1.04 Hospitalisation for pneumonia

The number of hospital separations with a principal diagnosis of pneumonia for Aboriginal and Torres Strait Islander people expressed as a rate by age group, age-standardised rate and ratio

Data sources

Data for this measure come from the AIHW's National Hospital Morbidity Database.

The National Hospital Morbidity Database is a compilation of episode-level records from admitted patient morbidity data collection systems in Australian hospitals in each state and territory. Information on the characteristics, diagnoses and care of admitted patients in public and private hospitals is provided annually to the AIHW by state and territory health departments.

Data are presented for the four jurisdictions which have been assessed as having adequate identification of Indigenous hospitalisations in 2003–04—Queensland, Western Australia, South Australia and the Northern Territory (AIHW 2005). These four jurisdictions represent approximately 60% of the Indigenous population of Australia. Data are presented by state/territory of usual residence of the patient.

Hospitalisations for which the Indigenous status of the patient was not reported have been included with hospitalisations data for non-Indigenous people under the 'other' category. This is to enable consistency across jurisdictions as public hospitals in some states and territories do not have a category for the reporting of 'not stated' or inadequately recorded/reported Indigenous status.

Hospitalisation data are presented for the two-year period July 2002 to June 2004. An aggregate of two years of data has been used, as the number of hospitalisations for some conditions is likely to be small for a single year.

The principal diagnosis is the diagnosis established to be the problem that was chiefly responsible for the patient's episode of care in hospital. The additional diagnosis is a condition or complaint either coexisting with the principal diagnosis or arising during the episode of care. The term 'hospitalisation' has been used to refer to a separation which is the episode of admitted patient care, which can be a total hospital stay (from admission to discharge, transfer or death) or a change in a type of care (for example, from acute to rehabilitation).

Analyses

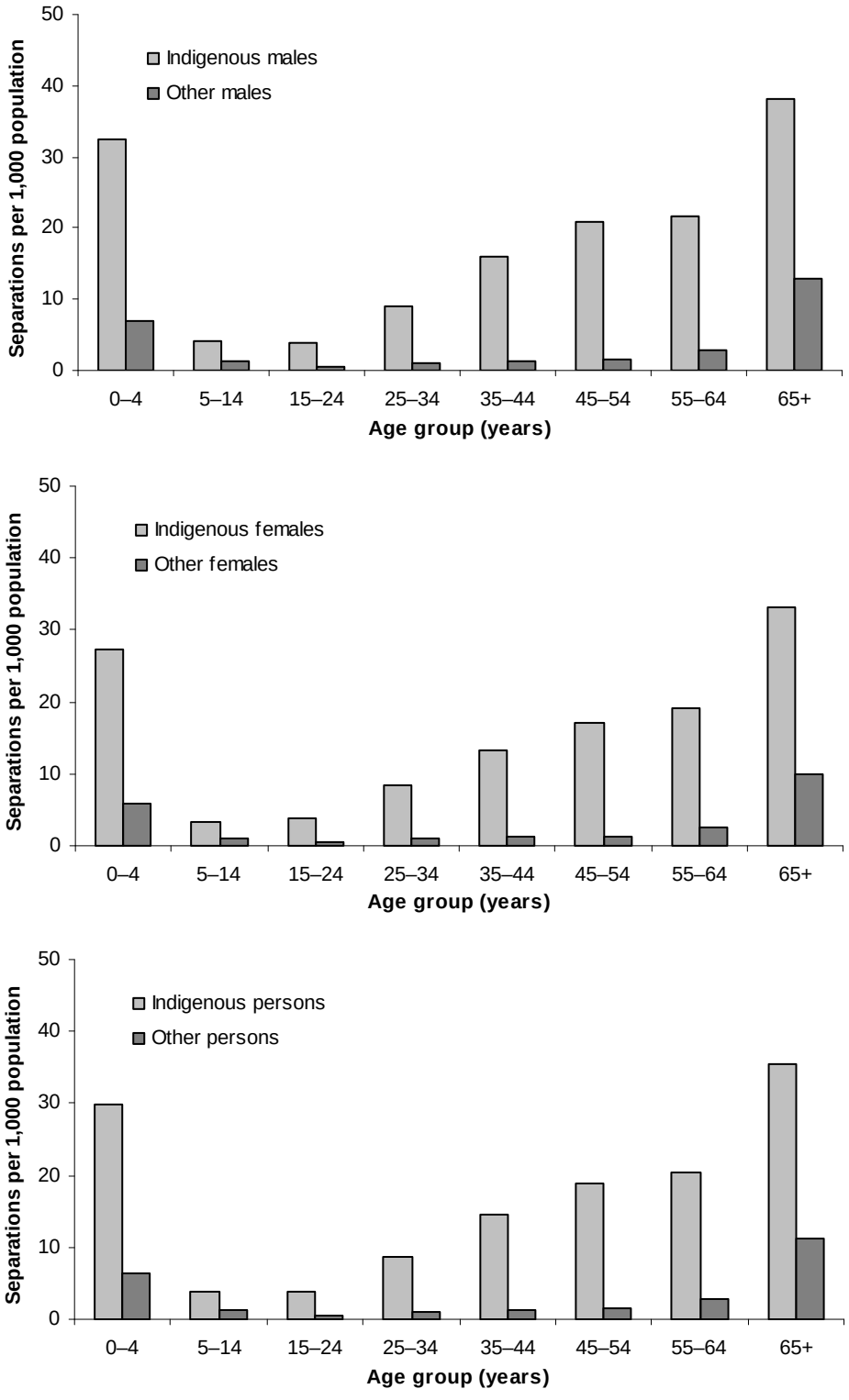
Age-standardised rates and ratios have been used for this indicator as a measure of hospitalisations in the Indigenous population relative to other Australians. Ratios of this type illustrate differences between the rates of hospital admissions among Indigenous people and those of other Australians, taking into account differences in age distributions.

