

1.12 Children's hearing loss

This indicator includes a number of measures of children's hearing including prevalence rates and hospitalisation rates for diseases of the ear and mastoid process, and rates of ear and hearing problems managed at consultations with general practitioners

Data sources

Data for this measure come from the National Aboriginal and Torres Strait Islander Health Survey, the National Aboriginal and Torres Strait Islander Social Survey, the Western Australian Aboriginal Child Health Survey, the Bettering the Evaluation and Care of Health survey and the AIHW National Hospital Morbidity Database. Limited data are presented on child hearing screening from the state and territory health departments.

National Aboriginal and Torres Strait Islander Health Survey (NATSIHS)

The 2004–05 NATSIHS collected information from 10,439 Indigenous Australians of all ages. This sample was considerably larger than the supplementary Indigenous samples in the 1995 and 2001 National Health Surveys. The survey was conducted in remote and non-remote areas of Australia and collected a range of information from Indigenous Australians. This included information on health-related actions, health risk factors, health status, socioeconomic circumstances and women's health. The survey provides comparisons over time in the health of Indigenous Australians. It is planned to repeat the NATSIHS at 6-yearly intervals, with the next NATSIHS to be conducted in 2010–11. Selected non-Indigenous comparisons are available through the 2004–05 National Health Survey (NHS).

National Aboriginal and Torres Strait Islander Social Survey (NATSISS)

The Australian Bureau of Statistics (ABS) conducted the 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) between August 2002 and April 2003. The 2008 NATSISS was conducted between August 2008 and April 2009. The survey provides information about the Aboriginal and Torres Strait Islander populations of Australia for a wide range of areas of social concern including health, education, culture and labour force participation. The 2008 NATSISS included for the first time children aged under 15. The NATSISS will be conducted every six years, with the next survey planned for 2013.

The 2008 NATSISS collected information by personal interview from 13,300 Indigenous Australians across all states and territories of Australia, including those living in remote areas. The sample covered persons aged 15 years and over who are usual residents in selected private dwellings. It collected information on a wide range of subjects including family and culture, health, education, employment, income, financial stress, housing, and law and justice.

Western Australian Aboriginal Child Health Survey

This survey was a large-scale investigation into the health of 5,289 Western Australian Aboriginal and Torres Strait Islander children aged 0–17 years. The Telethon Institute for Child Health Research, in conjunction with the Kulunga Research Network, undertook this survey in 2001 and 2002. The survey was the first to gather comprehensive health, educational and developmental information on a population-based sample of Aboriginal and Torres Strait Islander children and their families and communities.

The survey findings were published in four volumes between June 2004 and November 2006.

Bettering the Evaluation and Care of Health (BEACH) survey

Information about encounters in general practice is available from the BEACH survey, which the AIHW Australian General Practice Statistics and Classification Unit conducts.

Information is collected from a random sample of approximately 1,000 general practitioners (GPs) from across Australia each year. A sample of 100 consecutive GP-patient encounters is collected from each GP. A more detailed explanation of the BEACH methods can be found in *General practice activity in Australia 2008-09* (Britt et al. 2009).

The number of Indigenous patients identified in the BEACH survey is likely to be underestimated because some GPs might not ask the question on Indigenous status, or the patient may choose not to identify themselves (AIHW 2002). Further detailed analyses of this issue are covered in *General practice in Australia, health priorities and policies 1998-2008* (Britt & Miller 2009:101):

'The findings of a BEACH substudy confirmed this suspected under-identification. In the data period reported here, 1.4% of patients encountered identified themselves as Indigenous. In contrast, in a BEACH substudy that asked 9,245 patients a complete set of questions about their cultural background (including Indigenous status) 2.2% (95% CI: 1.6-2.9) of respondents identified themselves as Indigenous (Britt et al. 2007). This rate is similar to the ABS estimates of Indigenous Australians as a proportion of the total population (ABS 2006).

However, the BEACH substudy included Indigenous Australians seen at Community Controlled Health Services funded through Medicare claims, and the estimate of 2.2% could have been an overestimate for the proportion of encounters that are with Indigenous patients in general practice as a whole. Deeble et al. (2008) conducted further investigations on this data and estimated that the BEACH encounter identification was an underestimate of about 10%, and that a more reliable estimate of the Indigenous population would be about 1.6% of all encounters (Deeble et al. 2008).

The findings of these studies are that some GPs are not routinely asking patients at the encounter about their Indigenous status, even when this is a variable specifically collected for each patient encountered, as it is in BEACH encounter data.'

Before the late inclusion of a 'not stated' category of Indigenous status in 2001-02, 'not stated' responses were included with non-Indigenous encounters. Since then, GP encounters for which Indigenous status was not reported have been included with encounters for non-Indigenous people under the 'other' category.

Data are presented for the 5-year period 2004-05 to 2008-09, during which there were 6,137 GP encounters with Aboriginal and Torres Strait Islander patients recorded in the survey, representing 1.3% of total GP encounters in the survey.

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. State and territory health departments provide information annually on the characteristics, diagnoses and care of admitted patients in public and private hospitals to the AIHW.

Data are presented for the six jurisdictions that have been assessed by the AIHW as having adequate identification of Indigenous hospitalisations in 2006–08 – New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory. These six jurisdictions represent approximately 96% of the Indigenous population of Australia. Data are presented by state/territory of usual residence of the patient.

In the period 2007–08, there were 276,000 hospital separations (episodes of care for admitted patients) for Aboriginal and Torres Strait Islander patients, around 3.5% of all separations. The proportion of separations of Aboriginal and Torres Strait Islander persons was higher in public hospitals (5.4% or 256,425 separations) compared with private hospitals (0.6% or 20,015 separations). Of all Aboriginal and Torres Strait Islander separations, nearly 93% occurred in public hospitals (AIHW 2009).

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, because 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 2-year period from July 2006 to June 2008. An aggregate of 2 years of data has been used, because 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. This can include a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay beginning or ending in a change in the type of care (for example, from acute to rehabilitation). 'Separation' also means the process by which an admitted patient completes an episode of care by being discharged, dying, transferring to another hospital or changing type of care.

Deadly Ears Program in Queensland

Deadly Ears is a Queensland state-wide Aboriginal and Torres Strait Islander Ear Health Program managed from within the Children's Health Services District. It is a multi-disciplinary program targeting the prevention and management of ear disease and its associated impacts in Aboriginal and Torres Strait Islander children. The program has been screening Indigenous children across Queensland and collating the results since 2006. Data are collected on clients who report to outreach clinics after being identified as having ear health issues through screening or referrals from other health services.

Analysis

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

Self-reported prevalence

Self-reported data from the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) on the prevalence of diseases of the ear and mastoid are presented in tables 1.12.1 and 1.12.7 and in Figure 1.12.1. Self-reported data from the National Aboriginal and Torres Strait Islander Social Survey (NATSISS) on the prevalence of diseases of the ear and mastoid are presented in tables 1.12.2, 1.12.3, 1.12.4 and 1.12.5. Table 1.12.6 provides data using both the NATSIHS and NATSISS.

Prevalence by age

- In 2004–05, approximately 10% of Indigenous children aged 0–14 years reported having ear or hearing problems compared with 3% of non-Indigenous children of the same age (table 1.12.1).
- Diseases of the ear and mastoid were more prevalent among Indigenous children aged 5–14 years (12%) than among Indigenous children aged 0–4 years (6%) (Figure 1.12.1).
- Complete or partial deafness/ hearing loss and otitis media were both more prevalent among Indigenous children than among non-Indigenous children. Approximately 5% of Indigenous children aged 0–14 years reported complete or partial hearing loss or deafness compared with 1% of non-Indigenous children. Approximately 4% of Indigenous children of the same age reported otitis media compared with 2% of non-Indigenous children. Otitis media is infection and inflammation of the middle ear space and eardrum. Symptoms include earache, fever and, in some cases, diminished hearing.

Table 1.12.1: Children reporting diseases of the ear and mastoid, by Indigenous status and age group, Australia, 2004–05^(a)

Age (years)	0–4		5–14		0–14	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
	Per cent					
Complete or partial deafness/ hearing loss	2 ^(b)	1 ^(b)	6*	2*	5*	1*
Otitis media	4*	2 ^(b)	5*	1*	4*	2*
Other diseases of the ear and mastoid	— ^(b)	— ^(c)	2 ^(b)	1	1 ^(b)	—
Total^{(d)(e)}	6*	2*	12*	3*	10*	3*
Total number	60,183	1,198,038	120,486	2,561,973	180,669	3,760,010

* Represents results with statistically significant differences in the Indigenous/non-Indigenous comparisons.

