nearby mainstream town system increased from 89 to 121 (from 7.3 per cent to 10.2 per cent of all communities) (table 10A.2.4). By 2006, a total population of 32 256 people in discrete Indigenous communities were connected to a mainstream town sewerage system (ABS 2007).

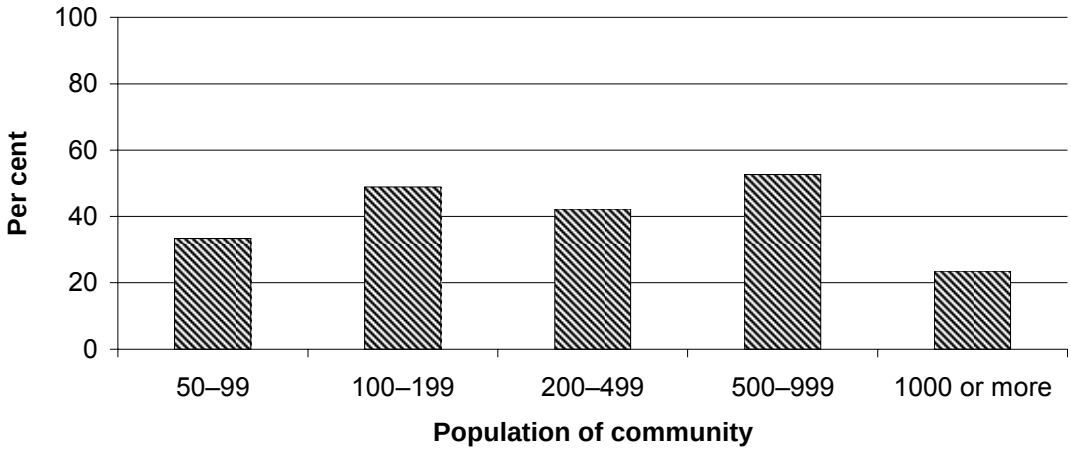
Numbers of community water-borne systems also increased slightly, with 108 communities reporting the use of such systems in 2006, compared to 96 in 2001 (table 10A.2.4). Community water-borne systems involve flush toilets and closed sewerage pipe systems using gravity and pumping stations to a common sewerage treatment plant (ABS 2007).

In communities with populations of 50 or more people, sewerage systems were reported to be connected to all permanent dwellings. A total of 192 small communities with a population of fewer than 50 people reported that a sewerage system was not connected to all permanent dwellings, of which 69 were located in Western Australia, 61 in the Northern Territory, 51 in Queensland and 10 in South Australia (ABS 2007).

Sewerage system overflows and leakages

Sewerage system leaks and overflows create potential health risks to people living in their vicinity and can also contaminate drinking water sources.

Figure 10.2.4 **Sewerage system overflows or leakages in discrete Indigenous communities, by usual population [a, b]**



a In the 12 months prior to the survey. **b** Data not collected in 'administered' communities with a population of less than 50.

Source: ABS 2006 CHINS, Cat. no. 4710.0; table 10A.2.5.

- Figure 10.2.4 shows that between 23.5 and 52.6 per cent of discrete Indigenous communities (depending on the size of the community) experienced sewerage overflows or leakages in the previous 12 months.
- In 2006, 130 of the 322 discrete Indigenous communities with a population of 50 or more (40.4 per cent) had experienced sewerage overflows or leakages in the previous 12 months (table 10A.2.5).
- In 2006, 142 communities reported sewerage overflows or leakages. Blocked drains (95 communities) and equipment failure (62 communities) accounted for the largest proportion of overflows and leakages. The total population in communities affected by sewerage overflows or leakages was 30 140 people (table 10A.2.5).
- Of the 142 communities that reported sewerage overflows or leakages, 31 (21.8 per cent) had experienced 10 or more overflows or leakages in the previous 12 months (table 10A.2.6).

Access to cooking, washing and toilet facilities

In 2006, 14 028 (89.6 per cent) of Indigenous Housing Organisation (IHO) managed permanent dwellings[3] had access to their own cooking, washing and toilet facilities (ABS 2007).

