

1.10 Decayed, missing and filled teeth

The number of decayed, missing and filled deciduous infant teeth (DMFT) and the number of decayed, missing and filled permanent adult teeth (DMFT) for Aboriginal and Torres Strait Islander people

Data sources

Data for this measure come from the AIHW Dental Statistics Research Unit (Child Dental Health Survey, Indigenous child oral health in remote communities study, and the National Survey of Adult Oral Health), the ABS 2004–05 National Aboriginal and Torres Strait Islander Health Survey, the Western Australian Aboriginal Child Health Survey and the AIHW National Hospital Morbidity Database.

Dental Health Survey Data—Child Dental Health Survey

The AIHW Dental Statistics Research Unit is responsible for a number of data collections in the areas of oral health, access to dental care and dental health services.

Data on children's dental health come from the Child Dental Health Survey, a national survey which monitors the dental health of children enrolled in school dental services that health departments in all states and territories operate. The latest report describes and discusses the survey and presents analyses for the combined years 2003–04. The data covers more than a quarter of a million children from all states and territories except for New South Wales.

The Indigenous status of both child and mother are considered to be two items important to a health monitoring survey. Both items were obtained from information on the patient's treatment card or medical history. However, due to the increasingly limited recording of this information by the state and territory school dental services, they were not included in the 2003–04 report.

The Oral health of Aboriginal and Torres Strait Islander children measure states that data from a total of 341,195 children were included in the analyses: 11,017 (3.2%) Indigenous children and 330,178 (96.8%) non-Indigenous children. The highest proportion of Aboriginal and Torres Strait Islander children was observed in the three-year-old category (6.8%).

Study of Aboriginal and Torres Strait Islander child oral health in remote communities

Indigenous child oral health data were collected from remote Indigenous communities in all jurisdictions in the 2000–2003 period, as part of a study undertaken by the Australian Research Centre for Population Oral Health (ARCPOH). The study collaborated with the Far West Area Health Service (New South Wales), the remote Indigenous communities of Nganampa lands (South Australia), and various remote communities around Alice Springs (Northern Territory). Dental health professionals providing services to these communities collected the data. (Because of issues of confidentiality, specific location details were unable to be included in the analysis.)

Data were gathered in terms of sociodemographic information (age, sex, and Indigenous status), self-care habits (tooth brushing at home and school), dental disease experience, gingivitis and caries risk status, and fluorosis and hypoplasia levels.

National Survey of Adult Oral Health

The 2004–06 National Survey of Adult Oral Health is the second national oral examination survey of Australians which included telephone interviews with 14,123 people aged 15–97 years, 5,505 of whom were also dentally examined. The survey included 229 people who identified as Aboriginal or Torres Strait Islander (1.6%). The survey collected information on levels of oral disease, perceptions of oral health and patterns of dental care within a representative cross-section of adults in all states and territories of Australia. The first survey (the National Oral Health Survey of Australia) was conducted in 1987–88 and did not collect information on Indigenous status.

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 issues of 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).

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 the 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.

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 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, 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 2-year period from July 2006 to June 2008. An aggregate of 2 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. 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 the 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.

Northern Territory Emergency Response Child Health Check Initiative

The Northern Territory Emergency Response Child Health Check Initiative (NTER CHCI) section in this indicator is produced based on the data that were collected from the Closing the Gap Program in the Northern Territory Dental Program.

This program was introduced as a follow-up to the Child Health Check Initiative (CHCI), which is one component of the health-related measures introduced under the Northern Territory Emergency Response (NTER). Oral health was identified as a major health problem during the health checks and children were provided with referrals for dental services. The Australian Government extended its CHCI funding to the Northern Territory Department of Health and Families (NT DHF) and six Aboriginal Community Controlled Health Organisations (ACCHOs) to provide eligible children with follow-up dental services.

This indicator presents the number of dental services that were provided to the Indigenous children in the prescribed areas through this program by 30 June 2009. It also describes the demographic characteristics of those children who participated in this program.

National Aboriginal and Torres Strait Islander Social Survey

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.

Analyses

Age-standardised rates and ratios have been used 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.

Decayed, missing and filled teeth

Oral health outcomes are usually measured in terms of the number of decayed, missing or filled (DMFT) baby (deciduous) and adult (permanent) teeth (AIHW 2000). The DMFT score measures decay experience in deciduous and permanent teeth. Another measure of good oral health is the proportion of children with no tooth decay.

Data on decayed, missing and filled teeth for Indigenous children and adults come from the Child Dental Health Survey and the National Survey of Adult Dental Health and are presented below.

Children

Data on decay in deciduous and permanent teeth are presented below for Indigenous children in New South Wales, South Australia and the Northern Territory. Data for New South Wales are for 2000, for South Australia they are for 2003 and for the Northern Territory they are for 2002.

Deciduous teeth

Mean DMFT

- In New South Wales, South Australia and the Northern Territory, the mean number of decayed, missing or filled deciduous teeth for Indigenous children aged 4–10 years was higher than for non-Indigenous children at all ages (Table 1.10.1, Figure 1.10.1).
- Of all children with decayed, missing or filled deciduous teeth, both Indigenous and non-Indigenous children were most likely to have decayed teeth, followed by filled teeth.
- The mean numbers of decayed or missing teeth were highest among those aged less than 7 years, whereas the mean number of filled teeth was highest among those aged 7 years and over.

- Children in New South Wales had lower mean numbers of decayed or filled teeth than children in South Australia and the Northern Territory. One possible explanation for this is the different type of dental examination used in New South Wales, where a screening is undertaken rather than a clinical examination as used in other states and territories.
- Indigenous children in the Northern Territory had much higher mean numbers of decayed teeth than Indigenous children in South Australia and New South Wales, whereas for non-Indigenous children, scores were similar across jurisdictions.

Table 1.10.1: Mean number of decayed, missing or filled deciduous teeth, children aged 4–10 years, by Indigenous status, NSW (2000), SA (2003) and NT (2002)