(a) Self-reported data from the National Aboriginal and Torres Strait Islander Health Survey 2004–05 and National Health Survey 2004–05.

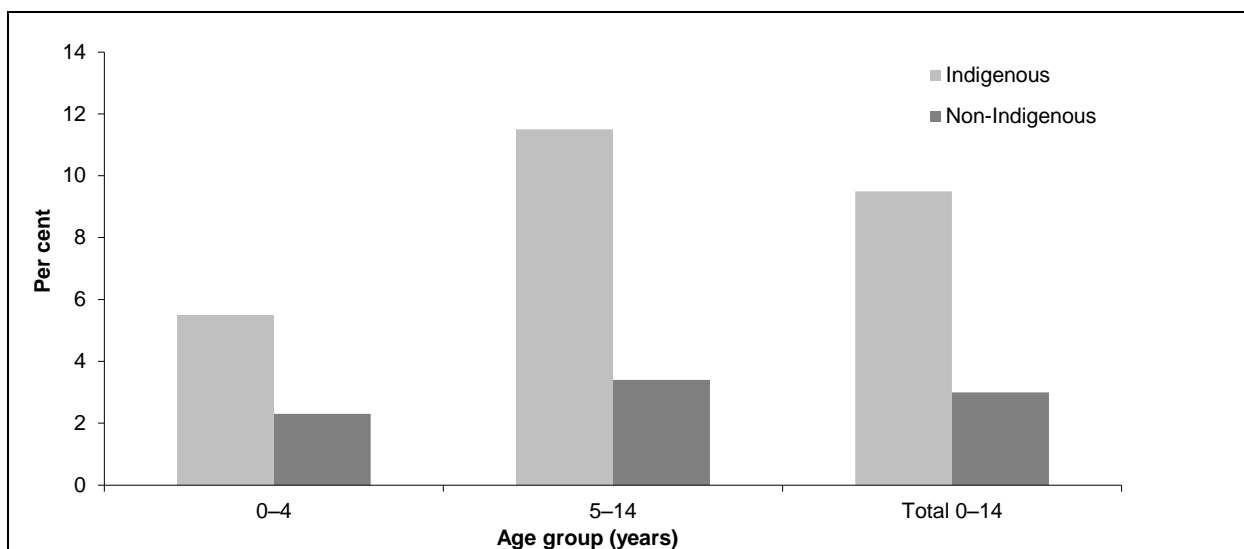
(b) Estimates having a relative standard error of between 25% and 50% and should be used with caution.

(c) Estimate having a relative standard error greater than 50% are considered too unreliable for general use.

(d) Includes 'Type of ear/hearing problem' not known.

(e) Components may not add to total as persons may have reported more than one type of condition.

Source: ABS and AIHW analysis of 2004–05 National Aboriginal and Torres Strait Islander Health Survey and 2004–05 National Health Survey.



Source: ABS and AIHW analysis of National Aboriginal and Torres Strait Islander Health Survey 2004-05.

Figure 1.12.1: Proportion of children aged 0-14 years reporting ear and hearing problems, by Indigenous status and age group, 2004-05

Prevalence by sex

- In 2008, ear or hearing problems were reported for approximately 9% of Indigenous children aged 0-14 years. Around 3% of children had total or partial hearing loss, and 3% of children had otitis media.
- The prevalence was similar for males (around 9%) and females (around 9%).

Table 1.12.2: Proportion of Indigenous children reporting ear/hearing problems, by sex, 2008

Type of ear/hearing problem	Males	Females	Australia
	Per cent		
<i>Total has ear/hearing problems^(a)</i>	8.6	8.7	8.6
Total or partial hearing loss	2.8	2.7	2.8
Runny ears or glue ear (otitis media)	3.2	2.9	3.1
Other	2.5	2.9	2.7
Does not have ear/hearing problems	91.4	91.3	91.4
Total^(b)	100.0	100.0	100.0
Total number	97,460	94,083	191,543
Not known	1.0 ^(a)	0.8 ^(a)	0.9

(a) Estimate has a relative standard error of between 25% and 50% and should be used with caution.

(b) Excludes not known responses.

Source: AIHW analyses of 2008 NATSISS.

Prevalence by state/territory

- The Northern Territory had the highest proportion of Indigenous children reporting ear and hearing problems (12%), followed by New South Wales (10%) (Table 1.12.3).
- Victoria had the lowest proportion of Indigenous children reporting ear and hearing problems (6%).

Table 1.12.3: Proportion of Indigenous children reporting ear/hearing problems, by state/territory, 2008

	NSW	Vic	Qld	WA	SA	Tas/ACT	NT	Aust.
	Per cent							
Type of ear/hearing problem								
<i>Total has ear/hearing problems(a)</i>	9.6	5.6	6.9	9.0	7.8	7.8	12.1	8.6
Total or partial hearing loss	2.6	1.2 ^(a)	3.0 ^(a)	2.3 ^(a)	2.7 ^(a)	2.8 ^(a)	3.9	2.8
Runny ears or glue ear (otitis media)	4.2	1.7 ^(a)	1.9 ^(a)	4.7	2.0 ^(a)	2.4 ^(a)	2.7 ^(a)	3.1
Other	2.7	2.6 ^(a)	2.3 ^(a)	1.6 ^(a)	2.8 ^(a)	2.6 ^(a)	4.5	2.7
Does not have ear/hearing problems	90.4	94.4	93.1	91.0	92.2	92.2	87.9	91.4
Total^(c)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total number	57,708	12,186	55,688	25,395	10,246	8,343	21,977	191,543
Not known	1.0 ^(a)	1.3 ^(a)	1.0 ^(a)	0.7 ^(a)	0.5 ^(b)	0.1 ^(b)	0.5 ^(b)	0.9

(a) Estimate has a relative standard error of between 25% and 50% and should be used with caution.

(b) Estimate has a relative standard error of greater than 50% and is considered too unreliable for general use.

(c) Excludes not known responses.

Source: AIHW analyses of 2008 NATSISS.

Prevalence by remoteness

Tables 1.12.4 and 1.12.5 present the proportion of Indigenous children with ear or hearing problems by remoteness. The type of ear or hearing problem is presented in Table 1.12.4 and the type of treatment received is presented in Table 1.12.5.

- In remote areas, 10% of Indigenous children aged 0–14 years old had some type of ear or hearing problem, compared to 8% in non-remote areas (Table 1.12.4).
- There was a significant difference between remote (4%) and non-remote (2%) areas for Indigenous children aged 0–14 years with total or partial hearing loss (Table 1.12.4).
- During 2008, in remote areas 23% of Indigenous children with an ear or hearing problem received treatment from a hearing specialist, compared to 40% in non-remote areas (Table 1.12.5).
- In remote areas, 16% of Indigenous children with ear or hearing problems did not receive treatment as it was either not sought, treatment was unavailable or too

expensive. This is in comparison to 9% of Indigenous children with ear or hearing problems in non-remote areas of Australia (Table 1.12.5).

Table 1.12 4: Number and proportion of Indigenous children aged 0–14 years with reported ear or hearing problems, by type of ear or hearing problem and remoteness, 2008

Type of ear/hearing problem	Non-remote		Remote		Australia	
	Number	Per cent	Number	Per cent	Number	Per cent
Total or partial hearing loss	3,503	2.4*	1,780	3.9*	5,283	2.8
Runny ears or glue ear (otitis media)	4,701	3.2	1,147	2.5	5,848	3.1
Other ^(a)	4,052	2.8	1,796	4.0	5,848	3.1
<i>Total has ear/hearing problems^(b)</i>	<i>11,833</i>	<i>8.1</i>	<i>4,644</i>	<i>10.3</i>	<i>16,478</i>	<i>8.6</i>
Does not have ear/hearing problems	134,581	91.9	40,485	89.7	175,065	91.4
Total^(c)	146,414	100.0	45,129	100.0	191,543	100.0
Total number	147,946	..	45,303	..	193,249	..
Not known	1,532	..	174	..	1,706	..

(a) Comprises tinnitus, otitis (external) and other hearing problems n.f.d.

(b) Total will be less than the sum of the components as a child may have had more than one type of ear/hearing problem.

(c) Excludes not known responses.

Source: AIHW analyses of 2008 NATSISS.