Hospitalisations

- In the two-year period July 2002 to June 2004, there were 47,870 hospitalisations for pneumonia in Queensland, Western Australia, South Australia and the Northern Territory combined, 6,802 (14%) of which were hospitalisations of Aboriginal and Torres Strait Islander peoples (Table 1.04.1).
- Hospitalisations for pneumonia represented 2.2% of all hospital separations for Aboriginal and Torres Strait Islander Australians.

Hospitalisations by age and sex

- In the two-year period July 2002 to June 2004, in Queensland, Western Australia, South Australia and the Northern Territory combined, Indigenous males and females had higher hospitalisation rates for pneumonia than other males and females across all age groups (Figure 1.04.1).
- The greatest difference in rates occurred in the 35–44 and 45–54 year age groups where Indigenous males and females were hospitalised at around 12–14 times the rate of other Australians.
- For both Indigenous and other Australian males and females, hospitalisation rates were highest among those aged 0–4 years and 65 years and over.
- Approximately 52% of Indigenous Australians hospitalised for pneumonia were males (3,269) and 48% were females (3,233).



Source: AIHW analysis of AIHW National Hospital Morbidity Database.

Figure 1.04.1: Age-specific hospitalisation rates for a principal diagnosis of pneumonia, by Indigenous status and sex, Qld, WA, SA and NT, July 2002–June 2004

Hospitalisations by state/territory

Table 1.04.1 presents hospitalisations for a principal diagnosis of pneumonia for the two-year period July 2002 to June 2004 for Queensland, Western Australia, South Australia and the Northern Territory.

- In the Northern Territory, Indigenous Australians were nine times more likely to be hospitalised for pneumonia than other Australians. In Western Australia, Indigenous Australians were eight times more likely to be hospitalised for pneumonia than other Australians. In South Australia and Queensland, Indigenous Australians were hospitalised for pneumonia at five and three times the rate of other Australians respectively.
- In Queensland, Western Australia, South Australia and the Northern Territory combined, Indigenous Australians were hospitalised for pneumonia at six times the rate of other Australians.

Table 1.04.1: Hospitalisations for principal diagnosis of pneumonia, by Indigenous status and sex, Qld, WA, SA and NT, July 2002–June 2004[(a)(b)(c)(d)]

	Indigenous				Other[(e)]				
	Number	Rate per 1,000[(f)]	LCL 95%[(g)]	UCL 95%[(h)]	Number	Rate per 1,000[(f)]	LCL 95%[(g)]	UCL 95%[(h)]	Ratio[(i)]
Qld									
Males	954	11.1	10.1	12.2	11,106	3.3	3.2	3.3	3.4*
Females	837	8.9	8.1	9.7	10,256	2.7	2.6	2.7	3.3*
Persons	1,791	9.9	9.2	10.5	21,362	2.9	2.9	3.0	3.3*
WA									
Males	1,040	20.7	19.0	22.5	4,675	2.8	2.7	2.9	7.4*
Females	963	18.0	16.6	19.5	4,242	2.2	2.1	2.3	8.2*
Persons	2,003	19.3	18.2	20.4	8,917	2.5	2.4	2.5	7.8*
SA									
Males	273	14.0	11.6	16.4	5,463	3.6	3.5	3.7	3.9*
Females	282	14.4	12.2	16.5	4,748	2.7	2.6	2.8	5.4*
Persons	555	14.2	12.6	15.8	10,211	3.1	3.0	3.1	4.6*
NT									
Males	1,302	27.0	24.9	29.2	332	3.1	2.7	3.5	8.8*
Females	1,151	23.1	21.4	24.8	246	2.7	2.3	3.1	8.5*
Persons	2,453	24.9	23.6	26.2	578	2.9	2.6	3.2	8.6*
Qld, WA, SA and NT[(d)]									
Males	3,569	17.0	16.2	17.8	21,576	3.2	3.2	3.3	5.3*
Females	3,233	14.5	13.9	15.2	19,492	2.6	2.5	2.6	5.7*
Persons	6,802	15.7	15.2	16.2	41,068	2.9	2.8	2.9	5.5*

* Represents results with statistically significant differences in the Indigenous/other comparisons at the p<.05 level.