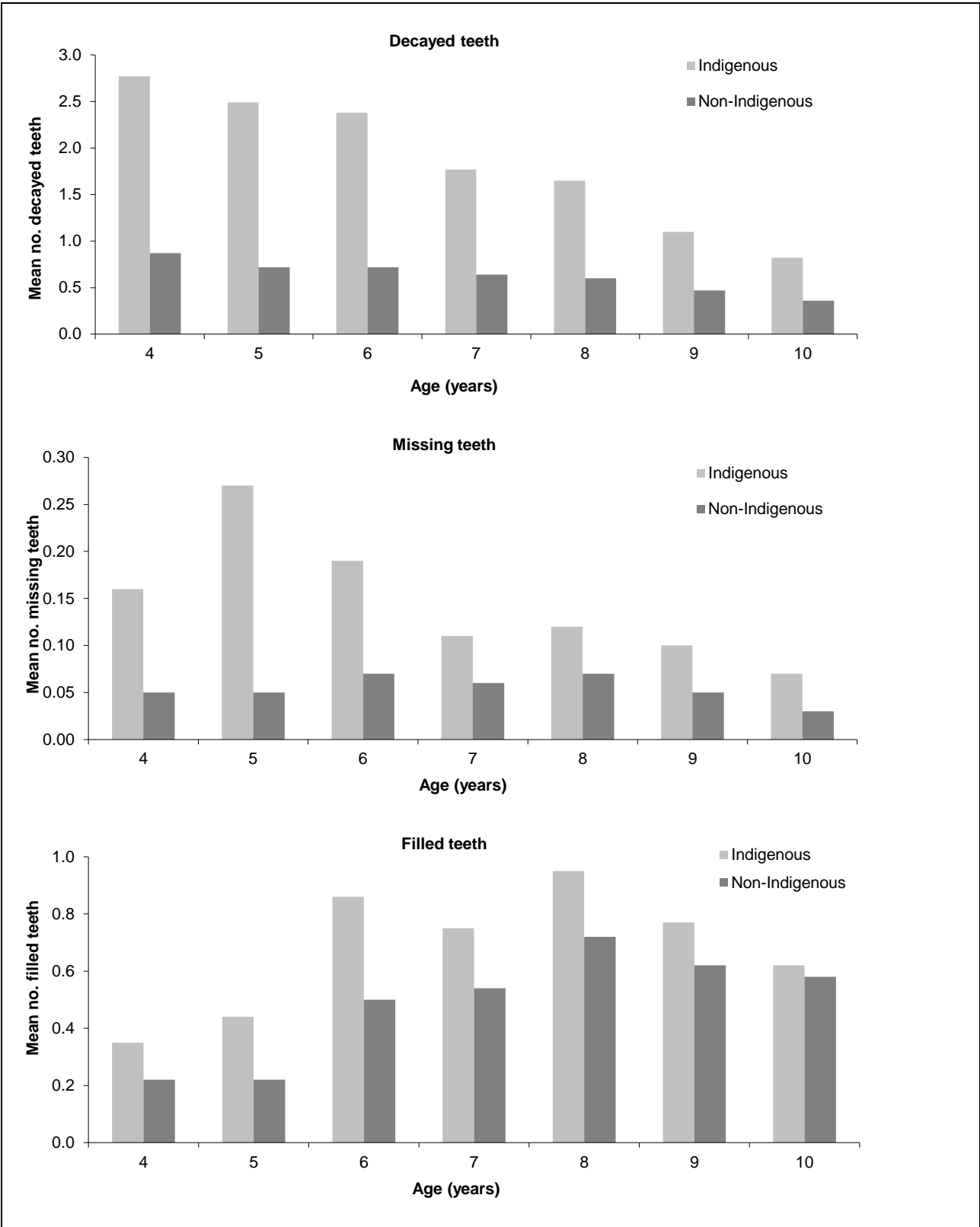
Age	New South Wales		South Australia		Northern Territory		NSW, SA & NT	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
Decayed (d)								
4	1.90*	0.79*	2.48*	0.96*	3.07*	0.82*	2.77*	0.87*
5	1.64*	0.69*	2.11*	0.89*	3.62*	0.92*	2.49*	0.72*
6	1.36*	0.65*	2.10*	0.89*	3.10*	0.85*	2.38*	0.72*
7	1.05*	0.62*	1.54*	0.78*	2.90*	0.73*	1.77*	0.64*
8	0.98*	0.56*	1.22*	0.67*	2.19*	0.67*	1.65*	0.60*
9	0.74*	0.45*	1.27*	0.60*	1.54*	0.54*	1.10*	0.47*
10	0.43*	0.32*	0.58*	0.44*	1.17*	0.38*	0.82*	0.36*
Missing (m)								
4	^(b) 0.16*	^(a) 0.04*	^(a) 0.33*	0.06*	^(a) 0.11	^(a) 0.05	^(a) 0.16*	0.05*
5	0.33*	0.04*	0.35*	0.09*	^(a) 0.15*	0.05*	0.27*	0.05*
6	^(a) 0.16*	0.05*	^(a) 0.31*	0.10*	^(a) 0.15*	^(a) 0.05*	0.19*	0.07*
7	^(a) 0.12*	0.068	^(a) 0.21*	0.08*	0.08	0.06	0.11*	0.06*
8	0.13*	0.06*	^(a) 0.24*	0.08*	^(a) 0.07	0.09	0.12*	0.07*
9	0.10*	0.048	^(a) 0.07	0.06	0.09	0.09	0.10*	0.05*
10	0.05	0.03	^(b) 0.05	0.03	^(a) 0.08	0.05	0.07*	0.03*
Filled (f)								
4	^(a) 0.36*	0.15*	^(a) 0.58*	0.30*	0.26	0.19	0.35*	0.22*
5	0.30*	0.17*	1.18*	0.51*	0.32*	0.43*	0.44*	0.22*
6	0.57*	0.32*	1.54*	0.94*	0.69	0.76	0.86*	0.50*
7	0.57*	0.43*	1.45*	1.17*	0.72*	0.93*	0.75*	0.54*
8	0.68*	0.49*	1.81*	1.25*	0.76*	1.08*	0.95*	0.72*
9	0.51*	0.498	1.68*	1.29*	0.76*	1.08*	0.77*	0.62*
10	0.49*	0.40*	1.29	1.45	0.44*	0.70*	0.62	0.58*
Decayed, missing & filled (DMFT)								
4	2.42*	0.98*	3.39*	1.32*	3.44*	1.06*	3.41*	1.33*
5	2.27*	0.90*	3.64*	1.49*	4.09*	1.40*	3.66*	1.31*
6	2.09*	1.02*	3.95*	1.93*	3.94*	1.66*	3.68*	1.54*
7	1.74*	1.11*	3.20*	2.03*	3.70*	1.72*	2.94*	1.54*
8	1.79*	1.11*	3.27*	2.00*	3.02*	1.84*	2.91*	1.60*
9	1.35*	0.98*	3.02*	1.95*	2.39*	1.71*	2.17*	1.34*
10	0.97*	0.75*	1.92	1.92	1.69*	1.13*	1.60*	1.09*

* Statistically significant differences in the Indigenous/non-Indigenous comparisons.

(a) Estimate has a relative standard error of 25% to 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.

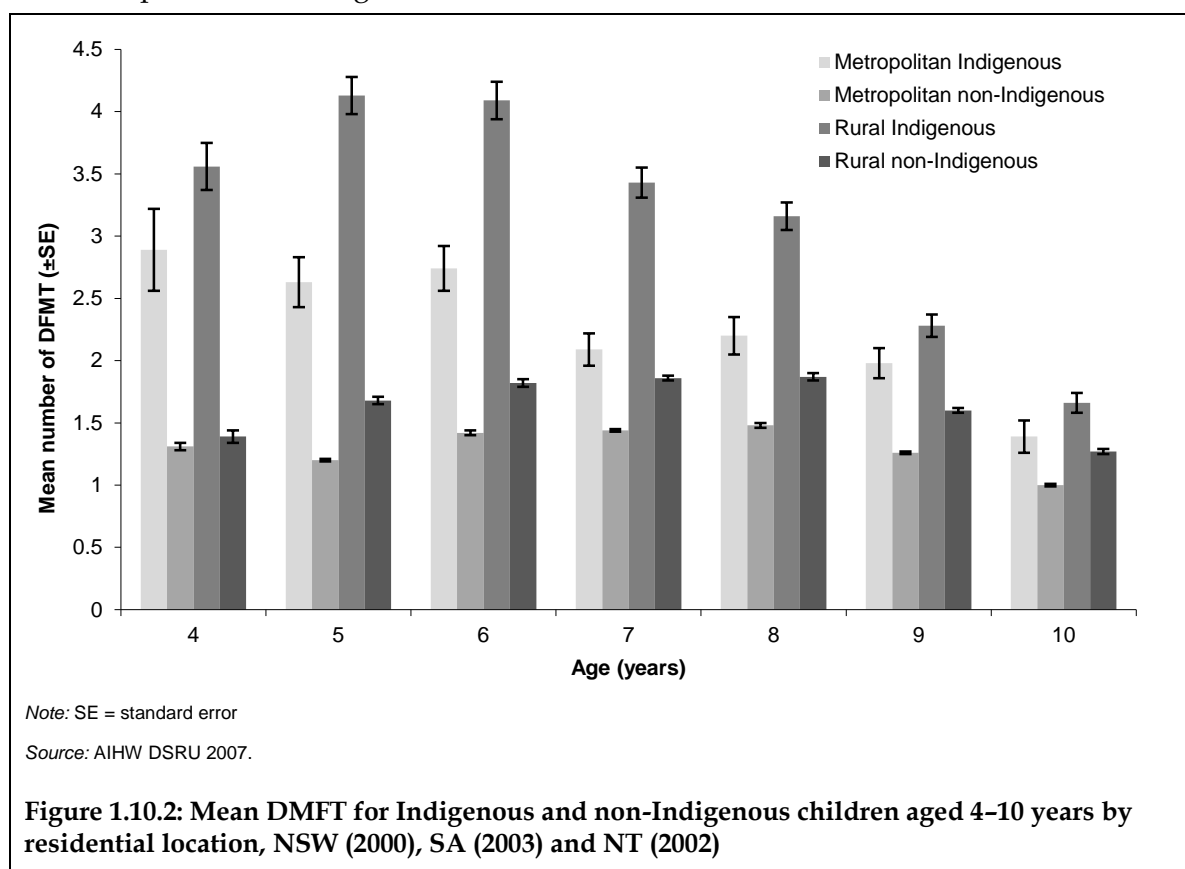
Source: AIHW Dental Statistics Research Unit.



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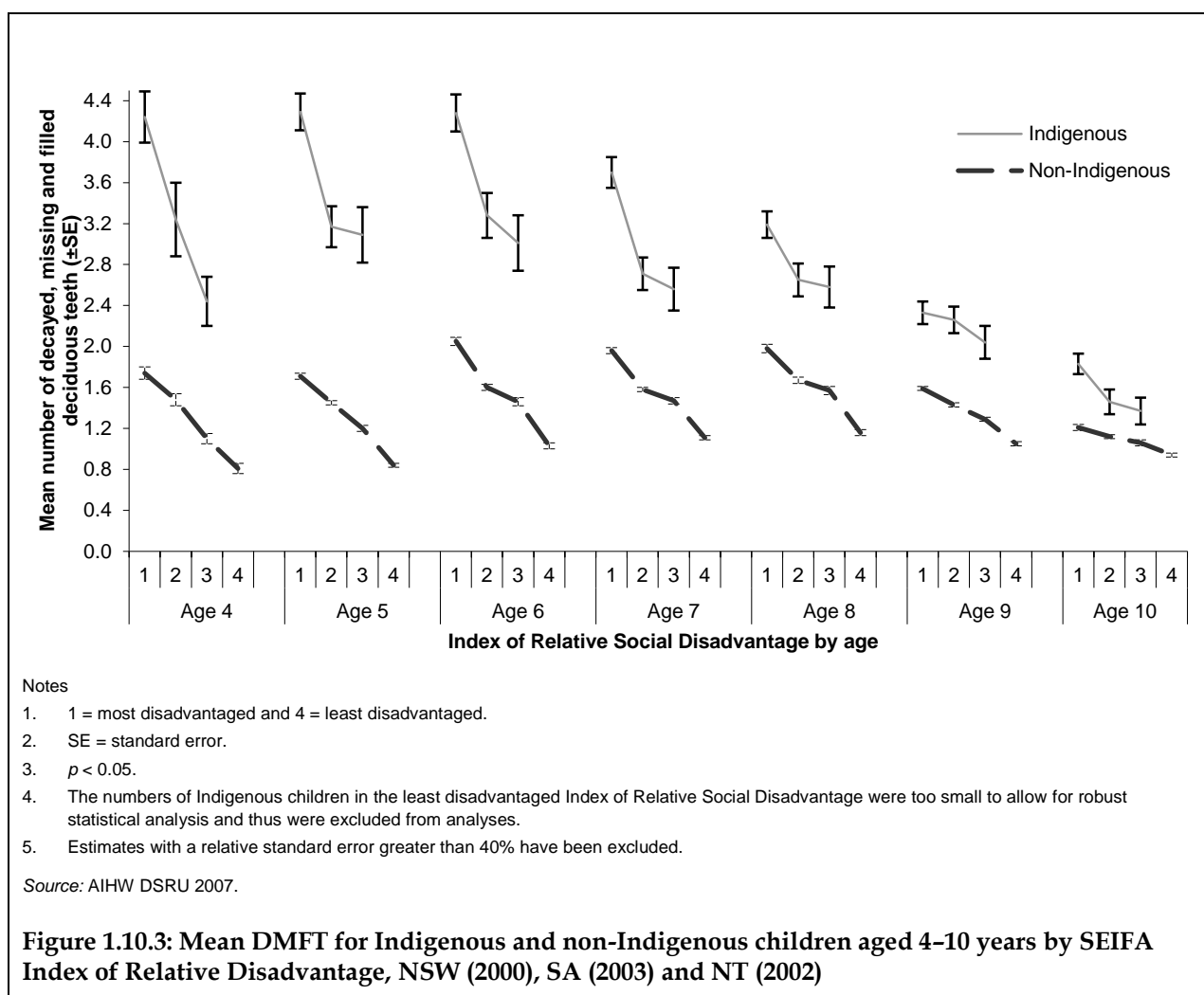
Figure 1.10.1: Mean number of decayed, missing or filled deciduous teeth, children aged 4-10 years, by Indigenous status, NSW (2000), SA (2003) and NT (2002)