Table 1.12.5: Proportion of Indigenous children reporting ear/hearing problems who received treatment, by remoteness, 2008

Type of treatment received	Non-remote	Remote	Australia
	Per cent		
Medication (including eardrops)	45.7	48.9	46.6
Checked by an ear or hearing specialist	40.3	22.9	35.4
Surgery	25.6	18.6	23.6
Other	16.0	10.9 ^(a)	14.6
<i>Total received treatment</i>	<i>91.2</i>	<i>83.7</i>	<i>89.1</i>
No treatment sought/unable to afford treatment/no treatment available	8.8 ^(a)	16.3	10.9
Total who have ear/hearing problems	100.0	100.0	100.0
Total number	11,833	4,644	16,478

(a) Estimate has a relative standard error of between 25% and 50% and should be used with caution.

Source: AIHW analyses of 2008 NATSISS.

Time series

- In 2008, prevalence of diseases of the ear and mastoid process was higher among Indigenous children aged 0–14 years in remote areas (11% males and 10% females) than those in non-remote areas (8% males and 8% females) (Table 1.12.6).
- Overall, there has been slight decrease in the prevalence of ear and hearing problems among Indigenous children aged 0–14 years between 2001 and 2008, in both remote and non-remote areas. The decline in remote areas over this period for Indigenous males was from 18% in 2001 to 11% in 2008, and for Indigenous females it was from 18% in 2001 to 10% in 2008.

Table 1.12.6: Indigenous children aged 0–14 years with ear/hearing problems, by remoteness, 1995, 2001, 2004–05, and 2008

	1995 ^(a)			2001			2004–05			2008		
	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons
	Per cent											
Remote ^{(b)(c)}	n.a.	n.a.	n.a.	18	18	18	12	13	13	10.5	10.1	10.0
Non-remote	7.2	5.0	5.9	6.4 ^(b)	11	9	9	8	9	8.0	8.0	8.0
Total^(c)	n.a.	n.a.	n.a.	10	13	11	10	10	10	9.0	9.0	9.0
Total no.	54,392	52,401	106,793	90,615	85,878	176,493	92,767	87,902	180,699	97,460	94,083	191,543

(a) Data for the National Aboriginal and Torres Strait Islander Health Survey 1995 are available for non-remote areas only.

(b) Estimate has a relative standard error between 25% and 50% and should be used with caution.

Source: ABS and AIHW analysis of 1995 and 2001 NHS (Indigenous supplement), 2004–05 NATSIHS; and 2008 NATSISS.

Prevalence by selected population and health characteristics

Table 1.12.7 presents the proportion of Indigenous children aged 0–14 years who had ear and circulatory problems by selected demographic characteristics and risk factors.

- In 2004–05, among Indigenous children aged 0–14 years, a higher proportion of those who lived in households with regular smokers who smoked indoors at home reported having ear and hearing problems than those who did not live with regular smokers who smoked indoors at home (13% compared to 8%).
- Indigenous children who lived in overcrowded households or in lowest SES group were more likely to have ear and hearing problems (both 15%) than Indigenous children who did not live in overcrowded households (8%) or were in highest SES group (11%).
- A higher proportion (21% and 14%) of Indigenous children aged 12–14 years who reported they did not eat vegetables daily and/or did not eat fruit daily reported ear and hearing problems than Indigenous children who did eat fruit and vegetables daily (both 8%).
- Approximately 11% of Indigenous children whose last consultation with a GP or specialist was less than 3 months ago reported ear and hearing problems compared to 8% of Indigenous children whose last GP or specialist consultation was 3 or more months ago.

Table 1.12.7: Proportion of Indigenous children aged 0–14 years with ear/hearing problems, by selected demographic characteristics and risk factors, 2004–05

	Has ear/hearing problems	Does not have ear/hearing problems
	Per cent	
Lives in households with regular smokers		
Yes	10.4	89.6
No	8.0	92.0
Lives in households with regular smokers who smoke at home indoors		
Yes	13.0	87.0
No	8.3	91.7
Overcrowding in housing		
Yes	14.5	85.5
No	8.3	92.0
SEIFA—index of socioeconomic status (SES)		
Lowest SES	14.7	85.3
Highest SES	10.6	89.4
Eats vegetables daily^(a)		
Yes	7.7	92.3
No	20.8	79.2
Eats fruit daily^(a)		
Yes	7.8	92.2
No	13.8	86.2
Time since consulted GP/specialist		
Less than 3 months	11.0	89.0
3 months or more	8.4	91.6
Total (per cent)	9.5	90.5
Total number	17,097	163,572

(a) Children aged 12–14 years.

Source: AIHW analysis of 2004–05 National Aboriginal and Torres Strait Islander Health Survey.

Hospitalisations

- For the 2-year period July 2006 to June 2008, in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory, there were 53,754 hospitalisations from diseases of the ear and mastoid process among children aged 0–14 years, 5% of which were hospitalisations of Aboriginal and Torres Strait Islander children.
- Diseases of the ear and mastoid process accounted for 4.3% of total hospitalisations among Indigenous children aged 0–14 years.

Hospitalisations by age and principal diagnosis

- For the 2-year period July 2006 to June 2008, in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined, for diseases of the ear and mastoid process there were 1,129 hospitalisations among Indigenous children aged 0–4 years, and 1,527 hospitalisations among those aged 5–14 years. This represented 3% and 6% of total hospitalisations among Indigenous children respectively (Table 1.12.8).
- While Indigenous children aged 0–4 years were less likely to be hospitalised for diseases of the ear and mastoid process than other children, Indigenous children aged 5–14 years were 1.4 times as likely as to be hospitalised for these diseases.
- Over the period July 2006 to June 2008, Indigenous children aged 0–14 years in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined were hospitalised for diseases of the ear and mastoid process at similar rates to other Australians.

Hospitalisations for tympanoplasty procedures

Indigenous children aged 0–14 years had reported rates of tympanoplasty procedures with a principal diagnosis of otitis media at four times the rate of other children. Differences observed in hospitalisations from otitis media may be due to the chronic nature of the disease among Indigenous children resulting in greater damage to the eardrum.

Table 1.12.8: Hospitalisations for diseases of the ear and mastoid process, by Indigenous status, children aged 0–14 years, NSW, Vic, Qld, WA, SA and NT, July 2006 to June 2008^{(a)(b)(c)(d)(e)}

	Number		Per cent ^(f)		Indigenous			Other ^(f)			Rate ratio ^(j)
	Indigenous	Other ^(f)	Indigenous	Other ^(f)	No. per 1,000 ^(g)	LCL 95% ^(h)	UCL 95% ⁽ⁱ⁾	No. per 1,000 ^(g)	LCL 95% ^(h)	UCL 95% ⁽ⁱ⁾	
Aged 0–4 years											
Diseases of middle ear and mastoid (H65–H75)	1,028	27,378	2.7	4.8	8.3	7.8	8.8	11.2	11.0	11.3	0.7 [*]
Other disorders of ear (H90–H95)	52	1,376	0.1	0.2	0.4	0.3	0.5	0.6	0.5	0.6	0.7 [*]
Diseases of the external ear (H60–H62)	47	570	0.1	0.1	0.4	0.3	0.5	0.2	0.2	0.3	1.6 [*]
Diseases of inner ear (H80–H83)	2	31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Total	1,129	29,355	3.0	5.1	9.1	8.5	9.6	12.0	11.8	12.1	0.8[*]
Aged 5–14 years											
Diseases of middle ear and mastoid (H65–H75)	1,413	19,738	6.0	4.6	5.7	5.4	6.0	3.9	3.9	4.0	1.4 [*]
Other disorders of ear (H90–H95)	54	894	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	1.2
Diseases of the external ear (H60–H62)	55	1,043	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	1.1
Diseases of inner ear (H80–H83)	5	68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Total	1,527	21,743	6.4	5.1	6.1	5.8	6.5	4.3	4.3	4.4	1.4[*]
Aged 0–14 years											
Diseases of middle ear and mastoid (H65–H75)	2,441	47,116	3.9	4.7	6.5	6.3	6.8	6.2	6.1	6.2	1.1 [*]
Other disorders of ear (H90–H95)	106	2,270	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	1.0
Diseases of the external ear (H60–H62)	102	1,613	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	1.3 [*]
Diseases of inner ear (H80–H83)	7	99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Total NSW, Vic, Qld, WA, SA & NT	2,656	51,098	4.3	5.1	7.1	6.8	7.4	6.7	6.6	6.8	1.1[*]
Total Australia^(k)	2,697	53,067	4.3	5.1	6.9	6.7	7.2	6.8	6.8	6.9	1.0

(continued)

Table 1.12.8 (continued): Hospitalisations for diseases of the ear and mastoid process, by Indigenous status, children aged 0–14 years, NSW, Vic, Qld, WA, SA and NT, July 2006 to June 2008^{(a)(b)(c)(d)(e)}

* Represents results with a statistically significant difference in the Indigenous/other comparisons.