(a) Data are from public and most private hospitals. Data exclude private hospitals from the Northern Territory.

(b) Categories are based on the ICD10-AM (National Centre for Classification in Health 2004); ICD-10-AM codes J12–J18.

(c) Financial year reporting.

(d) Data are reported by state/territory of usual residence of the patient hospitalised and are for Western Australia, South Australia, the Northern Territory and Queensland only. These four jurisdictions are considered to have adequate levels of Indigenous identification, although the level of accuracy varies by jurisdiction and hospital. Data for these four jurisdictions over-represent Indigenous populations in less urbanised and more remote locations. Hospitalisation data for four jurisdictions should not be assumed to represent the hospitalisation experience in the other jurisdictions.

(e) Other includes hospitalisations of non-Indigenous people and those for whom Indigenous status was 'not stated'.

(f) Directly age standardised using the Australian 2001 Standard population.

(g) LCL = lower confidence limit.

(h) UCL = upper confidence limit.

(i) Rate ratio Indigenous:other.

Source: AIHW analysis of AIHW National Hospital Morbidity Database.

Time series analysis

All ages

Hospitalisation rates, rate ratios and rate differences between Indigenous and other Australians for pneumonia over the five-year period 1998–99 to 2003–04 are presented in Table 1.04.2 and Figure 1.04.2.

- In Queensland, Western Australia, South Australia and the Northern Territory, there were apparent declines in hospitalisation rates for pneumonia among Indigenous males, females and persons during the period 1998–99 to 2003–04, however, the declines were only significant for Indigenous males.
- There were no significant changes in hospitalisation rates among other Australian males, females and persons over the same period.
- There were also significant declines in the hospitalisation rate ratios and rate differences between Indigenous and other Australians for pneumonia. The fitted trend implies an average yearly decline of 0.1 in the rate ratio and 0.4 per 1,000 in the rate difference for the period 1998–99 to 2003–04. This reflects a relative and absolute decrease in the gap between the hospitalisation rates for Indigenous and other Australians for pneumonia.

Children aged 0–4 years

Hospitalisation rates, rate ratios and rate differences between Indigenous and other children aged 0–4 years for pneumonia over the five-year period 1998–99 to 2003–04 are presented in Table 1.04.3 and Figure 1.04.3.

- In Queensland, Western Australia, South Australia and the Northern Territory, there were significant declines in hospitalisation rates for pneumonia among Indigenous children aged 0–4 years during the period 1998–99 to 2003–04. The fitted trend implies an average yearly decline in the rate of around 2 per 1,000.
- Over the same period, there were significant increases in the hospitalisation rates among other children aged 0–4 years for pneumonia.
- There were significant declines in both the hospitalisation rate ratios and rate differences between Indigenous and other children for pneumonia. The fitted trend implies an average yearly decline of around 0.5 in the rate ratio and 2.3 per 1,000 in the rate difference for the period 1998–99 to 2003–04. This reflects a relative and absolute decline in the gap in hospitalisation rates for pneumonia among Indigenous and other Australian children aged 0–4 years over the period.

It should be noted that changes in the level of accuracy of Indigenous identification in hospital records will result in changes in the level of reported hospital separations for Indigenous Australians. Also, changes in access, hospital policies and practices all impact on the level of hospitalisation over time. Caution should be used in interpreting changes over time as it is not possible to ascertain whether a change in reported hospitalisation is due to changes in the accuracy of Indigenous identification or real changes in the rates at which Indigenous people are hospitalised. An increase in hospitalisation rates may reflect better hospital access rather than a worsening of health.

Table 1.04.2: Age-standardised hospitalisation rates, rate ratios and rate differences from pneumonia, Qld, WA, SA and NT, 1998–99 to 2003–04

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	Annual change[a]
Indigenous rate per 1,000							
Males	20.0	18.6	17.0	17.2	17.0	17.0	−0.6*
Females	15.6	14.7	14.3	12.5	14.6	14.5	−0.2
Persons	17.6	16.5	15.6	14.7	15.7	15.7	−0.4
Other Australian[b] rate per 1,000							
Males	3.5	3.3	3.1	3.3	3.3	3.2	—
Females	2.5	2.4	2.3	2.6	2.5	2.6	—
Persons	2.9	2.8	2.7	2.9	2.9	2.9	—
Rate ratio[c]							
Males	5.7	5.7	5.5	5.2	5.2	5.3	−0.1*
Females	5.3	5.3	5.3	4.3	5.1	5.0	−0.1
Persons	6.0	6.0	5.8	5.1	5.5	5.5	−0.1*
Rate difference[d]							
Males	16.5	15.4	13.9	13.9	13.7	13.8	−0.5*
Females	12.7	11.9	11.6	9.7	11.7	11.6	−0.2
Persons	14.7	13.7	12.9	11.8	12.8	12.8	−0.4*

* Represents results with statistically significant increases or declines at the p<.05 level over the period 1998–99 to 2003–04.