- The mean DMFT of children aged 4–10 years by residential location is presented in Figure 1.10.2. In all age groups rural Indigenous children had the highest mean DMFT levels, followed by metropolitan Indigenous children, rural non-Indigenous children and metropolitan non-Indigenous children.



The mean DMFT of Indigenous and non-Indigenous children aged 4–10 years by the SEIFA Index of Relative Disadvantage is presented in Figure 1.10.3.

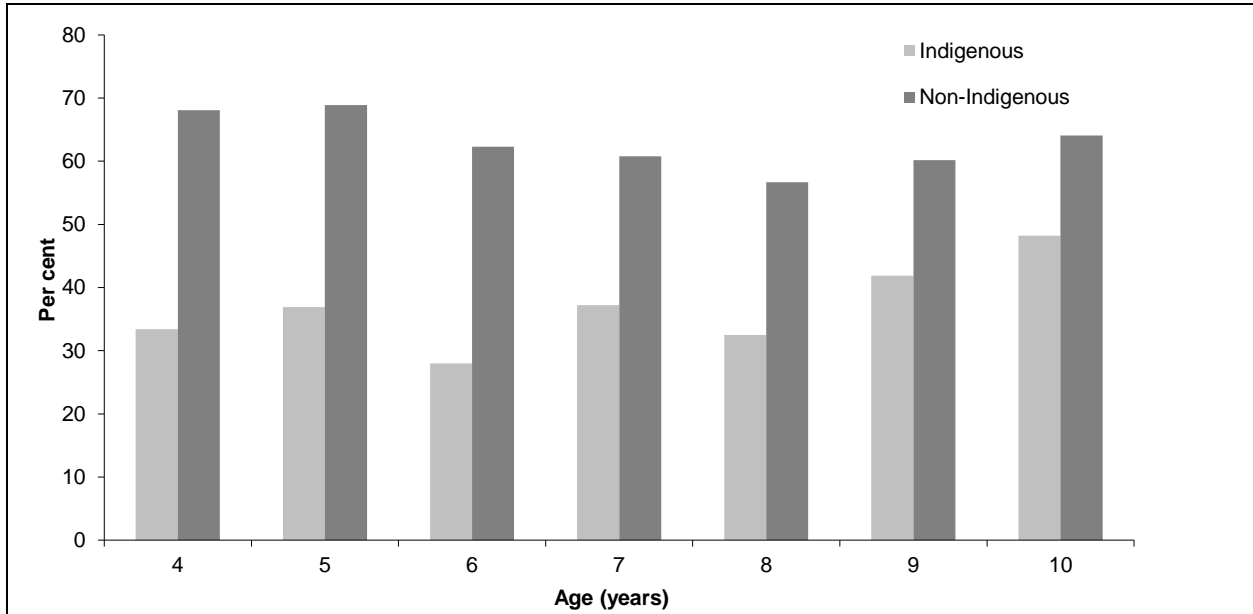
- Indigenous children across all age groups had higher DMFT than non-Indigenous children, and Indigenous children in the most disadvantaged category had higher DMFT than Indigenous children who were less disadvantaged.
- Indigenous children aged 4–6 years from disadvantaged areas had the highest DMFT scores, and this was around 2.5 times the DMFT of non-Indigenous children aged 4–6 years from disadvantaged areas.
- The DMFT difference among Indigenous and non-Indigenous children decreased with increasing age, although across all age groups the DMFT of Indigenous children from the most advantaged areas was less than the DMFT of non-Indigenous children from the most disadvantaged areas.



DMFT = 0

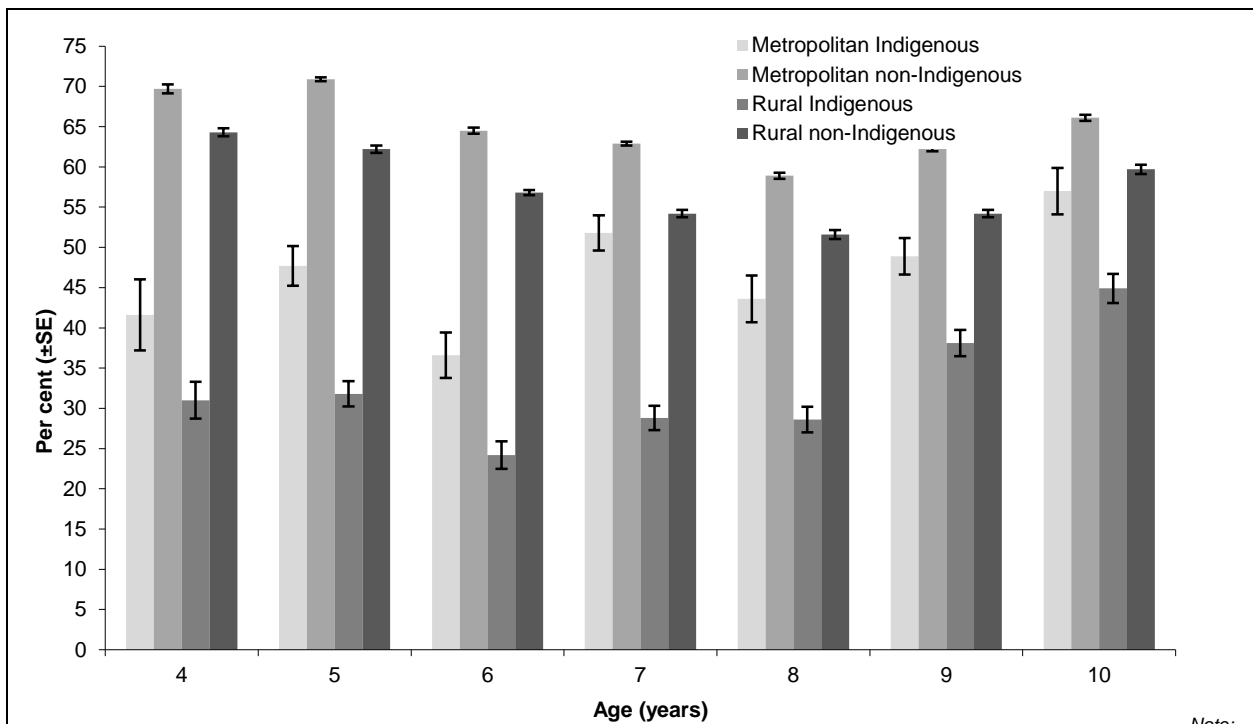
- At all ages, the proportion of Indigenous children in New South Wales, South Australia and the Northern Territory free of caries in their deciduous teeth ($DMFT = 0$) was lower than the proportion for non-Indigenous children. At age 6 years, twice as many non-Indigenous children had no clinical deciduous caries experience (62.3%) than Indigenous children (28.0%) (Figure 1.10.4).

The proportion of children aged 4–10 years with $DMFT = 0$ by residential location is presented in Figure 1.10.5. Across all age groups a higher proportion of metropolitan non-Indigenous children had no evidence of dental disease experience in their deciduous teeth, followed by rural non-Indigenous children, metropolitan Indigenous children and rural Indigenous children respectively.



Source: AIHW Dental Statistics Research Unit.

Figure 1.10.4: Proportion of children aged 4–10 years with no decayed, missing or filled deciduous teeth (DMFT = 0), by age and Indigenous status, NSW (2000), SA (2003) and NT (2002)



SE = standard error.