The proportion of IHO managed permanent dwellings that had access to their own cooking, washing and toilet facilities varied across remoteness areas. Non-remote areas had the highest proportion (94.6 per cent) of houses with access to these facilities, compared with 87.5 per cent in remote and 89.0 per cent in very remote areas (ABS 2007).

A total of 161 communities reported access to public toilet facilities within the community. Of these 125 communities (77.6 per cent) reported all toilets in working order (ABS 2007).

10.3 Overcrowding in housing

Box 10.3.1 **Key messages**

- In 2004-05, 25.0 per cent of Indigenous people aged 15 years and over lived in overcrowded housing (figure 10.3.1 and table 10A.3.3). There have been no statistically significant changes in the rates of overcrowding since 2002.
- In 2004-05, overcrowding was most common in very remote areas, where 63.4 per cent of Indigenous people lived in overcrowded households (figure 10.3.2).

Overcrowding places pressure on the household infrastructure that supports health (like septic tanks, sewerage pipes, washing machines, etc.), and can be a contributor to poor health, poor educational outcomes and family violence. A much higher proportion of Indigenous people live in overcrowded conditions than other Australians (SCRGSP 2003).

[3] ABS defines an 'IHO managed permanent dwelling' as: "Permanent dwellings located in discrete Indigenous communities, towns or other localities which are managed by an Indigenous organisation that provides housing to Aboriginal and Torres Strait Islander peoples. This includes permanent dwellings which are owned by State or Territory housing authorities, but managed by an Indigenous Housing Organisation (IHO). Excluded are dwellings in discrete Indigenous communities which are not managed by an IHO" (ABS 2007).

Reasons for overcrowding

There are cultural and social factors that influence the way housing is used in Indigenous communities. Household and community populations may fluctuate quite dramatically for social, cultural or seasonal reasons. Indigenous people are often mobile, and sharing homes with visiting relations and kin is common (ABS 2004). A 1993 study in the north west of South Australia found that some houses had relatively stable numbers of residents, while others had wide variations in numbers. The numbers in one house varied from zero to 32 at various times of the year (Pholeros, Rainow and Torzillo 1993). While such fluctuations may result in an overcrowded household, living in large family groupings is not always considered a problem; it can be the cultural norm (Keys Young 1998).

Taylor (2004), in a study of Wadeye and the Thamarrurr Regional Council area in the NT, reported both short-term and long-term variations in the numbers of people living in each house as people moved between houses, to and from outstations, and in and out of the region. There were seasonal movements of people from outstations into the Wadeye town during the wet season. The average number of people per house was 16, with one residence having an average occupancy of 22. Houses in the Thamarrurr region averaged three bedrooms each, giving an average occupancy rate of approximately five people per bedroom.

Overcrowding can also be due to inadequate, inappropriate or poorly maintained housing stock (DHAC 1999). In remote and very remote areas in particular, it is more expensive and logistically more difficult to construct and maintain infrastructure.

Data issues

Overcrowding data in this Report were derived using the Canadian National Occupancy Standard (box 10.3.2), which is the usual standard used by the ABS to measure overcrowding.

This occupancy standard was not developed specifically for Indigenous people. However, no housing occupancy standard can reflect the housing needs and preferences of all Indigenous people. For example, it does not account for the influence of climate and culture (in rural areas people may live outside houses rather than inside and the standard does not allow for verandahs or larger shared living spaces) (Pholeros, Rainow and Torzillo 1993). Indigenous cultures and lifestyles vary widely across Australia, as do climates. The occupancy standard used here will reflect the culture and preferences of some but not all Indigenous people.

The occupancy standard determines overcrowding by comparing the number of bedrooms with the number and characteristics of people in a dwelling. However, the numbers of bathrooms and toilets, and the size of kitchens, bedrooms and other living spaces may be as important as, or more important than, the number of bedrooms, particularly in larger households.

Box 10.3.2 **Housing occupancy standard used by ABS**

There is no single standard measure for housing overcrowding. The ABS uses a standard[a] which is sensitive to both household size and composition. Where this standard cannot be met, households are considered to be overcrowded.