(a) Average annual change in rates, rate ratios and rate differences determined using linear regression analysis.

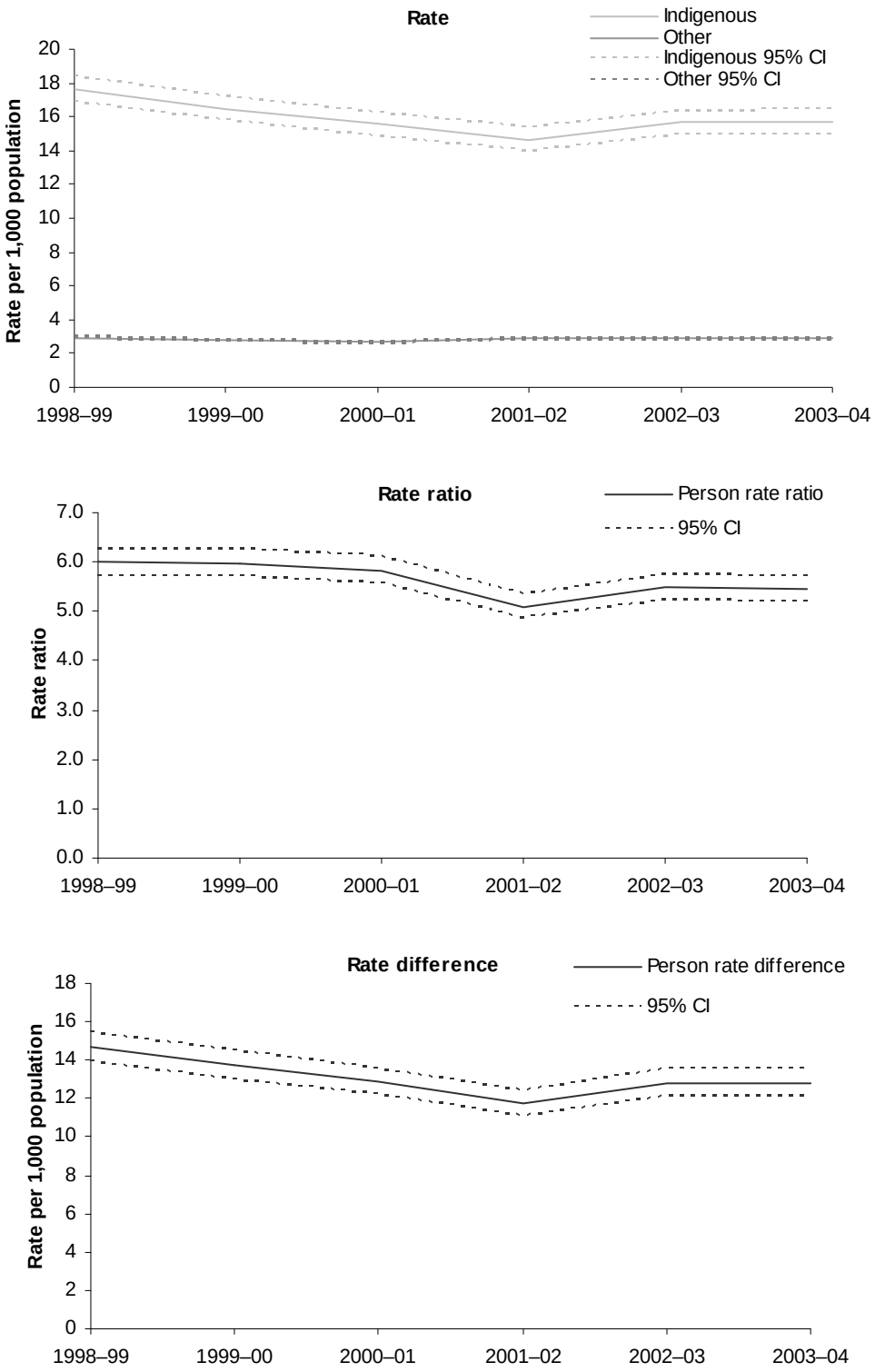
(b) 'Other' includes hospitalisations of non-Indigenous people and those for whom Indigenous status was not stated.

(c) Hospitalisation rates for Indigenous Australians divided by the hospitalisation rates for other Australians.