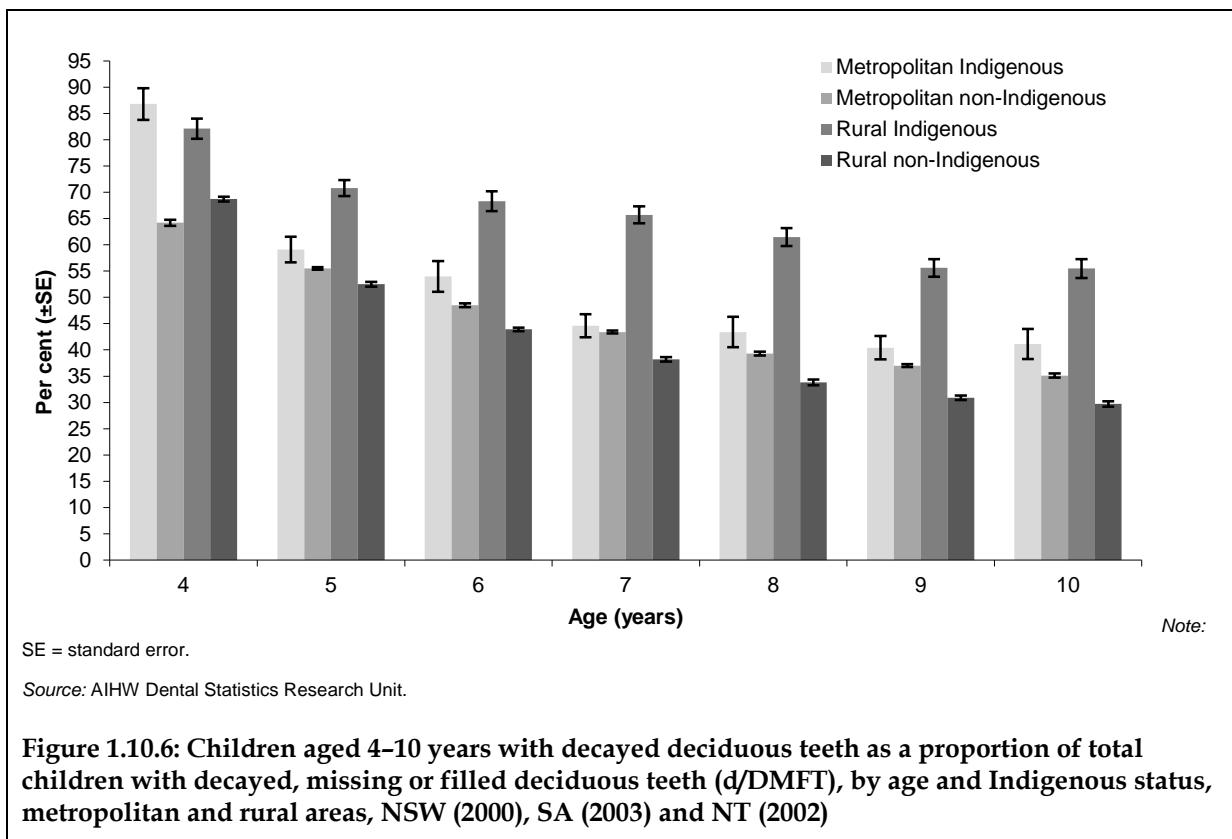
Source: AIHW DSRU 2007.

Note:

Figure 1.10.5: Proportion of Indigenous and non-Indigenous children aged 4–10 years with DMFT = 0 by residential location, NSW (2000), SA (2003) and NT (2002)

d/DMFT

- The *d/DMFT* ratio refers to the proportion of untreated teeth with decay in the population. It shows that Indigenous children have a greater unmet need for dental treatment than non-Indigenous children. Indigenous children had higher levels of untreated decay as a percentage of total caries experience than non-Indigenous children across all age groups, with the difference between rural Indigenous and rural non-Indigenous children becoming more marked with increasing age (Figure 1.10.6). Across all age groups, with the exception of 4-year-olds, rural Indigenous children had markedly higher proportions of *d/DMFT* than their metropolitan and non-Indigenous counterparts.



Permanent teeth

Mean DMFT

- In New South Wales, South Australia and the Northern Territory, the mean numbers of decayed and filled permanent teeth for Indigenous children aged 6–15 years were higher than for non-Indigenous children at all ages except at age 15 years for filled teeth (Table 1.10.2, Figure 1.10.7). Data are not presented separately for missing permanent teeth because of low numbers.
- As with deciduous teeth, children in New South Wales had lower mean numbers of decayed or filled permanent teeth than children in South Australia and the Northern Territory.
- Indigenous children in the Northern Territory had the highest mean number of decayed teeth, whereas Indigenous children in South Australia had the highest mean number of filled teeth.

Table 1.10.2: Mean number of decayed, missing and filled permanent teeth for children aged 6–15 years, by age and Indigenous status, NSW (2000), SA (2003) and NT (2002)

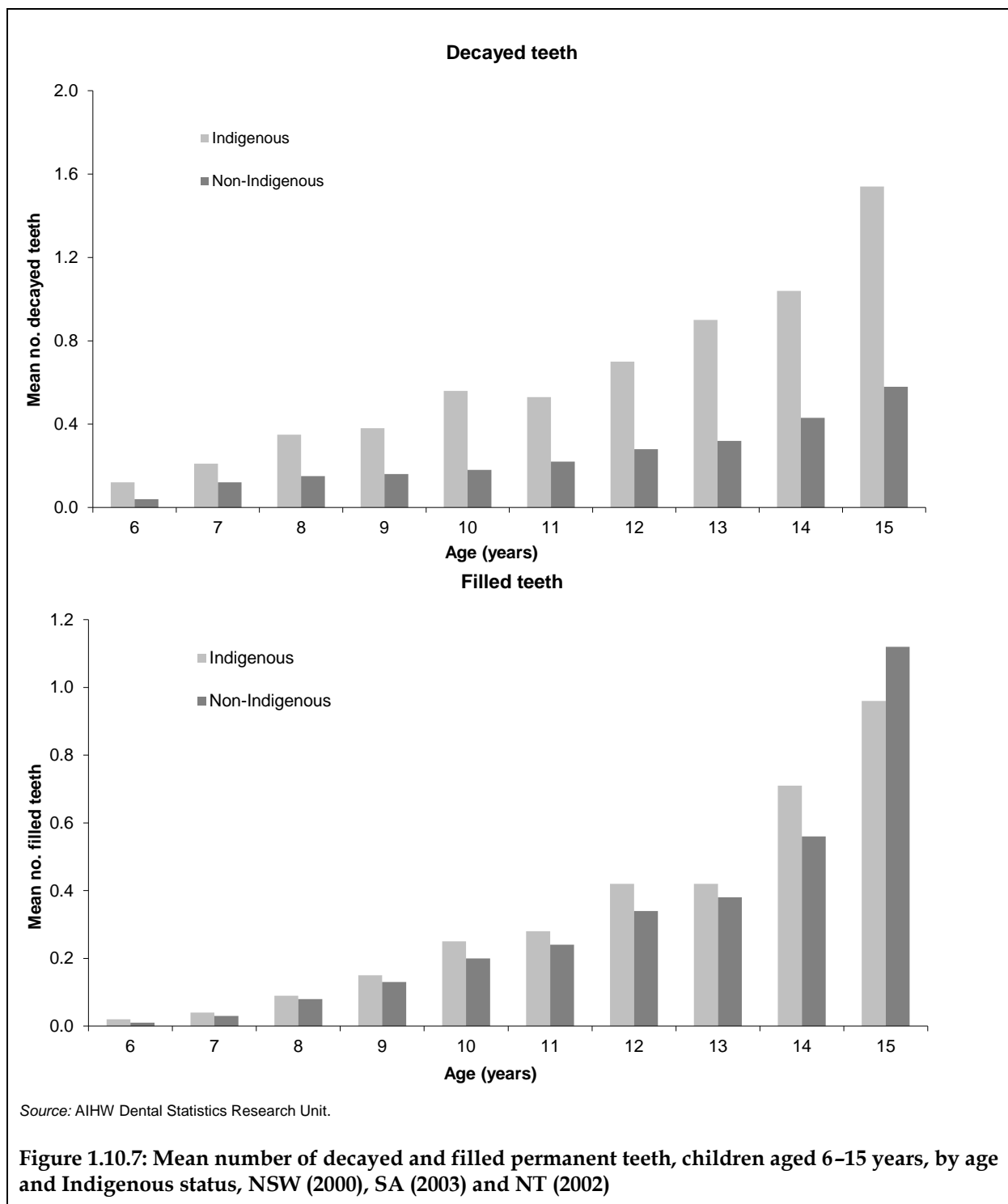
Age	New South Wales		South Australia		Northern Territory		NSW, SA & NT	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
Decayed (D)								
6	0.09*	0.03*	0.14*	0.06*	0.12*	0.06*	0.12*	0.04*
7	0.17*	0.12*	0.30*	0.17*	0.25*	0.12*	0.21*	0.12*
8	0.29*	0.13*	0.39*	0.18*	0.40*	0.12*	0.35*	0.15*
9	0.29*	0.15*	0.53*	0.19*	0.45*	0.14*	0.38*	0.16*
10	0.37*	0.16*	0.51*	0.21*	0.69*	0.17*	0.56*	0.18*
11	0.36*	0.21*	0.55*	0.24*	0.72*	0.21*	0.53*	0.22*
12	0.54*	0.26*	0.59*	0.31*	0.78*	0.25*	0.70*	0.28*
13	0.66*	0.31*	1.00*	0.41*	1.45*	0.25*	0.90*	0.32*
14	0.82*	0.38*	1.24*	0.50*	1.24	^(a) 0.74	1.04*	0.43*
15	n.a.	n.a.	1.59*	0.54*	^(a) 1.31*	^(b) 0.48*	1.54*	0.58*
Filled (F)								
6	^(b) 0.01	0.01	^(b) 0.03	0.01	^(b) 0.01	0.01	0.02	0.01
7	^(a) 0.03	0.03	^(a) 0.06	0.06	^(a) 0.04	^(a) 0.04	0.04	0.03
8	^(a) 0.06	0.06	^(a) 0.13	0.14	^(a) 0.08	0.08	0.09	0.08
9	0.11	0.10	0.33	0.27	0.15	0.18	0.15*	0.13*
10	0.22*	0.13*	0.47*	0.35*	0.19	0.21	0.25*	0.20*
11	0.25*	0.20*	0.55*	0.43*	0.21*	0.29*	0.28*	0.24*
12	0.33	0.27	0.67*	0.48*	0.32	0.39	0.42*	0.34*
13	0.34	0.32	0.78	0.66	^(a) 0.36	0.41	0.42	0.38
14	0.45	0.39	1.12*	0.81*	^(a) 0.43	^(b) 0.77	0.71*	0.56*
15	n.a.	n.a.	1.18	1.14	^(b) 0.11	^(b) 0.39	0.96	1.12
Decayed, missing & filled (DMFT)								
6	^(a) 0.11*	0.04*	0.17*	0.07*	0.13*	0.07*	0.16*	0.06*
7	0.21*	0.15*	0.36*	0.22*	0.29*	0.16*	0.31*	0.22*
8	0.36*	0.20*	0.53*	0.32*	0.49*	0.20*	0.51*	0.29*
9	0.42*	0.26*	0.87*	0.47*	0.61*	0.32*	0.64*	0.38*
10	0.61*	0.30*	1.09*	0.57*	0.93*	0.40*	0.94*	0.46*
11	0.63*	0.43*	1.11*	0.68*	0.99*	0.52*	0.96*	0.59*
12	0.87*	0.54*	1.28*	0.80*	1.13*	0.71*	1.25*	0.75*
13	1.03*	0.65*	1.83*	1.09*	1.87*	0.78*	1.62*	0.90*
14	1.37*	0.81*	2.43*	1.34*	1.87	^(a) 1.51	2.09*	1.18*
15	n.a.	n.a.	2.79*	1.73*	^(a) 1.60	^(b) 0.86	2.65*	1.80*