The following criteria were used to assess bedroom requirements:

- there should be no more than two persons per bedroom
- a household of one unattached individual may reasonably occupy a bed-sit (that is, have no bedroom)
- couples and parents should have a separate bedroom
- children less than five years of age of different sexes may reasonably share a bedroom
- children five years of age or over of the opposite sex should not share a bedroom
- children less than 18 years of age and of the same sex may reasonably share a bedroom
- single household members aged 18 years or over should have a separate bedroom.

[a] Based on the Canadian National Occupancy Standard for housing appropriateness.

Source: ABS (2004).

The quality and condition of housing also influence health outcomes. If a house has sufficient working taps, tubs, showers, toilets, insect screens and protection from the weather it will be much better able to prevent the disease transmission that can occur in crowded households.

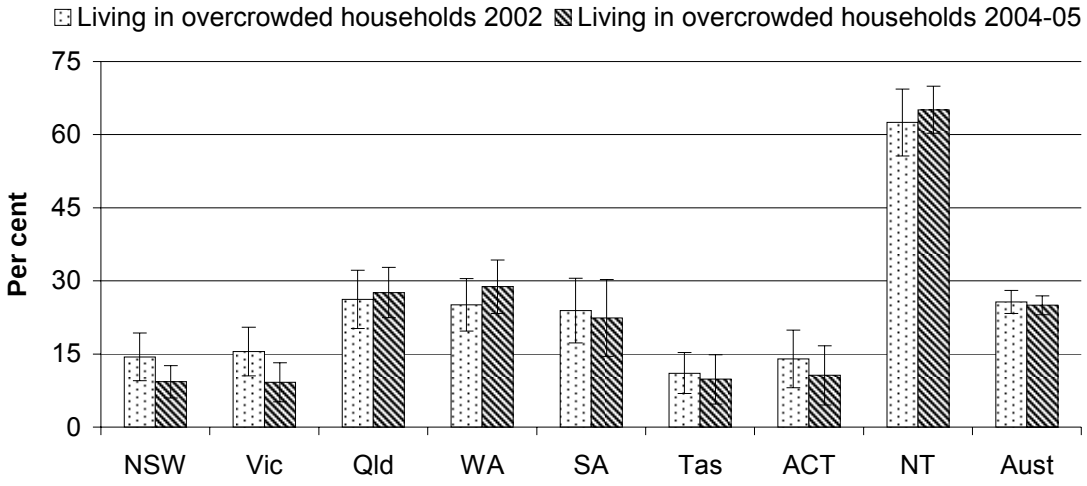
Overcrowding in housing is reported here using data from the ABS National Aboriginal and Torres Strait Islander Social Survey 2002 (NATSISS), the ABS National Aboriginal and Torres Strait Islander Health Survey 2004-05 (NATSIHS). Data on the rates of overcrowding experienced by non-Indigenous people were not available for this Report.

The NATSISS only reported data for those aged 15 years and older, whereas the NATSIHS collected data for children as well. Consequently, data presented as a time series between 2002 and 2004-05 cover only people aged 15 years and over, whereas data presented for 2004-05 alone, cover all age groups.

This Report also includes data on Indigenous peoples' reporting of overcrowding as a 'stressor'. These data come from the 2002 NATSISS and the 2004-05 NATSIHS and cover Indigenous people 18 years and older. As discussed above, there are social and cultural aspects to consider when defining 'overcrowding'. The data on stressors may better present Indigenous peoples' perceptions of overcrowding.

All data presented are based on the number of residents in households with at least one Indigenous person. A household with one or more Indigenous persons may also contain non-Indigenous people. Therefore, data reported for the proportion of people in overcrowded households may reflect the presence of some non-Indigenous people who were living in households with Indigenous people.