(d) Hospitalisation rates for Indigenous Australians minus the hospitalisation rates for other Australians.

Note: Rates have been directly age standardised using the 2001 Australian standard population.

Source: AIHW analysis of AIHW National Hospital Morbidity Database.



Source: AIHW analysis of AIHW National Hospital Morbidity Database.

Figure 1.04.2: Hospitalisation rates, rate ratios and rate differences between Indigenous and other Australians from pneumonia, Qld, WA, SA and NT, 1998–99 to 2003–04

Table 1.04.3: Children aged 0–4 years, hospitalisation rates, rate ratios and rate differences from pneumonia, Qld, WA, SA and NT, 1998–99 to 2003–04

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	Annual change[(a)]
Indigenous rate per 1,000							
Persons	40.1	36.5	34.8	31.8	30.3	29.6	−2.1*
Other Australian[(b)] rate per 1,000							
Persons	5.5	5.8	6.2	6.3	6.3	6.4	0.2*
Rate ratio[(c)]							
Persons	7.2	6.3	5.6	5.1	4.8	4.6	−0.5*
Rate difference[(d)]							
Persons	34.5	30.8	28.6	25.5	24.0	23.2	−2.3*

* Represents results with statistically significant increases or declines at the p<.05 level over the period 1998–99 to 2003–04.

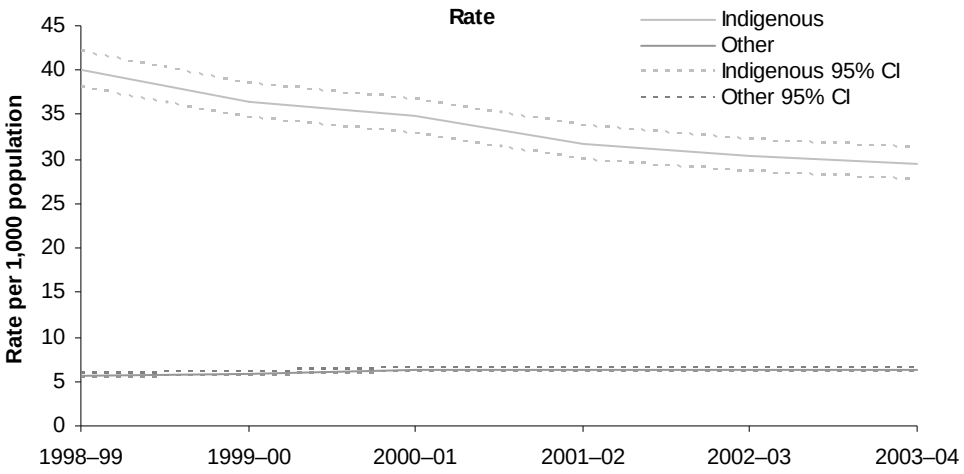
(a) Average annual change in rates, rate ratios and rate differences determined using linear regression analysis.

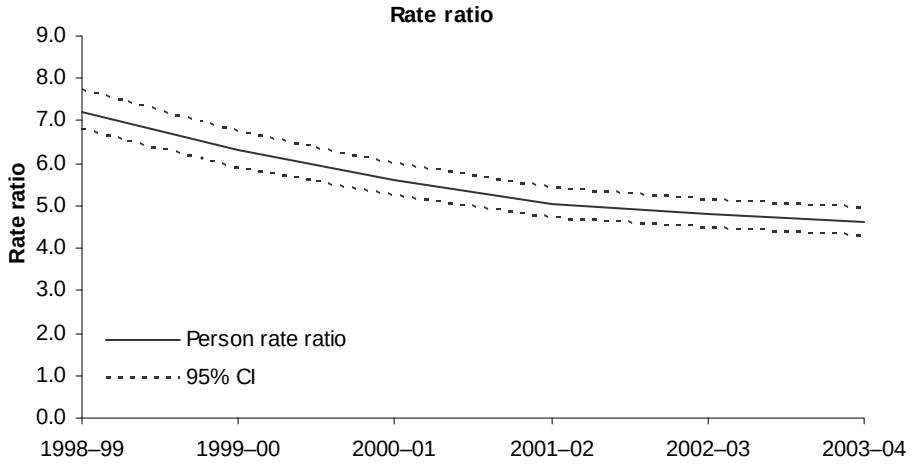
(b) 'Other' includes hospitalisations of non-Indigenous people and those for whom Indigenous status was not stated.