* Statistically significant differences in the Indigenous/non-Indigenous comparisons.

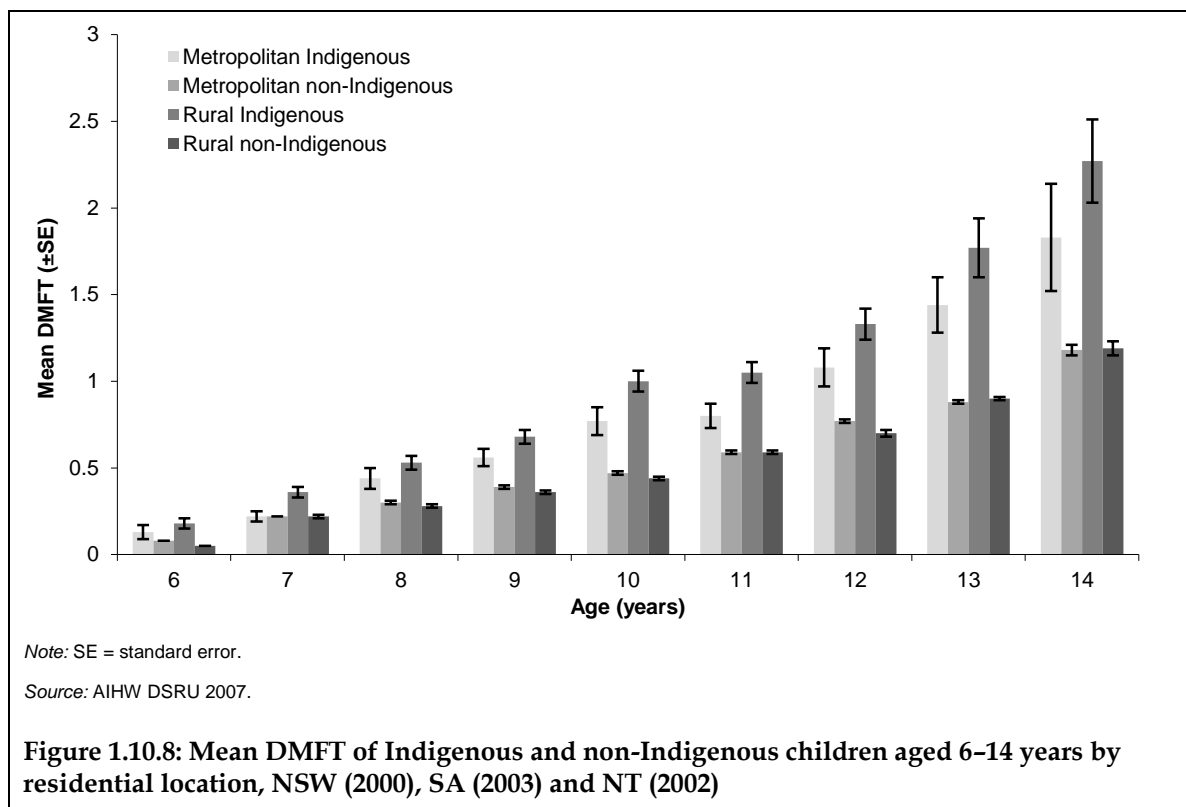
(a) Estimate has a relative standard error of 25% to 50% and should be used with caution.

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

Source: AIHW Dental Statistics Research Unit.

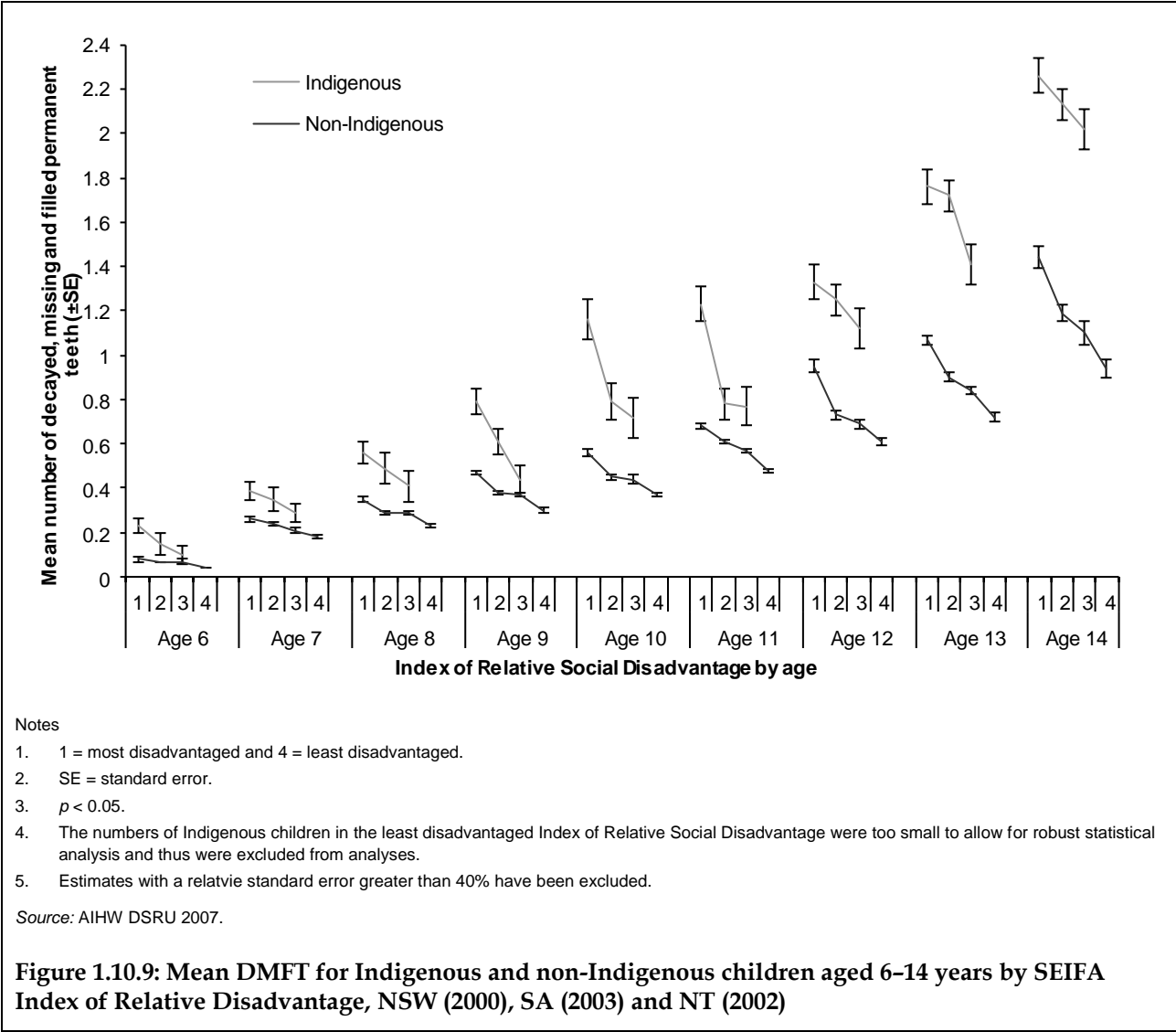


- The mean DMFT of Indigenous and non-Indigenous children aged 6–14 years by residential location is presented in Figure 1.10.8. Indigenous children had higher DMFT than non-Indigenous children across all age groups except metropolitan children aged 7 years, with the difference becoming more marked with increasing age. Across all age groups, rural Indigenous children had greater DMFT than their metropolitan counterparts but rural and metropolitan non-Indigenous DMFT levels were relatively similar. The mean DMFT increased with increasing age for all children, with the steepest gradient occurring among rural Indigenous children.