Figure 10.3.1 **Proportion of Indigenous people 15 years and over living in overcrowded housing, by State/Territory, 2002 and 2004-05[a, b]**



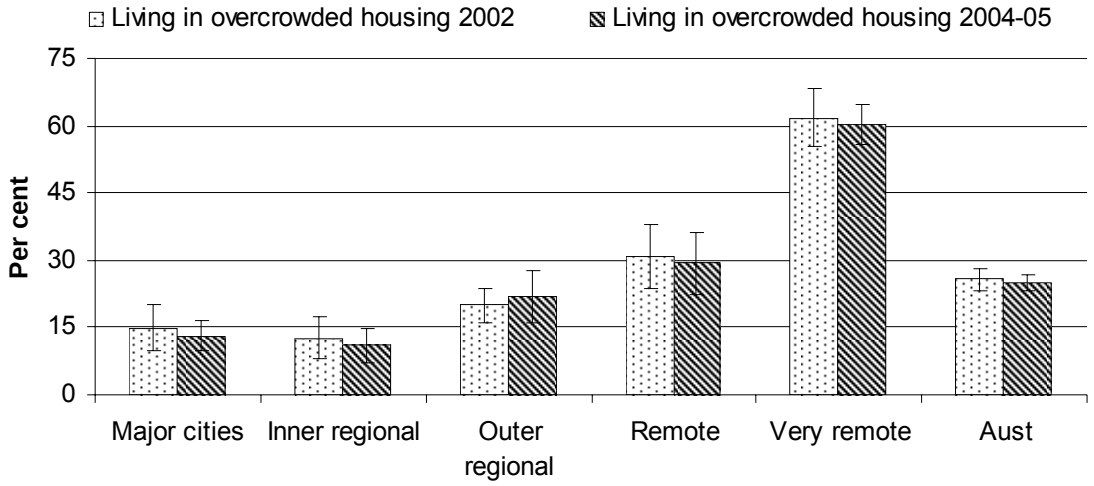
a Based on the Canadian National Occupancy Standard for housing appropriateness. **b** Error bars represent 95 per cent confidence intervals around each estimate (see chapter 2 for more information).

Source: ABS 2002 NATSISS; ABS 2004-05 NATSIHS; table 10A.3.3.

- Figure 10.3.1 shows that in 2004-05, 25.0 per cent of Indigenous people 15 years and over in Australia lived in overcrowded houses.
- In 2004-05, an estimated 128 300 Indigenous people of all ages (27.0 per cent) lived in overcrowded housing in Australia (table 10A.3.1).
- The proportion of Indigenous people living in overcrowded housing varied between states and territories (table 10A.3.3).
- Between 2002 and 2004-2005, there were no significant differences in the rates of overcrowding for Indigenous people aged 15 years and over at the State and Territory or national levels.

- There were no statistically significant differences in overcrowding rates between Torres Strait Islander people and Aboriginal people in 2004-05 (tables 10A.3.1–10A.3.4).

Figure 10.3.2 **Proportion of Indigenous people 15 years and over living in overcrowded housing, by remoteness area, 2002 and 2004-05[a, b]**

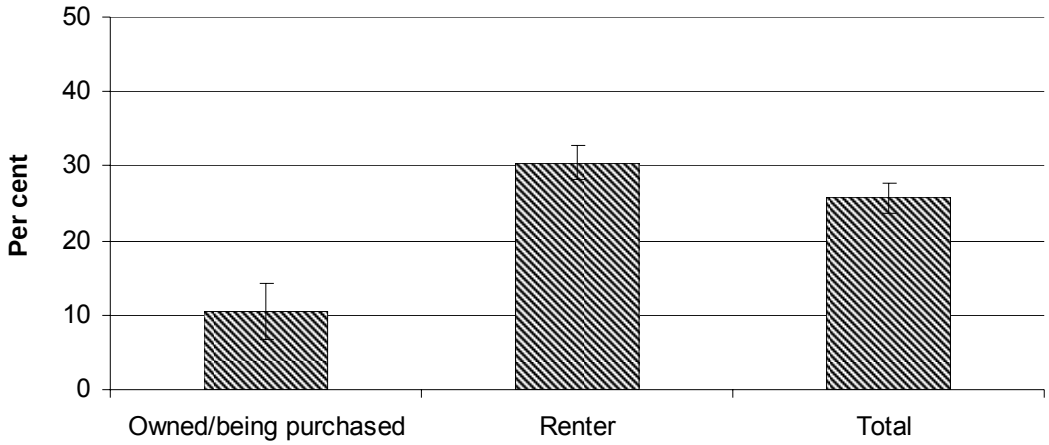


a Based on the Canadian National Occupancy Standard for housing appropriateness. **b** Error bars represent 95 per cent confidence intervals around each estimate (see chapter 2 for more information).