- (a) Data are from public and most private hospitals. Jurisdictional data excludes private hospitals in the Northern Territory.
- (b) Categories are based on the ICD-10-AM 5th edition (National Centre for Classification in Health 2006); ICD-10-AM codes H60–H95.
- (c) Financial year reporting.
- (d) Data are reported by state/territory of usual residence of the patient hospitalised and are for New South Wales, Victoria, Western Australia, South Australia, the Northern Territory and Queensland only. These six jurisdictions are considered to have adequate levels of Indigenous identification, although the level of accuracy varies by jurisdiction and hospital. Hospitalisation data for these six jurisdictions should not be assumed to represent the hospitalisation experience in the other jurisdictions.
- (e) Proportion of total hospitalisations for Indigenous and non-Indigenous people in that age group for the period 2006–07 to 2007–08.
- (f) 'Other' includes hospitalisations of non-Indigenous people and those for whom Indigenous status was not stated.
- (g) Age-specific hospitalisation rate using the average Indigenous December populations for the relevant years.
- (h) LCL = lower confidence limit.
- (i) UCL = upper confidence limit.
- (j) Rate ratio Indigenous: other.
- (k) Includes all separations in all eight states and territories, including the Australian Capital Territory and Tasmania; Other Territories and Residence State not applicable (e.g. overseas, at sea, no fixed address).

Notes

1. Indigenous rates are calculated using population estimates based on the 2006 Census (SERIES B).
2. Care types 7.3, 9 and 10 (Newborn – unqualified days only; organ procurement; hospital boarder) excluded from analysis.

Source: AIHW analysis of National Hospital Morbidity Database.

Hospitalisations by remoteness

Hospitalisation rates for children with diseases of the ear and mastoid process in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory are presented by Australian Standard Geographical Classification (ASGC) in Table 1.12.9, covering the period July 2007 to June 2009.

- Indigenous children in all *Remote* and *Very remote* areas were more likely to be hospitalised for these conditions than other Australians. The ratio of hospitalisations of Indigenous people compared to other Australians was higher and the difference was statistically significant only for *Remote* and *Very remote* areas.
- Rates of hospitalisations per 1,000 children were highest for Indigenous children living in *Very remote* areas, at 3.0 per 1,000. The rate was also highest for other Australian children who lived in *Very remote* areas, at 1.6 per 1,000. The lowest rates were observed in *Major cities* for Indigenous children (1.2 per 1,000) and *Remote* areas for other Australian children (1.2 per 1,000).
- Indigenous children were hospitalised for these conditions at a rate of two times that of other Australians in *Remote* and *Very remote* areas of Australia. In *Major cities* areas, where the lowest ratio of 0.8 was observed, other Australian children were hospitalised more frequently than Indigenous children, however this difference was not statistically significant.

Table 1.12.9: Hospitalisations for diseases of the ear and mastoid process, children aged 0 to 14 years, by Indigenous status and remoteness, NSW, Vic, Qld, WA, SA and NT, July 2007 to June 2009^{(a)(b)(c)(d)(e)(f)}

	Indigenous				Other ^(g)				Ratio ^(k)
	Number	No. per 1,000 ^(h)	LCL 95% ⁽ⁱ⁾	UCL 95% ⁽ⁱ⁾	Number	No. per 1,000 ^(h)	LCL 95% ⁽ⁱ⁾	UCL 95% ⁽ⁱ⁾	
Major cities	693	1.2	1.1	1.3	38,327	1.5	1.5	1.5	0.8
Inner regional	585	1.5	1.4	1.6	10,485	1.5	1.5	1.5	1.0
Outer regional ^(l)	540	1.4	1.2	1.5	4,248	1.3	1.3	1.3	1.0
Remote	421	2.5	2.3	2.8	654	1.2	1.1	1.3	2.0*
Very remote	806	3.0	2.7	3.4	254	1.6	1.5	1.6	2.0*
Total^(m)	3,047	1.7	1.6	1.7	53,977	1.5	1.5	1.5	1.1*

* Represents results with statistically significant differences in the Indigenous/other comparisons at the $p < 0.05$ level.

(n) Data are from public and most private hospitals. Jurisdictional data excludes private hospitals in the Northern Territory.

(o) Categories are based on the ICD-10-AM 5th edition (National Centre for Classification in Health 2006).

(p) Financial year reporting.

(q) Data are reported by state/territory of usual residence of the patient hospitalised.

(r) Age-standardised rates for New South Wales, Victoria, Queensland, Western Australia, South Australia, the Northern Territory and Australia have been calculated using the direct method, age-standardised by five-year age group to 65+.

(s) New South Wales, Victoria, Western Australia, South Australia, the Northern Territory and Queensland are considered to have adequate levels of Indigenous identification, although the level of accuracy varies by jurisdiction and hospital. Hospitalisation data for these six jurisdictions should not be assumed to represent the hospitalisation experience in the other jurisdictions.

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

(u) Directly age-standardised using the Australian 2001 standard population.

(v) LCL = lower confidence limit.

(w) UCL = upper confidence limit.

(x) Rate ratio Indigenous: other.

(y) *Outer regional* includes remote Victoria.

(z) Total includes hospitalisations where ASGC is missing.

Notes

3. Rates for Indigenous are calculated using the 2006 population estimates based on the 2006 Census (Series B).

4. Care types 7.3, 9 and 10 (Newborn – unqualified days only; organ procurement; hospital boarder) excluded from analysis.

Source: AIHW analysis of National Hospital Morbidity Database.

Time series analysis

Time series data from 2001–02 to 2007–08 for children aged 0–14 years are presented for the four jurisdictions that have been assessed as having adequate identification of Indigenous hospitalisations over this period – Queensland, Western Australia, South Australia and the Northern Territory. These four jurisdictions represent approximately 60% of the Indigenous Australian population (Table 1.12.10).

Additional trend analysis for children aged 0–14 years has also been presented for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined from 2004–05 to 2007–08 for Indigenous and Other Australians. New South Wales and Victoria have been assessed as having adequate identification of Indigenous hospitalisations from 2004–05. These six jurisdictions represent approximately 96% of the Indigenous population of Australia.

Diseases of the ear and mastoid process – 2001–02 to 2007–08

Hospitalisation rates, rate ratios and rate differences between Indigenous and other Australians for diseases of the ear and mastoid process over the 7-year period 2001–02 to 2007–08 are presented in Table 1.12.10 and Figure 1.12.2.

- In Queensland, Western Australia, South Australia and the Northern Territory combined, there were declines in hospitalisation rates for diseases of the ear and mastoid process among Indigenous children aged 0–14 years during the period 2001–02 to 2007–08, with an average yearly decline in the rate of around 0.1 per 1,000 population. This is equivalent to a 10% reduction in the rate over the period. However, the declines in hospitalisation rates were only significant for females.
- There were significant declines in hospitalisation rates among other Australian children, with an average yearly decline in the rate of 0.3 per 1,000. This is equivalent to a 22% decline in the rate over the period. The declines in hospitalisation rates were significant for both males and females.
- There was a significant increase of 13% in the hospitalisation rate ratio between Indigenous and other children during the period 2001–02 to 2007–08. During the same period, there was a fall in the rate difference of two and one quarter times.

Note 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, as will changes in access, hospital policies and practices 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 also reflect increased use of admitted patient hospital services rather than a worsening of health.