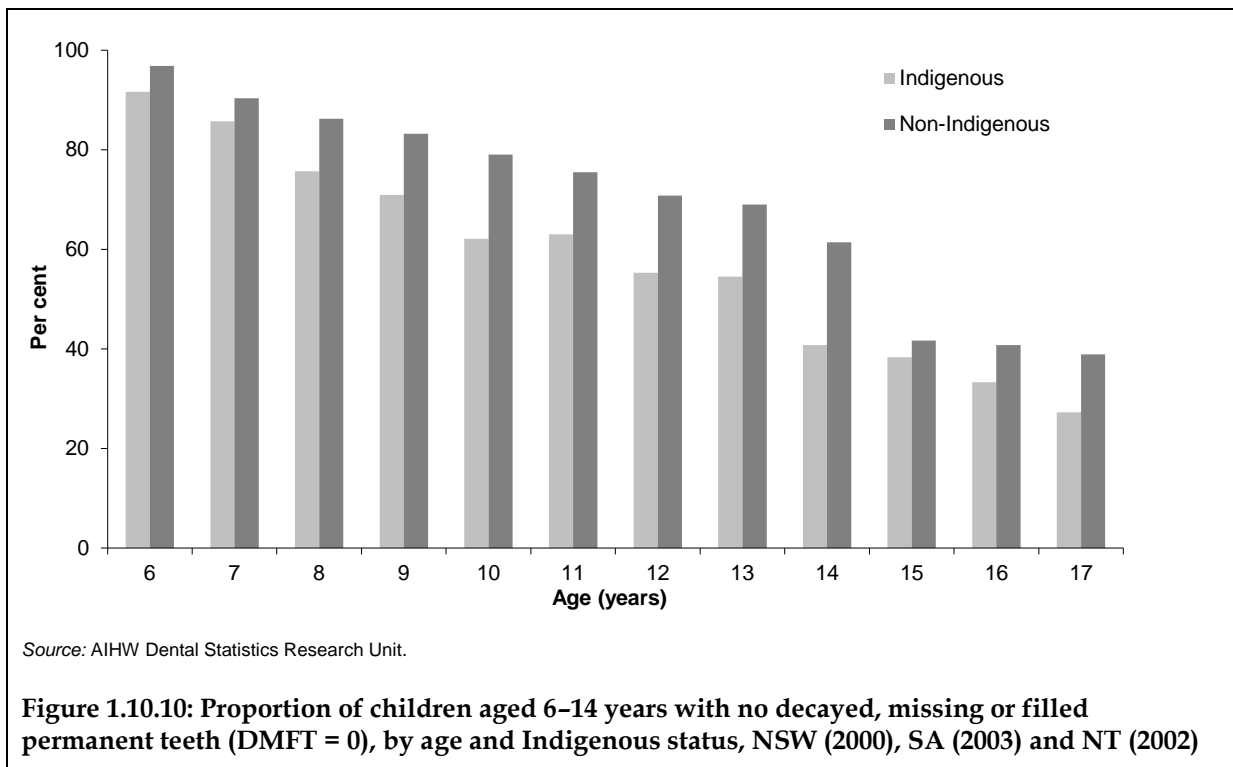
The mean DMFT of Indigenous and non-Indigenous children aged 6–14 years by the SEIFA Index of Relative Disadvantage is presented in Figure 1.10.9.

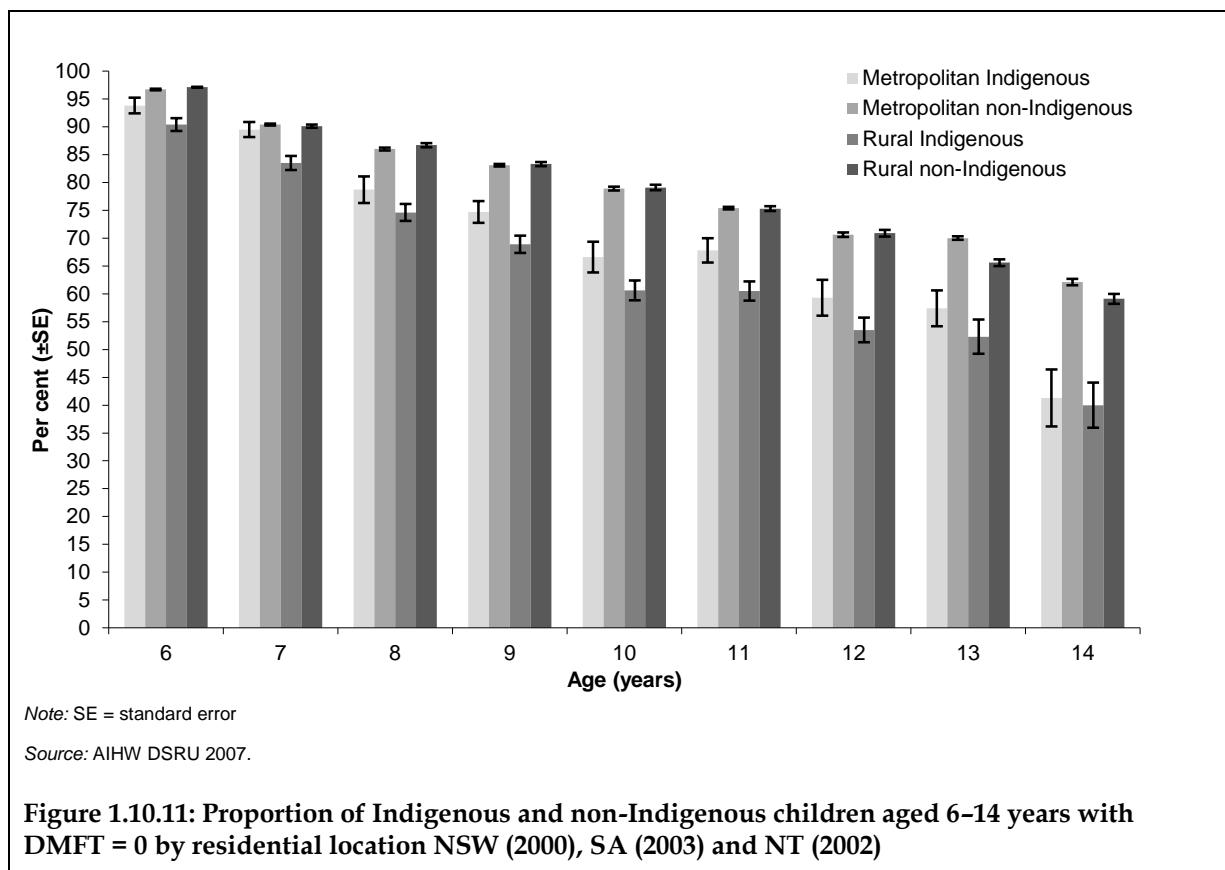
- Across all age groups, Indigenous children had higher DMFT than non-Indigenous children and this difference increased with increasing age. Indigenous and non-Indigenous children in the most disadvantaged SES category had higher DMFT than their counterparts in more advantaged categories across all age groups, with mean DMFT decreasing with increasing social advantage.
- The highest DMFT was observed among Indigenous children aged 14 years in the most disadvantaged category, and this was 1.6 times the DMFT of similarly disadvantaged non-Indigenous children aged 14 years.
- The greatest DMFT difference among disadvantaged Indigenous and non-Indigenous children was observed among those aged 10 years (Indigenous children aged 10 years from disadvantaged areas had 2.1 times the DMFT of their non-Indigenous counterparts from disadvantaged areas). Across all age groups, except six and nine years, Indigenous children in the least disadvantaged categories had higher DMFT than the most disadvantaged non-Indigenous children.