Source: ABS 2002 NATSISS; ABS 2004-05 NATSIHS; tables 10A.3.2.

- Figure 10.3.2 shows that, between 2002 and 2004-05, there were no significant changes in the proportions of Indigenous people aged 15 years and over living in overcrowded households.
- Very remote and remote areas have the highest incidence of overcrowding. In 2004-05, 30.8 per cent of Indigenous people aged 15 years and over in remote areas lived in overcrowded households. In very remote areas, 60.4 per cent of Indigenous people aged 15 years and over lived in overcrowded households. Including children aged 0–14, the proportion in very remote areas was higher still (63.4 per cent) (table 10A.3.2).
- In major cities and regional areas, the incidence of overcrowding for Indigenous people aged 15 years and over ranged from 11.0 per cent (inner regional areas) to 21.9 per cent (outer regional areas) in 2004-05.

Figure 10.3.3 **Proportion of Indigenous people aged 15 years or over living in overcrowded housing, by housing tenure, 2004-05** [a, b, c]

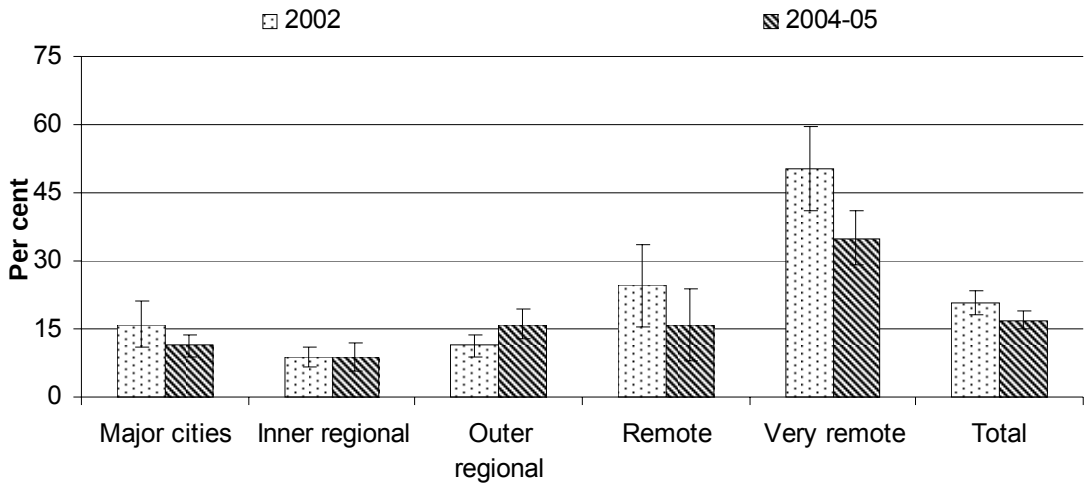


[a] Based on the Canadian National Occupancy Standard for housing appropriateness. [b] 'Owned/being purchased' includes being purchased under a rent/buy scheme. [c] Error bars represent 95 per cent confidence intervals around each estimate (see chapter 2 for more information).

Source: ABS 2004-05 NATSIHS; table 10A.3.4.

- Figure 10.3.3 shows that in 2004-05, the proportion of Indigenous people 15 years and over living in overcrowded housing varied significantly by housing tenure. Those in rental accommodation were significantly more likely to live in overcrowded households than those in homes which were 'owned or being purchased' (30.4 per cent compared with 10.4 per cent).
- In 2004-05, the majority Indigenous people who lived in overcrowded housing, lived in rented accommodation (63 900 out of a national estimate of 73 400) (table 10A.3.4).

Figure 10.3.4 **Proportion of Indigenous people 18 years and over who reported overcrowding as a stressor in the last 12 months, by remoteness area, 2002 and 2004-05[a]**



a Error bars represent 95 per cent confidence intervals around each estimate (see chapter 2 for more information).

Source: ABS 2002 NATSISS; ABS 2004-05 NATSIHS; table 10A.3.5.