Table 1.12.10: Age-standardised hospitalisation rates, rate ratios and rate differences from diseases of the ear and mastoid process, children aged 0–14 years, Qld, WA, SA and NT, 2001–02 to 2007–08^(a)

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	Annual change ^(b)	Per cent change over period ^(c)
Indigenous separations									
Males	520	469	532	490	504	472	511	–2	–2.0
Females	484	411	434	417	389	384	416	–11*	–13.4*
Persons	1,004	880	966	907	893	856	927	–13	–7.5
Other Australian separations									
Males	7,764	7,733	7,483	7,445	6,963	6,677	6,790	–198*	–15.3*
Females	5,342	5,114	4,982	4,882	4,588	4,572	4,550	–138*	–15.5*
Persons	13,106	12,848	12,465	12,327	11,551	11,249	11,340	–336*	–15.4*
Indigenous rate per 1,000									
Males	8.9	8.0	9.0	8.3	8.5	7.9	8.6	–0.1	–3.6
Females	8.9	7.4	7.8	7.4	6.9	6.8	7.3	–0.2*	–16.7*
Persons	8.9	7.7	8.4	7.9	7.7	7.4	7.9	–0.1	–10.0
Other Australian^(d) rate (no. per 1,000)									
Males	10.8	10.8	10.4	10.2	9.4	8.8	8.8	–0.4*	–21.7*
Females	7.9	7.5	7.3	7.1	6.5	6.4	6.2	–0.3*	–21.3*
Persons	9.4	9.2	8.9	8.7	8.0	7.7	7.5	–0.3*	–21.5*
Rate ratio^(e)									
Males	0.8	0.7	0.9	0.8	0.9	0.9	1.0	0.03*	21.5*
Females	1.1	1.0	1.1	1.1	1.1	1.1	1.2	0.0	4.7
Persons	0.9	0.8	1.0	0.9	1.0	1.0	1.1	0.02*	13.3*

(continued)

Table 1.12.10 (continued): Age-standardised hospitalisation rates, rate ratios and rate differences from diseases of the ear and mastoid process, children aged 0-14 years, Qld, WA, SA and NT, 1998-99 to 2007-08^(a)

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Annual change ^(b)	Per cent change over period ^(c)
Rate difference^(f)									
Males	-1.9	-2.8	-1.3	-1.9	-0.9	-0.9	-0.2	0.3*	-104.3*
Females	1.0	-0.1	0.5	0.4	0.4	0.4	1.1	0.0	18.4
Persons	-0.5	-1.5	-0.4	-0.8	-0.3	-0.3	0.4	0.2*	-228.9*

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the period 1998-99 to 2007-08.

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

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

(c) Per cent change between 1998-99 and 2007-08 based on the average annual change over the period.

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

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

(f) Hospitalisation rates for Indigenous Australians minus hospitalisation rates for other Australians.

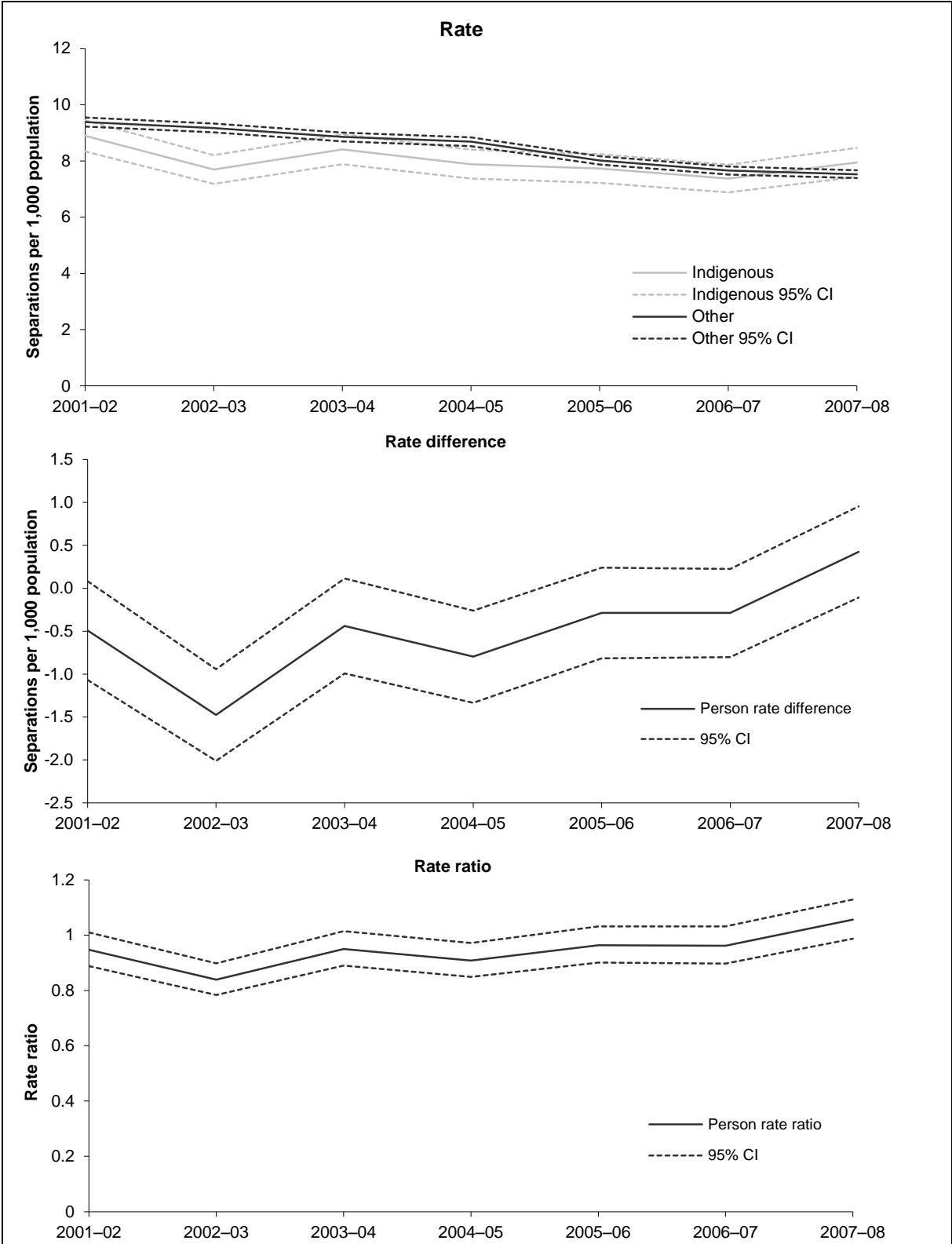
Notes

1. Rates have been directly age-standardised using the 2001 Australian standard population.

2. Population estimates are based on the 2006 Census.

3. Care types 7.3, 9 and 10 (Newborn – unqualified days only; organ procurement; hospital boarder) included in analysis because of changes in coding since earlier years.

Source: AIHW analysis of National Hospital Morbidity Database.



Source: AIHW analysis of National Hospital Morbidity Database.

Figure 1.12.2: Hospitalisation rates, rate ratios and rate differences between Indigenous and other children aged 0-14 years from diseases of the ear and mastoid process, Qld, WA, SA and NT, 1998-99 to 2007-08

Diseases of the ear and mastoid process – 2004–05 to 2007–08

Hospitalisation rates, rate ratios and rate differences between Indigenous and other Australians for diseases of the ear and mastoid process over the three year period 2004–05 to 2007–08 are presented in Table 1.12.11 and Figure 1.12.3.

- In New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined, there were no significant changes in hospitalisation rates for diseases of the ear and mastoid process, among Indigenous children aged 0–14 years during the period 2004–05 to 2007–08. Overall, there was an average yearly increase in the rate of around 0.1 per 1,000 population. This is equivalent to a 3% increase in the rate over the period.
- There were significant declines in hospitalisation rates among other Australian children, with an average yearly decline in the rate of 0.3 per 1,000. This is equivalent to a 11% decline in the rate over the period. The declines in hospitalisation rates were significant for both males and females.
- There was a significant increase of 16% in the hospitalisation rate ratio between Indigenous and other children during the period 2004–05 to 2007–08. During the same period, the rate difference between Indigenous and other children declined by 1.65 times.

Note 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, as will changes in access, hospital policies and practices 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 also reflect increased use of admitted patient hospital services rather than a worsening of health.

Table 1.12.11: Age-standardised hospitalisation rates, rate ratios and rate differences from diseases of the ear and mastoid process, children aged 0-14 years, NSW, Vic, Qld, WA, SA and NT, 2004-05 to 2007-08^(a)

	2004-05	2005-06	2006-07	2007-08	Annual change ^(b)	Per cent change over period ^(c)
Indigenous separations						
Males	720	722	718	768	14	5.8
Females	594	563	563	607	4	2.0
Persons	1,314	1,285	1,281	1,375	18	4.1
Other Australian separations						
Males	16,936	15,635	15,024	15,552	-476	-8.4
Females	11,071	10,422	10,131	10,391	-233	-6.3
Persons	28,007	26,057	25,155	25,943	-709	-7.6
Indigenous rate (no. per 1,000)						
Males	7.6	7.6	7.5	8.0	0.1	4.9
Females	6.5	6.2	6.2	6.6	0.0	0.7
Persons	7.1	6.9	6.8	7.3	0.1	3.0
Other Australian^(d) rate (no. per 1,000)						
Males	9.1	8.3	7.9	8.0	-0.4*	-11.9*
Females	6.3	5.8	5.6	5.7	-0.2*	-9.7*
Persons	7.7	7.1	6.8	6.9	-0.3*	-11.0*
Rate ratio^(e)						
Males	0.8	0.9	1.0	1.0	0.05*	19.2*
Females	1.0	1.1	1.1	1.2	0.04*	11.4*
Persons	0.9	1.0	1.0	1.1	0.05*	15.8*