DMFT = 0

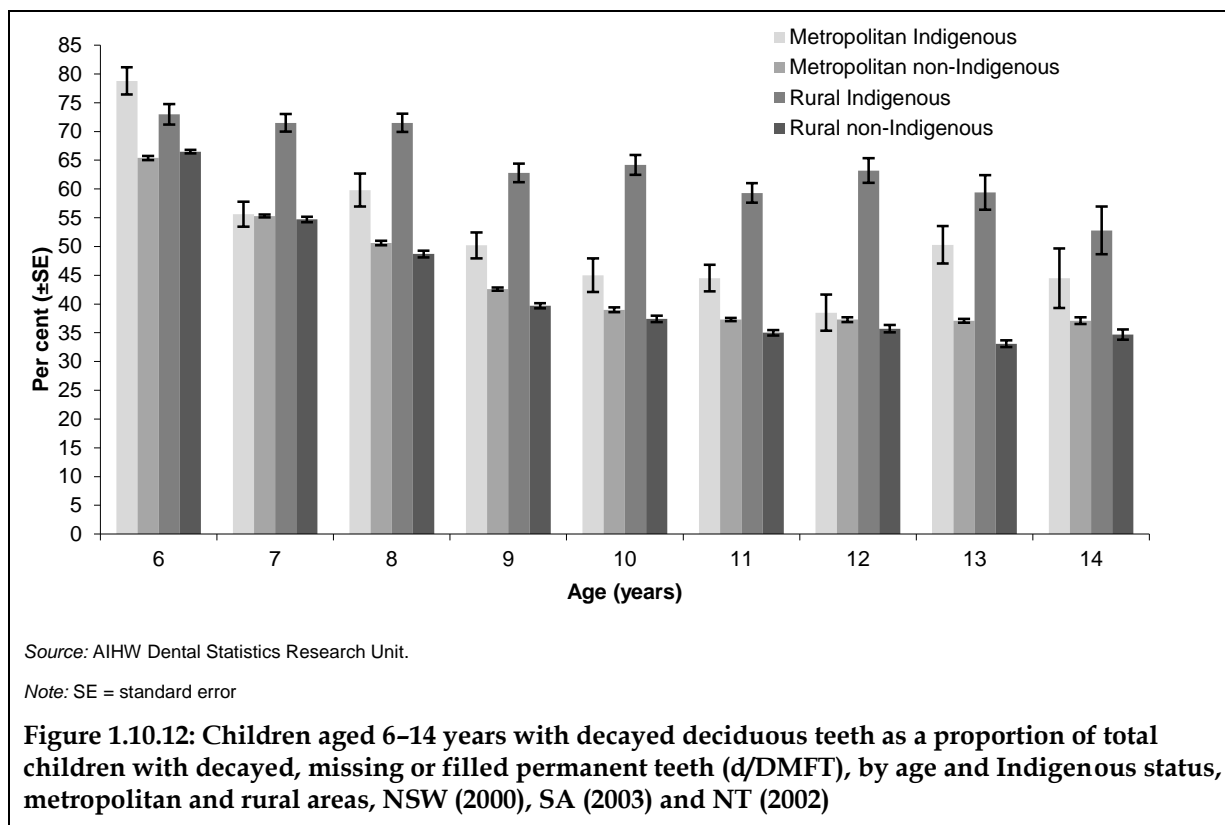
- The proportion of Indigenous children in New South Wales, South Australia and the Northern Territory free of caries in their permanent teeth decreased with increasing age. At each age level, fewer Indigenous children had no caries experience than non-Indigenous children, but the differences between Indigenous and non-Indigenous children in the proportion with no clinical caries experience was less marked than with their deciduous teeth (Figure 1.10.10).
- Across all age groups the proportion of children with no evidence of dental disease experience in their permanent teeth was highest among metropolitan and rural non-Indigenous groups, followed by metropolitan Indigenous children and rural Indigenous children respectively (Figure 1.10.11). The highest proportion of children who were caries-free in their permanent teeth were metropolitan and rural non-Indigenous children aged 6 years. The proportion of children with DMFT = 0 generally decreased with increasing age across Indigenous and non-Indigenous groups, with the trend being most marked among rural and metropolitan Indigenous children.





d/DMFT

- At all ages between 6 and 14 years, there was a higher proportion of Indigenous children in rural areas with untreated permanent decayed teeth as a percentage of those with decayed, missing or filled teeth (*d/DMFT*) than non-Indigenous children in rural areas (Figure 1.10.12). This was also the case in metropolitan areas for most ages, but the differences between Indigenous and non-Indigenous children with untreated permanent decayed teeth were not as marked as in rural areas.



DMFT and DMFT scores of Indigenous children in remote communities

Data on the oral health of Indigenous children in remote communities come from a study undertaken in 2000–2003 by the Australian Research Centre for Population Oral Health in collaboration with the Far West Area Health Service (New South Wales), the remote Indigenous communities of Nganampa lands (South Australia), and various remote communities around Alice Springs (Northern Territory). There was a total of 831 children in the sample, whose ages ranged from 2 to 16 years.

The mean DMFT and DMFT scores of Indigenous children in remote locations by age group are presented in Table 1.10.3. Overall, the mean DMFT for Indigenous children aged 2–16 years was 4.03 and the mean DMFT score was 1.06.

Indigenous children aged under 5 years and aged 5–9 years had higher mean DMFT than those in older age groups (3.69 to 6.27 compared with 0.08 to 1.99). In contrast, older children had higher mean DMFT scores than their younger counterparts. Indigenous children aged 15–16 years had mean DMFT scores of 3.67 compared with 0.55 and 1.62 for Indigenous children aged 5–9 years and 10–14 years respectively.

Table 1.10.3: Mean DMFT and DMFT scores of remote Indigenous children, by age group, 2000–2003

	Age group				All children (2–16 years)
	<5 years	5–9 years	10–14 years	15–16 years	
Mean DMFT	3.69	6.27	1.99	0.08	4.03
Mean DMFT score	—	0.55	1.62	3.67	1.06

Source: AIHW DSRU 2007.

Comparison of remote Indigenous child oral health and state/territory and national dental disease levels

A comparison of caries experience of remote Indigenous children compared with children in South Australia, the Northern Territory and total Australia is shown in Table 1.10.4.

Dental disease experience in primary teeth was greater for remote Indigenous children (DMFT = 2.94 for 5–6 years) compared with children in South Australia, the Northern Territory and total Australia (DMFT = 1.46 to 2.26 for 5–6 years). The proportion of children with caries in both deciduous and permanent teeth was greater for children living in remote Indigenous communities.

Table 1.10.4: Caries experience of remote Indigenous children compared with South Australia, the Northern Territory and total Australia child populations

Population	DMFT (5–6 years)	Per cent DMFT > 0	DMFT (> 12 years old)	Per cent DMFT > 0
Remote Indigenous	2.94	69.0	0.92	43.6
SA	1.46	58.5	0.60	31.4
NT	2.26	47.6	0.97	37.5
Australia	1.56	59.1	0.84	35.1

Source: AIHW DSRU 2007.

Comparison of remote Indigenous child oral health and state/territory Indigenous oral health

Indigenous children aged 6 years in remote communities had higher DMFT levels than their non-remote New South Wales counterparts, but lower levels than non-remote Indigenous children in the Northern Territory and South Australia (Table 1.10.5). Average DMFT levels for Indigenous children aged 12 years were highest among those in the Northern Territory (DMFT = 1.33) and lowest among those in New South Wales (DMFT = 0.87). A higher proportion of Indigenous children aged 6 years in remote communities had caries experience in their deciduous teeth than children in New South Wales and South Australia, and a higher percentage of Indigenous children aged 12 years in remote locations had caries experience in their permanent teeth compared with their New South Wales and South Australia counterparts (Table 1.10.5).

Table 1.10.5: Remote and state/territory caries experience of Indigenous children

Population	DMFT (6 years old)	Per cent DMFT > 0	DMFT (12 years old)	Per cent DMFT > 0
Remote Indigenous	2.94	69.0	0.92	43.6
NSW Indigenous	2.09	55.0	0.87	35.9
SA Indigenous	3.64	49.3	1.28	37.0
NT Indigenous	3.96	67.8	1.33	46.1

Source: AIHW DSRU 2007.

Time series analysis

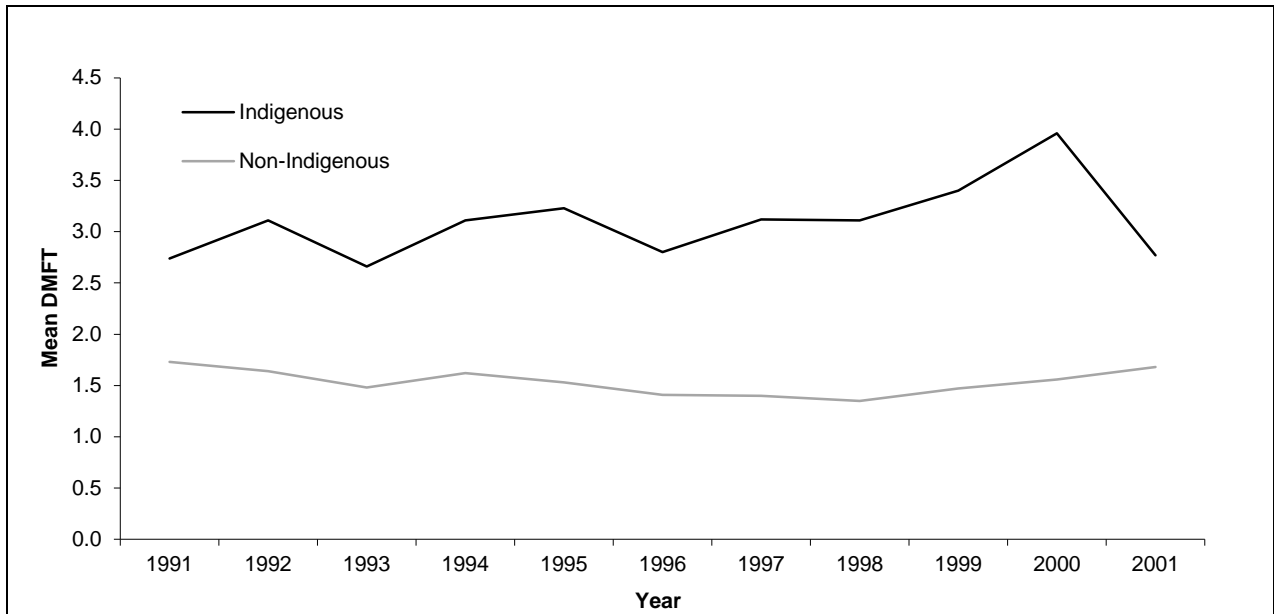
Time series data for caries experience among Indigenous children are available for the Northern Territory and are presented in Table 1.10.6 and Figures 1.10.13 and 1.10.14.