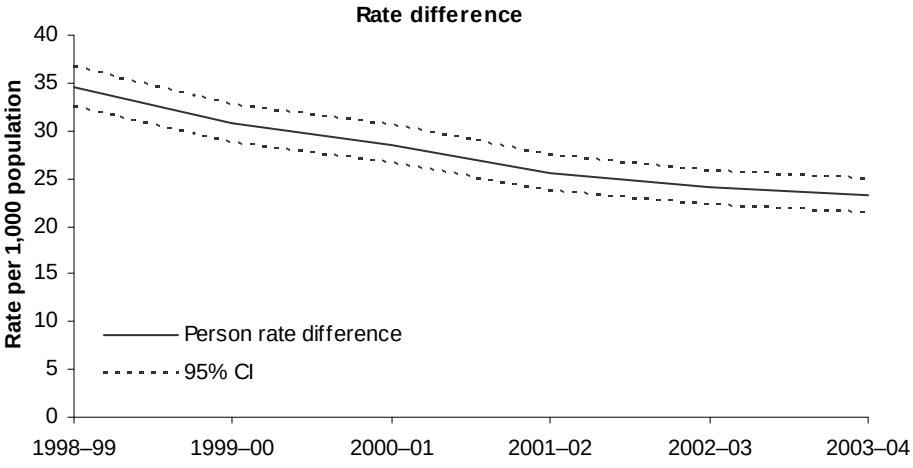
(c) Hospitalisation rates for Indigenous Australians divided by the hospitalisation rates for other Australians.

(d) Hospitalisation rates for Indigenous Australians minus the hospitalisation rates for other Australians.

Source: AIHW analysis of AIHW National Hospital Morbidity Database.







Source: AIHW analysis of AIHW National Hospital Morbidity Database.

Figure 1.04.3: Children aged 0–4 years, hospitalisation rates, rate ratios and rate differences between Indigenous and other Australians from pneumonia, Qld, WA, SA and NT, 1998–99 to 2003–04

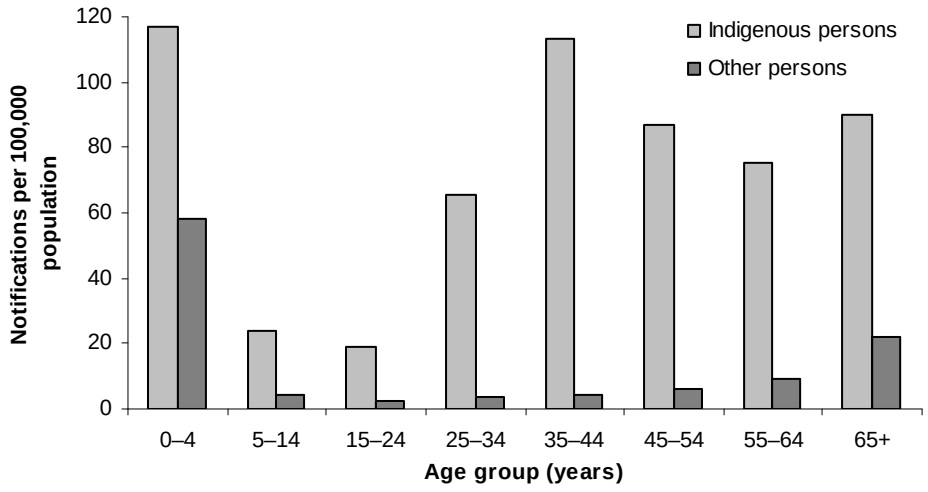
Additional information

Invasive pneumococcal disease

Pneumococcal disease is caused by the bacterium Streptococcus pneumoniae and can cause infection in parts of the respiratory tract (otitis media, sinusitis, pneumonia) or enter the bloodstream. Manifestations include meningitis, pneumonia and septicaemia. Invasive pneumococcal disease is defined as a sterile site isolate of Streptococcus pneumoniae, usually from blood (Menzies et al.2004).

Incidence

For the period 2002–2004, there were 283 invasive pneumococcal disease notifications among Indigenous persons in Western Australia, South Australia and the Northern Territory. The notification rate for Indigenous persons was 56.2 per 100,000 which was almost six times the rate for other persons (10.2 per 100,000). Notification rates were highest among those aged 0–4 years and 35–44 years for Indigenous Australians, and highest among those aged 0–4 years and 65 years and over for other Australians. For all age groups, Indigenous Australians had higher notification rates than other Australians. Rate differences were highest among the 25–34 and 35–44 year age groups, where Indigenous Australians suffered from invasive pneumococcal disease at between 19 and 28 times the rate of other Australians. Importantly, the notification rate among Aboriginal and Torres Strait Islander people was significantly higher at younger ages than for other Australians. For example, the rate among those aged 5–14 years was equivalent to the rate seen among other Australians aged 65 years and over (Figure 1.04.4).



Source: AIHW analysis of National Notifiable Disease Surveillance System, DoHA.

Figure 1.04.4: Invasive pneumococcal disease notification rate, by age group and Indigenous status, WA, SA and NT, 2002–2004

Hospitalisations

Over the period June 2002 to July 2004, there were 72 hospitalisations of Indigenous people in Queensland, Western Australia, South Australia and the Northern Territory combined for invasive pneumococcal disease. Over one-third of these hospitalisations were among those aged 0–4 years (35%).