(continued)

Table 1.12.11 (continued): Age-standardised hospitalisation rates, rate ratios and rate differences from diseases of the ear and mastoid process, children aged 0-14 years, NSW, Vic, Qld, WA, SA and NT, 2004-05 to 2007-08^(a)

	2004-05	2005-06	2006-07	2007-08	Annual change ^(b)	Per cent change over period ^(c)
Rate difference^(f)						
Males	-1.5	-0.7	-0.4	-0.03	0.5*	-95.5*
Females	0.3	0.4	0.5	0.9	0.2*	224.5*
Persons	-0.6	-0.2	0.1	0.4	0.4*	-164.9*

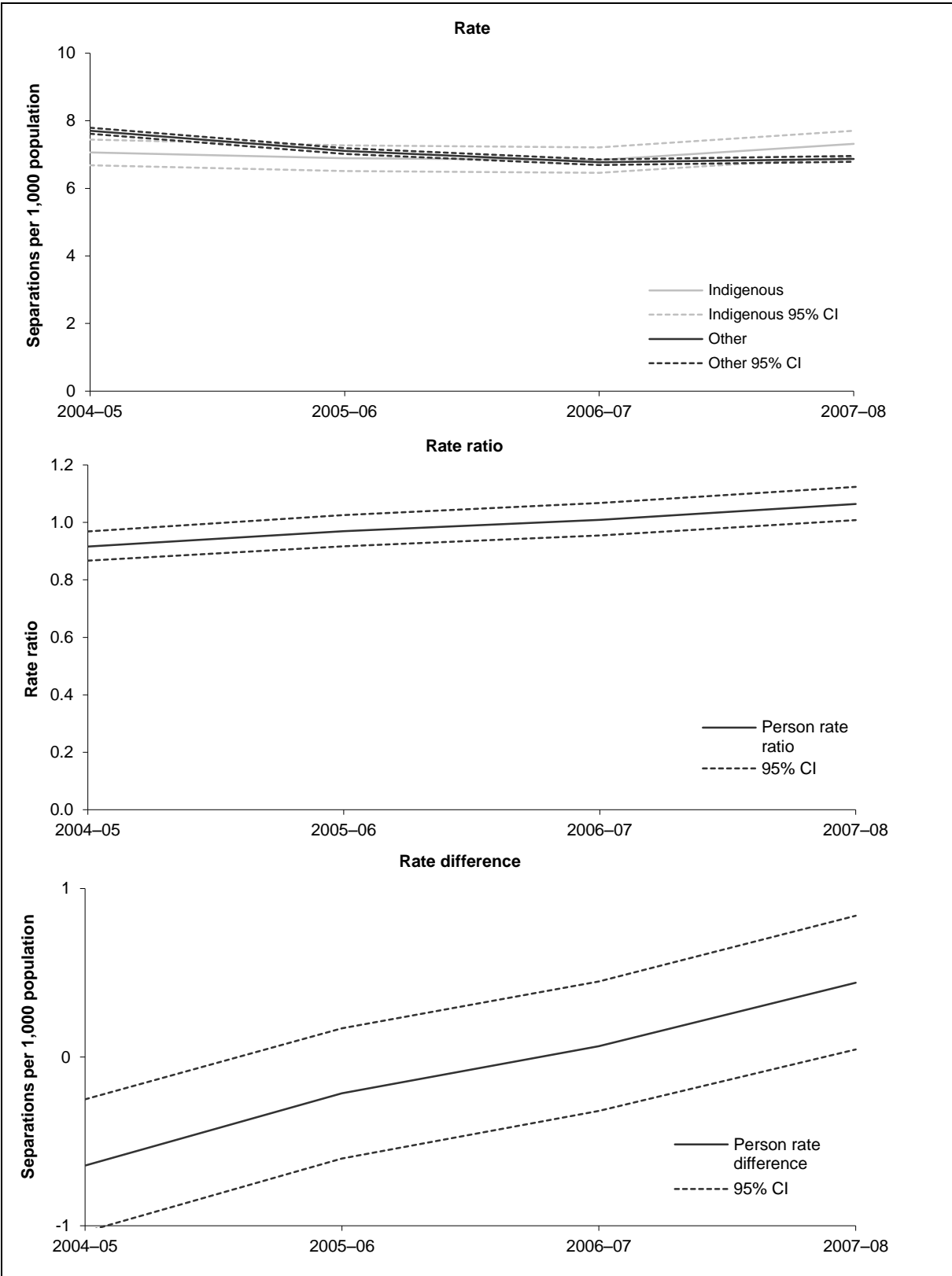
* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the period 2004-05 to 2007-08.

- (a) Data are from public and most private hospitals. Data exclude private hospitals in the Northern Territory.
- (b) Average annual change in rates, rate ratios and rate differences determined using linear regression analysis.
- (c) Per cent change between 2004-05 and 2007-08 based on the average annual change over the period.
- (d) 'Other' includes hospitalisations for non-Indigenous people and those for whom Indigenous status was not stated.
- (e) Hospitalisation rates for Indigenous Australians divided by hospitalisation rates for other Australians.
- (f) Hospitalisation rates for Indigenous Australians minus hospitalisation rates for other Australians.

Notes

1. Rates have been directly age-standardised using the 2001 Australian standard population.
2. Population estimates are based on the 2006 Census.
3. Care types 7.3, 9 and 10 (Newborn – unqualified days only; organ procurement; hospital boarder) excluded from analysis.

Source: AIHW analysis of National Hospital Morbidity Database.



Source: AIHW analysis of National Hospital Morbidity Database.

Figure 1.12.3: Hospitalisation rates, rate ratios and rate differences between Indigenous and other children aged 0-14 years from diseases of the ear and mastoid process, NSW, Vic, Qld, WA, SA and NT, 2004-05 to 2007-08

General practitioner encounters

Information about general practitioner (GP) encounters is available from the BEACH survey. Information is collected from a random sample of approximately 1,000 general practitioners from across Australia each year. A sample of 100 consecutive encounters is collected from each GP. Data for the 5-year BEACH reporting period April 2004–March 2005 to April 2008–March 2009 are presented in Table 1.12.12.

- In the period April 2004–March 2005 to April 2008–March 2009 there were 55,552 GP encounters with patients aged 0–14 years, 1,247 (2.2%) of which were with Aboriginal and Torres Strait Islander patients.
- Ear and hearing problems were responsible for 10% of total problems managed among Indigenous patients aged 0–14 years and 9.0% of total problems managed among other patients of the same age.
- Ear and hearing problems were managed at GP encounters with Indigenous children at similar rates to encounters with other children (at rates of 12.9 and 10.5 per 100 encounters for Indigenous and other children aged 0–14 years respectively).
- Acute otitis media/myringitis was the most common ear and hearing problem managed at GP encounters, responsible for 6.5% of total problems managed among Indigenous patients aged 0–14 years. It made up a greater proportion of problems managed in the 0–4 year age group (7.3%) than at encounters with children aged 5–14 years (5.6%).
- Acute otitis media/myringitis was managed at GP encounters with Indigenous children aged 0–14 years at similar rates than encounters with other children of the same age (8 and 7 per 100 encounters).

Table 1.12.12: Ear and hearing problems^(a) managed by general practitioners, by Indigenous status of patient, BEACH years April 2004–March 2005 to April 2008–March 2009^{(b)(c)}

	Number		Per cent total problems ^(d)		Indigenous			Other ^(f)			Ratio ⁽ⁱ⁾
	Indigenous	Other ^(e)	Indigenous	Other ^(e)	Number per 100 encounters ^(f)	95% LCL ^(g)	95% UCL ^(h)	Number per 100 encounters ^(f)	95% LCL ^(g)	95% UCL ^(h)	
0–4 years											
Acute otitis media/myringitis	61	2,421	7.3	7.1	9.2	6.9	11.5	8.3	7.9	8.7	1.1
Other infections of ear	15	394	1.8	1.2	2.3	1.0	3.6	1.4	1.2	1.5	1.7
<i>Subtotal infections of ear</i>	<i>76</i>	<i>2,815</i>	<i>9.1</i>	<i>8.3</i>	<i>11.5</i>	<i>9.1</i>	<i>13.8</i>	<i>9.7</i>	<i>9.2</i>	<i>10.1</i>	<i>1.2</i>
Hearing loss	0	9	0.0	—	0.0	..	..	—	..	..	0.0
Other diseases of the ear	5	396	0.6	1.2	0.8	—	1.5	1.4	1.2	1.5	0.6
Total diseases of the ear	81	3,220	9.7	9.5	12.2	9.7	14.7	11	10.6	11.5	1.1
5–14 years											
Acute otitis media/myringitis	40	1,342	5.6	4.6	6.8	4.7	9.0	5.3	5.0	5.6	1.3
Other infections of ear	22	693	3.1	2.4	3.8	2.0	5.5	2.8	2.5	3.0	1.4
<i>Subtotal infections of ear</i>	<i>62</i>	<i>2,035</i>	<i>8.6</i>	<i>7.0</i>	<i>10.6</i>	<i>7.8</i>	<i>13.4</i>	<i>8.1</i>	<i>7.7</i>	<i>8.5</i>	<i>1.3</i>
Hearing loss	0	24	0.0	0.1	0.0	..	..	0.1	0.1	0.1	0
Other diseases of the ear	18	412	2.5	1.4	3.1	1.6	4.5	1.6	1.5	1.8	1.9
Total diseases of the ear	80	2,471	11.1	8.4	13.7	10.3	17.0	9.8	9.4	10.2	1.4