- Figure 10.3.4 shows that the proportion of Indigenous adults reporting overcrowding as a stressor varied according to geographic remoteness. Indigenous adults in very remote areas were most likely to report this stressor (50.2 per cent in 2002 and 35.0 per cent in 2004-05) while those in inner regional areas were least likely to report it (around 9 per cent in both years).

10.4 Future directions in data

Rates of diseases associated with poor environmental health

The ABS is working with states and territories to improve the quality of Indigenous mortality data, while the AIHW is working with states and territories to improve data on Indigenous hospitalisations. See chapter 2 and appendix 4 for more information.

Access to clean water and functional sewerage

During 2001-02, the Bureau of Rural Sciences undertook an audit of the current status of the potable water supplies in rural and remote communities across Australia. For many of these communities, including the 348 Indigenous

communities identified in the audit, there were no data available regarding water quality and water quality testing regimes. It would be useful if this audit could be undertaken again, to provide a more accurate picture of the water quality in rural, remote and Indigenous communities.

The AIHW is developing a National Reporting Framework for Indigenous Housing, which aims to provide comparable administrative data on indicators such as the proportion of communities and dwellings not connected to water, sewerage and electricity, and the proportion of dwellings meeting the nine Fixing Houses for Better Health healthy living standards.

Overcrowding in housing

Direct comparisons of overcrowding between Indigenous and non-Indigenous people could not be derived from the results of the ABS National Health Survey 2004-05. The 2006 Census will provide a comparable data source on overcrowding for future Reports, and will be available in 2007.

10.5 Attachment tables

Attachment tables are identified in references throughout this chapter by an 'A' suffix (for example, table 10A.3.3 is table 3 in the attachment tables for section 10.3). The files containing the attachment tables can also be found on the Review web page (www.pc.gov.au/gsp). Users without access to the Internet can contact the Secretariat to obtain the attachment tables (see contact details on the inside front cover of the Report).

10.1 Rates of diseases associated with poor environmental health

Table 10A.1.1	Hospitalisation rates on selected types of environmentally based diseases (per 10 000 population), age standardised, by gender, age and Indigenous status, Qld, WA, SA, and public hospitals in NT 2004-05
Table 10A.1.2	Hospitalisation rates on selected types of environmentally based diseases (per 10 000 population), age standardised, by gender, age and Indigenous status, Qld, WA, SA, and public hospitals in the NT, 2001–2004
Table 10A.1.3	Hospitalisation rates on selected types of environmentally based diseases (per 10 000 population), by gender, age and Indigenous status 2001–2005, Qld, WA, SA, and public hospitals in NT
Table 10A.1.4	Deaths from diseases associated with poor environmental health (per 100 000 population), age standardised, 2001-2005

10.2 Access to clean water and functional sewerage

Table 10A.2.1	Main source of drinking water, discrete Indigenous communities, by remoteness area, 2001, 2006
Table 10A.2.2	Water restrictions and interruptions, in discrete Indigenous communities, by reported usual population 2006
Table 10A.2.3	Testing of drinking water in discrete Indigenous communities, by reported usual population, 2006
Table 10A.2.4	Type of sewerage systems in discrete Indigenous communities, by remoteness area, 2001, 2006
Table 10A.2.5	Sewerage system overflows or leakages in discrete Indigenous communities, by usual population, 2006
Table 10A.2.6	Frequency of sewerage system overflows or leakages in discrete Indigenous communities, by State and Territory, 2006

10.3 Overcrowding in housing

Table 10A.3.1	Persons living in overcrowded households, by Indigenous status, 2002, 2004-05
Table 10A.3.2	Indigenous people living in overcrowded households, by remoteness, 2004-05
Table 10A.3.3	Indigenous people: living in overcrowded households, by State and Territory, 2004-05
Table 10A.3.4	Indigenous people aged 15 years or over: living in overcrowded households, by tenure and landlord type, 2004-05
Table 10A.3.5	Indigenous people 18 years and over who reported overcrowding as a stressor in the last 12 months, by Remoteness Areas, 2002 and 2004-05

10.6 References

10 Effective environmental health systems

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