- Hospitalisation rates, rate ratios and rate differences between Indigenous and other children aged 0–4 years for invasive pneumococcal disease over the five-year period 1998–99 to 2003–04 are shown in Table 1.04.4 and Figure 1.04.5 below.
- In Queensland, Western Australia, South Australia and the Northern Territory combined, there were significant declines in hospitalisation rates for invasive pneumococcal disease among Indigenous children aged 0–4 years during the period 1998–99 to 2003–04. The fitted trend implies an average yearly decline in the rate of around 0.1 per 1,000.
- Over the same period, there was no significant change in the hospitalisation rate for invasive pneumococcal disease among other children aged 0–4 years.
- There were significant declines in both the hospitalisation rate ratios and rate differences between Indigenous and other children for invasive pneumococcal disease. The fitted trend implies an average yearly decline of around 0.7 in the rate ratio and 0.1 per 1,000 in the rate difference for the period 1998–99 to 2003–04. This reflects a relative and absolute decline in the gap between hospitalisation rates for invasive pneumococcal disease among Indigenous and other Australians aged 0–4 years over the period.

Table 1.04.4: Children aged 0–4 years, hospitalisation rates, rate ratios and rate differences from invasive pneumococcal disease, Qld, WA, SA and NT, 1998–99 to 2003–04

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	Annual change[(a)]
Indigenous rate per 1,000							
Persons	0.6	0.6	0.4	0.2	0.4	0.3	−0.1*
Other Australian[(b)] rate per 1,000							
Persons	0.1	0.2	0.2	0.3	0.2	0.2	0.01
Rate ratio[(c)]							
Persons	5.9	2.9	1.6	0.7	1.8	1.6	−0.7*
Rate difference[(d)]							
Persons	0.5	0.4	0.1	-0.1	0.2	0.1	−0.1*

* Represents results with statistically significant increases or declines at the p<.05 level over the period 1998–99 to 2003–04.

(a) Average annual change in rates, rate ratios and rate differences determined using linear regression analysis.

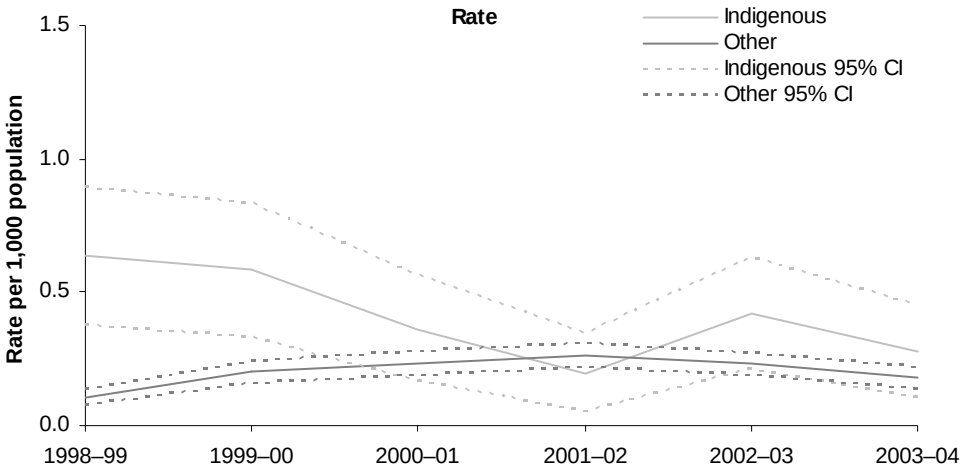
(b) 'Other' includes hospitalisations of non-Indigenous people and those for whom Indigenous status was not stated.

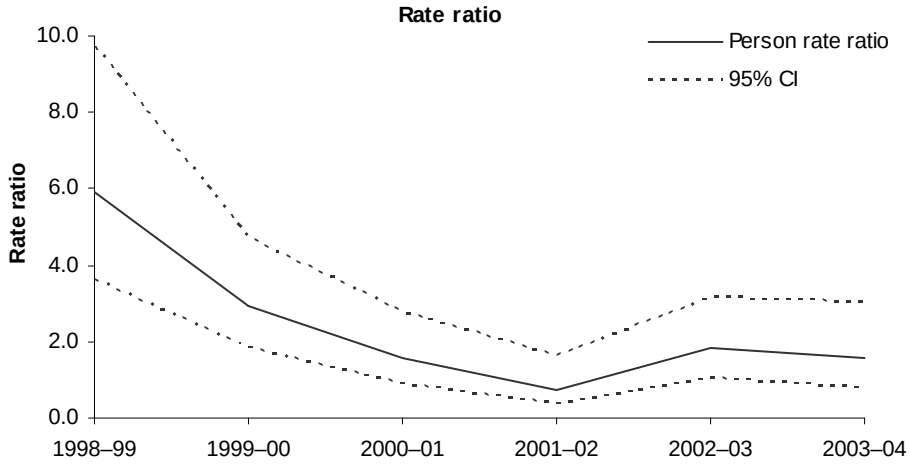
(c) Hospitalisation rates for Indigenous Australians divided by the hospitalisation rates for other Australians.