(continued)

Table 1.12.12 (continued): Ear and hearing problems^(a) managed by general practitioners, by Indigenous status of patient, BEACH years April 2004–March 2005 to April 2008–March 2009^{(b)(c)}

	Number		Per cent total problems ^(e)		Indigenous			Other ^(f)			Ratio ^(j)
	Indigenous	Other ^(f)	Indigenous	Other ^(f)	Number per 100 encounters ^(g)	95% LCL ^(h)	95% UCL ⁽ⁱ⁾	Number per 100 encounters ^(g)	95% LCL ^(h)	95% UCL ⁽ⁱ⁾	
0–14 years											
Acute otitis media/ myringitis	101	3,763	6.5	6.0	8.1	6.5	9.7	6.9	6.7	7.2	1.2
Other infections of ear	37	1,087	2.4	1.7	3.0	1.9	4.1	2.0	1.9	2.1	1.5
<i>Subtotal infections of ear</i>	<i>138</i>	<i>4,850</i>	<i>8.9</i>	<i>7.7</i>	<i>11.1</i>	<i>9.3</i>	<i>12.8</i>	<i>8.9</i>	<i>8.6</i>	<i>9.2</i>	<i>1.2</i>
Hearing loss	0	33	0.0	0.1	0.0	..	..	0.1	—	0.1	0.0
Other diseases of the ear	23	808	1.5	1.3	1.8	1.0	2.7	1.5	1.4	1.6	1.2
Total diseases of the ear	161	5,691	10.4	9.0	12.9	10.9	14.9	10.5	10.2	10.8	1.2

(a) ICPC–2 codes: H00–H99. Acute otitis media/myringitis = H71; other ear infections = H70, H72, H73, H74; hearing loss = H28, H84, H85, H86; other diseases of the ear = H00–H27, H29–H69, H75–H83, H87–H99.

(b) Data from five combined BEACH years April 2004–March 2005 to April 2008–March 2009 inclusive.

(c) Data for Indigenous and other Australians have not been weighted.

(d) Data for Indigenous and other Australians have not been weighted.

(e) Per cent of total problems within age group.

(f) 'Other' includes non-Indigenous patients and patients for whom Indigenous status was not stated.

(g) Age-specific rate (no. per 100 encounters). Figures do not add to 100 as more than one problem can be managed at each encounter.

(h) LCL = lower confidence interval.

(i) UCL = upper confidence interval.

(j) Rate ratio Indigenous: other.

Source: AIHW analysis of BEACH survey of general practice AGPSCC.

Additional information

Ear and hearing problems among Aboriginal children in Western Australia

The Western Australian Aboriginal Child Health Survey collected information on ear and hearing problems among Aboriginal children living in Western Australia in 2001 and 2002 (Zubrick et al. 2004).

- Carers assessed approximately 18% of Aboriginal children as having recurring ear infections. Children aged 12–17 years were less likely to have recurring ear infections (14%) than younger children aged 0–3 and 4–11 years (20%). Of those children with recurring ear infections, over two-thirds (69%) had at least one episode in which infection ruptured the eardrum, causing ear discharge.
- Overall, approximately 13% of Aboriginal children aged 4–17 years had recurring ear infections with at least one instance of discharging ears, and a further 9% had had an isolated case of discharging ears. The risk of discharging ears in children with recurring ear infections was highest in areas of high and extreme isolation (83%).
- Carers of children aged 4–17 years were also asked about their child's hearing and learning ability. Approximately 7% of children were assessed as having abnormal hearing, 9% with unintelligible speech, 10% as having difficulty with sounds, 5% with a stammer and 9% as having learning difficulties. Younger children aged 4–11 years were more likely to have language difficulties such as unintelligible speech (11%) and difficulty with sounds (13%) than children aged 12–17 years (5% and 4% respectively).
- Aboriginal children with ear infections had a significantly greater risk of abnormal hearing, language problems and learning difficulties. Approximately 30% of children with recurrent ear infections with discharge had abnormal hearing compared with 2% of children with no ear infections. Children with recurring ear infections with discharge were around three times as likely to have difficulty with sounds and twice as likely to have learning difficulties as children with no ear infection.

Child hearing screening

Limited data are currently available on the screening of Aboriginal and Torres Strait Islander children's hearing in most states and territories. Available data are summarised below.

- In South Australia, in 2003, the prevalence of otitis media leading to hearing loss and contributing to communication problems and long-term disability was estimated to be 11.1% for Aboriginal children compared with 4.7% for the general community (SIMC 2004).
- In Victoria, all children are screened for hearing loss at 500 Hz at 30 dB and 1,000, 2,000 and 4,000 Hz at 20 dB through two universal programs – Maternal and Child Health (2–8 weeks) and School Nursing (prep year of school at age 5–6 years). In 2004, 58,793 prep children were screened, of whom 724 were recorded as Aboriginal and/or Torres Strait Islander. Of the Indigenous children screened, 598 were recorded with hearing within normal limits and 141 were referred for further action.
- In the Northern Territory in 2004, 62% of school-aged children (aged 4–16 years) tested in remote communities in the Northern Territory were identified with varying degrees of hearing loss in one or both ears. Audiologists and nurse audiometrists who travelled to remote communities performed the tests. The numbers tested included mostly children who failed hearing screening at school entry (aged 4–5 years) and children with hearing

concerns, but also older children who have had existing hearing loss and were being monitored.

Deadly Ears

Deadly Ears is a Queensland state-wide Aboriginal and Torres Strait Islander Ear Health Program targeting the prevention and management of ear disease and its associated impacts in Aboriginal and Torres Strait Islander children.

- In 2008–09, 56% of Indigenous children aged 0–4 years and 38% of Indigenous children aged 5–14 years reporting to Deadly Ears outreach clinics were assessed as having bilateral hearing loss (Table 1.12.13).
- In 2009, 40% of Indigenous children aged 0–4 years and 29% of Indigenous children aged 5–14 years reporting to Deadly Ears outreach clinics had otitis media (Table 1.12.14).

Table 1.12.13: Proportion of Deadly Ears program clients by level of hearing loss and age, 2008–2009

Year	Clients Number	Hearing within normal limits	Unilateral hearing loss Per cent	Bilateral hearing loss Per cent
		Per cent		
0–4 years				
2008	51	22.2	10.1	67.7
2009	89	32.9	15.5	51.5
Total	140	29.9	14.0	56.1
5–14 years				
2008	168	39.9	24.7	35.4
2009	324	41.3	19.6	39.1
Total	492	40.9	20.9	38.2

Source: Deadly Ears Program data.

Table 1.12.14: Proportion of Deadly Ears program clients with otitis media, by age, 2008–2009

Year	Clients Number	Chronic suppurative otitis media	Otitis media
		Per cent	Per cent
0–4 years			
2008	183	21.5	43.2
2009	230	24.0	39.5
5–14 years			
2008	394	19.0	24.7
2009	541	21.5	28.8

Source: Deadly Ears program data.

Data quality issues

National Aboriginal and Torres Strait Islander Health Survey (NATSIHS)

The NATSIHS uses the standard Indigenous status question. The NATSIHS sample was specifically designed to select a representative sample of Aboriginal and Torres Strait Islander Australians. It therefore overcomes the problem inherent in most national surveys with small and unrepresentative Indigenous samples. As with other surveys, the NATSIHS is subject to sampling and non-sampling errors. Calculations of standard errors and significance testing help to identify the accuracy of the estimates and differences.

Information recorded in this survey is essentially 'as reported' by respondents. The Australian Bureau of Statistics (ABS) makes every effort to collect accurate information from respondents, particularly through careful questionnaire design, pre-testing of questionnaires, use of trained interviewers and assistance from Indigenous facilitators. Nevertheless, imperfect recall or individual interpretation of survey questions may affect some responses.

Non-Indigenous comparisons are available through the National Health Survey (NHS). The NHS was conducted in *Major cities, Inner and outer regional areas* and *Remote and very remote areas*, but very remote areas were excluded from the sample. Time series comparisons are available through the 1995 and 2001 NHS.

In *Remote and very remote* communities there were some modifications to the NATSIHS content in order to accommodate language and cultural appropriateness in traditional communities and help respondents understand the concepts. Some questions were excluded and some reworded. Also, paper forms were used in communities in remote areas and computer-assisted interview (CAI) instruments were used in non-remote areas. The CAI process included built-in edit checks and sequencing.

Further information on NATSIHS data quality issues can be found in the NATSIHS 2004–05 publication (ABS 2006).

National Aboriginal and Torres Strait Islander Social Survey (NATSISS)

The NATSISS is conducted in all states and territories and includes remote and non-remote areas. The 2008 sample was 13,300 persons in 6900 households, with a response rate of 82% of households. Up to three randomly selected Indigenous people were chosen from selected households to participate in the survey. Trained ABS interviewers conducted the survey using face-to-face interviews. In non-remote areas interviewers used a notebook computer to record responses, while in remote areas a paper questionnaire was used. Interviewers obtained the consent of a parent or guardian before interviewing those aged 15 to 17 years. Indigenous persons usually resident in non-private dwellings such as hotels, motels, hostels, hospitals, short-stay caravan parks, prisons and other correctional facilities were excluded.

The NATSISS uses the standard Indigenous status question. The NATSISS sample was specifically designed to select a representative sample of Aboriginal and Torres Strait Islander Australians.

As with other surveys, the NATSISS is subject to sampling and non-sampling errors. Care has been taken to ensure that the results of this survey are as accurate as possible. Trained ABS officers conducted all the interviews. However, some factors may affect the reliability of the data.

Information recorded in this survey is 'as reported' by respondents, and therefore may differ from information available from other sources or collected using different methodologies.

Data on health-related indicators have been age-standardised to the 2001 total Australian population to account for differences in the age structures of the states and territories and the Indigenous and non-Indigenous population.

Time series comparisons for the 2008 survey are available through the 1994 National Aboriginal and Torres Strait Islander Survey and the 2002 NATSISS. However not all data elements align across the three (1994, 2001 and 2008) NATSISS surveys, hence care is required when reviewing results across the three surveys. There are no strictly comparable non-Indigenous results available for the 2008 NATSISS because the latest General Social Survey (which has been used in the past to compare with Indigenous results from the NATSISS) was run in 2006, with the next being run in 2010–11. Data from other ABS surveys run in 2008 may, however, be used to obtain rough non-Indigenous comparisons for some data items. Where possible, the ABS has provided recommendations for non-Indigenous data comparisons and these have been adopted in this report.

The 2008 NATSISS has a relatively large level of under-coverage when compared to other ABS surveys. There was also an increase in under-coverage compared to previous ABS Indigenous surveys. For example, the estimated under-coverage in the 2004–05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) was 42%. The overall under-coverage rate for the 2008 NATSISS is approximately 53% of the in-scope population at the national level. This rate varies across the states and territories (ABS 2010).

Further information on NATSISS data quality issues can be found in the 2008 NATSISS User's guide (ABS 2010).

Western Australian Aboriginal Child Health Survey

Survey data are subject to sampling and non-sampling errors. Confidence intervals are published with the data to provide a guide to the reliability of the estimates. Non-sampling errors can occur in surveys owing to questionnaire design problems, respondent difficulty recalling information/lack of appropriate records, and errors made in the recording and processing of the data. Every effort was made to minimise non-sample errors in this survey (Zubrick et al. 2004).

General practitioner data (BEACH)

Information about general practitioner (GP) encounters is available from the Bettering the Evaluation and Care of Health (BEACH) survey. The BEACH data on Indigenous Australians should be treated with care. First, the sample frame has not been designed to produce statistically significant results for population subgroups such as Indigenous Australians. Second, the identification of Indigenous Australians is not complete. In the BEACH survey, 'not stated' responses to the Indigenous identification question are often higher than the 'yes' responses. It can be assumed, therefore, that the survey consistently undercounts the number of Indigenous Australians visiting GPs, but the extent of this undercount is not measurable.

National Hospital Morbidity data

Hospital separations data

Separations

Differing admission practices among the jurisdictions and from year to year, and differing levels and patterns of service delivery can affect the number and pattern of hospitalisations.

The proportion of Aboriginal and Torres Strait Islander separations in public hospitals increased over the 11-year period 1996–97 to 2007–08, from 3.7% to 5.4%. In private hospitals, it stayed around 0.2% to 0.3% until 2003–04, when there was a modest increase to 0.5%.

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).

'Not stated' responses to the Indigenous status question were around 1% in public hospitals and 4% in private hospitals in 2007–08. This is a reduction from 1998–99 when 2% of responses in public hospitals and 8% of responses in private hospitals had a 'not stated' Indigenous status (AIHW 2009).

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 people. An estimated 89% of Indigenous patients were correctly identified in Australian public hospital admission records in 2007–08. In other words, 11% of Indigenous patients were not identified, and the 'true' number of hospital admissions for Indigenous persons was about 12% higher than reported.

For several years, Queensland, South Australia, Western Australia and the Northern Territory reported that Indigenous status in their hospital separations data were of acceptable quality (AIHW 2007). The AIHW, however, has recently completed an assessment of the level of Indigenous under-identification in hospital data in all states and territories. Results from this assessment indicate that New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory have adequate Indigenous identification (80% or higher overall levels of Indigenous identification in public hospitals only) in their hospital separations data. For Tasmania and the Australian Capital Territory, the levels of Indigenous identification were not considered acceptable for analysis purposes. It has therefore been recommended that reporting of Indigenous hospital separations data be limited to information from New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory, individually or in aggregate. The proportion of the Indigenous population that these six jurisdictions cover is 96%. The following caveats have also been recommended for analysis of hospitalisation data from selected jurisdictions (AIHW 2010):

- Interpretation of results should take into account the relative quality of the data from the jurisdictions included (currently a small degree of Indigenous under-identification in data from New South Wales and South Australia, and relatively marked Indigenous under-identification in data from Queensland and Victoria).
- Interpretation of time series analysis should take into account the possible contribution of changes over time in ascertainment of Indigenous status. This will be reflected in Indigenous patient changes in hospitalisation rates for Indigenous people.
- Data for these six jurisdictions over-represent Indigenous populations in less urbanised and more remote locations.
- Hospitalisation data for these six jurisdictions are not necessarily representative of other jurisdictions.

From the AIHW study, it was possible to produce correction factors for the level of Indigenous under-identification in hospital data for each jurisdiction and at the national level.

Remoteness areas

There were acceptable levels of Indigenous identification for all remoteness areas, ranging from 80% in *Major cities* to 97% in *Remote* and *Very remote* areas. The quality of data

supports analyses by remoteness areas, in aggregate, across states and territories. However, the sample size was insufficient to allow assessment of the quality of Indigenous identification by remoteness area within jurisdictions.

Numerator and denominator

Rate and ratio calculations rely on good numerator and denominator data. There are changes in the completeness of identification of Indigenous people in hospital records. These may take place at different rates from changes in the identification of Indigenous people in other administrative collections and population censuses. Denominators used in this analysis are sourced from *Experimental estimates and projections: Aboriginal and Torres Strait Islander Australians 1991 to 2021* (ABS 2009).

Data sources for injury emergency episodes

The National Non-admitted Patient Emergency Department Care Database is a national collection of de-identified data on emergency department episodes based on the Non-admitted Emergency Department Care National Minimum Data Set. This data set includes the standard Indigenous status question but does not include injury coding (for example, ICD-10). The Injury Surveillance National Minimum Data Set includes injury coding (components of ICD-10) but does not include demographic details such as Indigenous status. Therefore, there is currently no national minimum data set containing both Indigenous status and injury coding.

Deadly Ears

Deadly Ears clients report to outreach clinics after they have already been identified as having ear health issues through screening or referrals from other health services. Deadly Ears data do not necessarily reflect population-level hearing statistics for the communities they work with.

List of symbols used in tables

- n.a. not available
- rounded to zero (including null cells)
- 0 zero
- .. not applicable
- n.e.c. not elsewhere classified
- n.f.d. not further defined
- n.p. not available for publication but included in totals where applicable, unless otherwise indicated

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