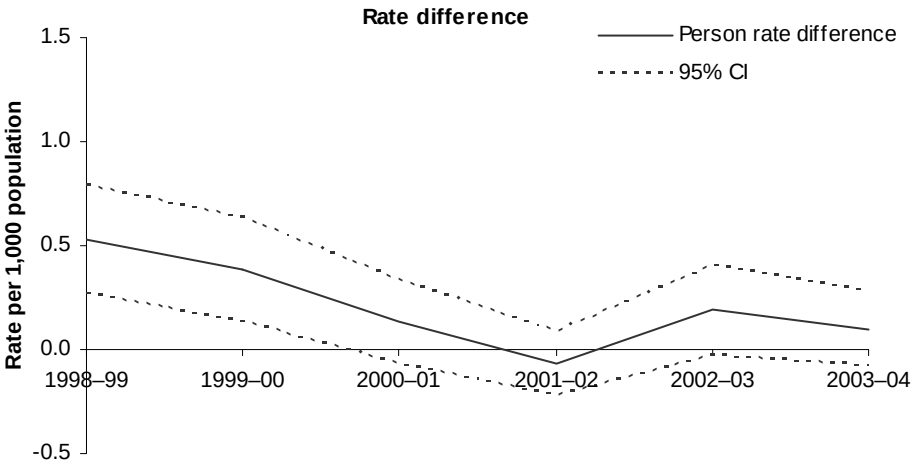
(d) Hospitalisation rates for Indigenous Australians minus the hospitalisation rates for other Australians.

Note: Hospitalisations for pneumococcal meningitis (G00.1) and pneumococcal septicaemia (A40.3) have been used as a proxy for invasive pneumococcal disease.

Source: AIHW analysis of AIHW National Hospital Morbidity Database.







Source: **AIHW analysis of AIHW National Hospital Morbidity database.**

Figure 1.04.5: Children aged 0–4 years, hospitalisation rates, rate ratios and rate differences between Indigenous and other Australians from invasive pneumococcal disease, Qld, WA, SA and NT, 1998–99 to 2003–04

Immunisation

A recent report from the National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases found that among adults aged 50–64 years, coverage for pneumococcal vaccine was higher for Indigenous Australians than for other Australians (20% compared with 3% respectively) (Menzies et al. 2004). Indigenous adults in remote area had higher vaccination coverage rates for this disease than in non-remote areas. Pneumococcal vaccinations are likely to be higher for Indigenous adults than other adults as these have been funded for Indigenous people since 1999.

Data quality issues

Hospital separations data

Separations

The number and pattern of hospitalisations can be affected by differing admission practices among the jurisdictions and from year to year, and differing levels and patterns of service delivery.

Indigenous status question

Some jurisdictions have slightly different approaches to the collection and storage of the standard Indigenous status question and categories in their hospital collections. The not stated category is missing from several collections. It is recommended that the standard wording and categories be used in all jurisdictions (AIHW 2005).

Under-identification

The incompleteness of Indigenous identification means the number of hospital separations recorded as Indigenous is an underestimate of hospitalisations involving Aboriginal and Torres Strait Islander peoples. While the identification of Indigenous people in hospitalisations is incomplete in all states and territories, four jurisdictions (Queensland, Western Australia, South Australia and the Northern Territory) have been assessed as having adequate Indigenous identification in 2003–04 (AIHW 2005). It has therefore been recommended that reporting of Indigenous hospital separations be limited to aggregated information from Queensland, Western Australia, South Australia and the Northern Territory. The proportion of the Indigenous population covered by these four jurisdictions is 60%. The following caveats have also been recommended:

- *Interpretation of results should take into account the relative quality of the data from the jurisdictions included (currently a degree of Indigenous under-identification in Western Australia and relatively marked Indigenous under-identification in Queensland data).*
- *Data for these four jurisdictions over-represent Indigenous populations in less urbanised and more remote locations.*
- *Hospitalisation data for four jurisdictions should not be assumed to represent the hospitalisation experience in other jurisdictions (ABS & AIHW 2005).*

Numerator and denominator

Rate and ratio calculations rely on good numerator and denominator data. The changes in the completeness of identification of Indigenous people in hospital records may take place at different rates than changes in the identification of Indigenous people in other administrative collections and population censuses. Denominators used here are sourced from ABS's Experimental estimates and projections: Aboriginal and Torres Strait Islander Australians 1991 to 2009 (ABS 2004).

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