- Between 1991 and 2001, the mean number of decayed, missing and filled deciduous teeth (DMFT) for Indigenous children in the Northern Territory at 6 years of age varied from year to year.
- For the period 1991–2001, there was little change in the number of decayed, missing and filled deciduous (DMFT) and permanent teeth (DMFT) for Indigenous and non-Indigenous children.
- The mean DMFT and DMFT scores were higher for Indigenous children than for non-Indigenous children over the period 1991–2001.
- The decline in Indigenous DMFT in 2001 may be part of normal variation in Indigenous data which may relate to particular remote communities receiving school dental services in any particular year.

Table 1.10.6: Mean DMFT and DMFT scores for Indigenous children in NT, 1991–2001

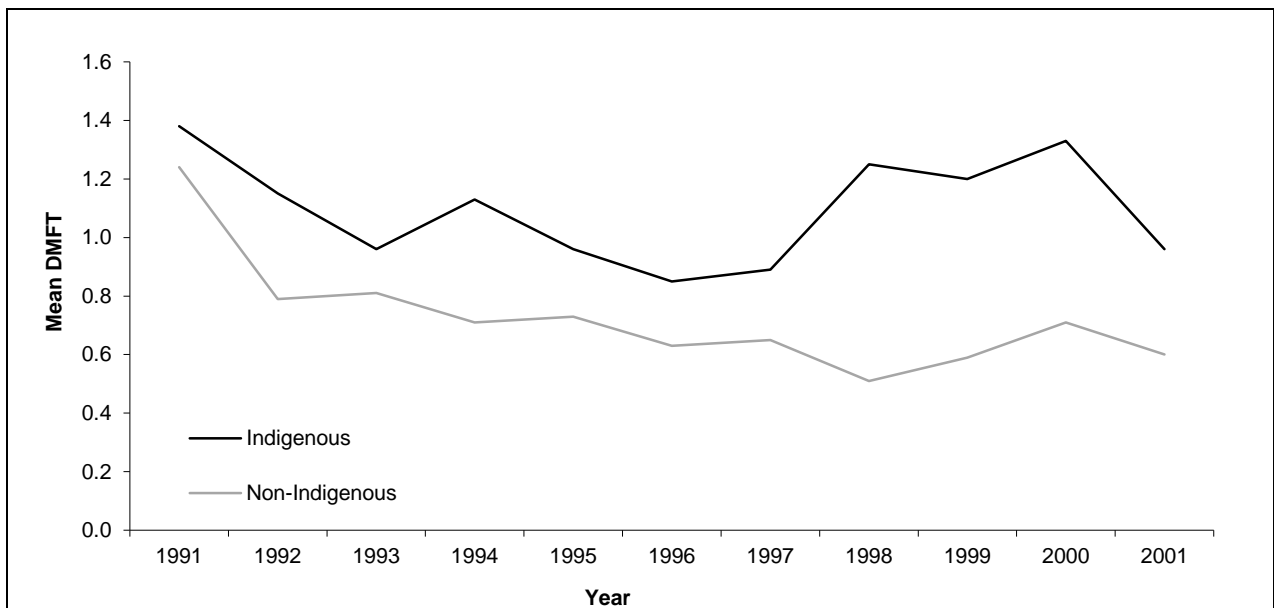
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Mean DMFT scores, children aged 6 years											
Indigenous	2.74	3.11	2.66	3.11	3.23	2.80	3.12	3.11	3.4	3.96	2.77
Non-Indigenous	1.73	1.64	1.48	1.62	1.53	1.41	1.40	1.35	1.47	1.56	1.68
Mean DMFT scores, children aged 12 years											
Indigenous	1.38	1.15	0.96	1.13	0.96	0.85	0.89	1.25	1.20	1.33	0.96
Non-Indigenous	1.24	0.79	0.81	0.71	0.73	0.63	0.65	0.51	0.59	0.71	0.60

Source: AIHW Dental Statistics Research Unit.



Source: AIHW Dental Statistics Research Unit.

Figure 1.10.13: Mean DMFT scores for children at 6 years of age in NT, by Indigenous status, 1991-2001



Source: AIHW Dental Statistics Research Unit.

Figure 1.10.14: Mean DMFT scores for children at 12 years of age in NT, by Indigenous status, 1991-2001

Adult oral health

The latest available data on DMFT scores and complete loss of all natural teeth for Indigenous adults come from the 2004-06 Adult Dental Health Survey.

- In 2004–06, the mean number of decayed, missing or filled teeth for Indigenous adults aged 15 years and over was 14.8 compared with 12.8 for non-Indigenous persons of the same age. The mean numbers of decayed and missing teeth were higher for Indigenous adults across all age groups from 15 to 74 years, and the mean number of filled teeth was higher for non-Indigenous adults in the age groups 35–54 and 55–74 years (Table 1.10.7, Figure 1.10.15).
- Overall, a higher percentage of Indigenous persons aged 15 years and over had no natural teeth (7.9%) than non-Indigenous persons aged 15 years and over (6.4%) (Figure 1.10.16). This difference is observed in all age groups over 35 years of age and is particularly marked in the 35–54 age group where Indigenous adults were around five times as likely to have no natural teeth as non-Indigenous adults.

Table 1.10.7: Mean number of decayed, missing or filled teeth for adults, by age group and Indigenous status, 2004–06

	Age group				
	15–34	35–54	55–74	> 75+	All ages (15+)
Mean no. of decayed teeth					
Indigenous	1.7 ^(c)	4.1 ^(c)	1.4 ^(c)	n.p.	2.7 ^(c)
Non-Indigenous	0.9	0.8	0.5	0.6 ^(b)	0.8
Mean no. of missing teeth					
Indigenous	4.0 ^(b)	7.4 ^(b)	13.1 ^(b)	n.p.	7.4
Non-Indigenous	3.5	5.3	10.2	14.2	6.1
Mean no. of filled teeth^(a)					
Indigenous	1.3	4.3	8.8	n.p.	4.7
Non-Indigenous	0.1	8.2	11.5	9.6	5.9
Mean no. of filled tooth surfaces					
Indigenous	8.0 ^(c)	15.9 ^(b)	26.5 ^(b)	n.p.	16.6 ^(b)
Non-Indigenous	5.6	24.5	34.7	30.3	19.9
Mean no. of decayed, missing or filled teeth					
Indigenous	7.0 ^(c)	15.8	23.3	n.p.	14.8
Non-Indigenous	4.5	14.3	22.2	24.4	12.8

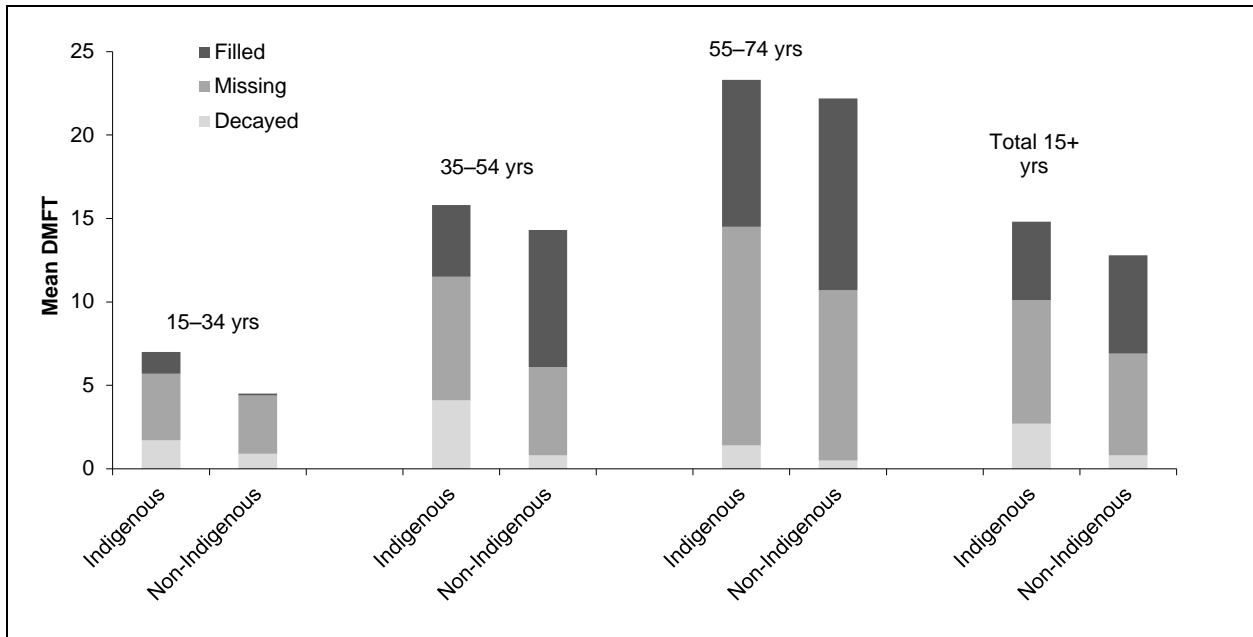
(a) No relative standard error estimates for mean number of filled teeth available.

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

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

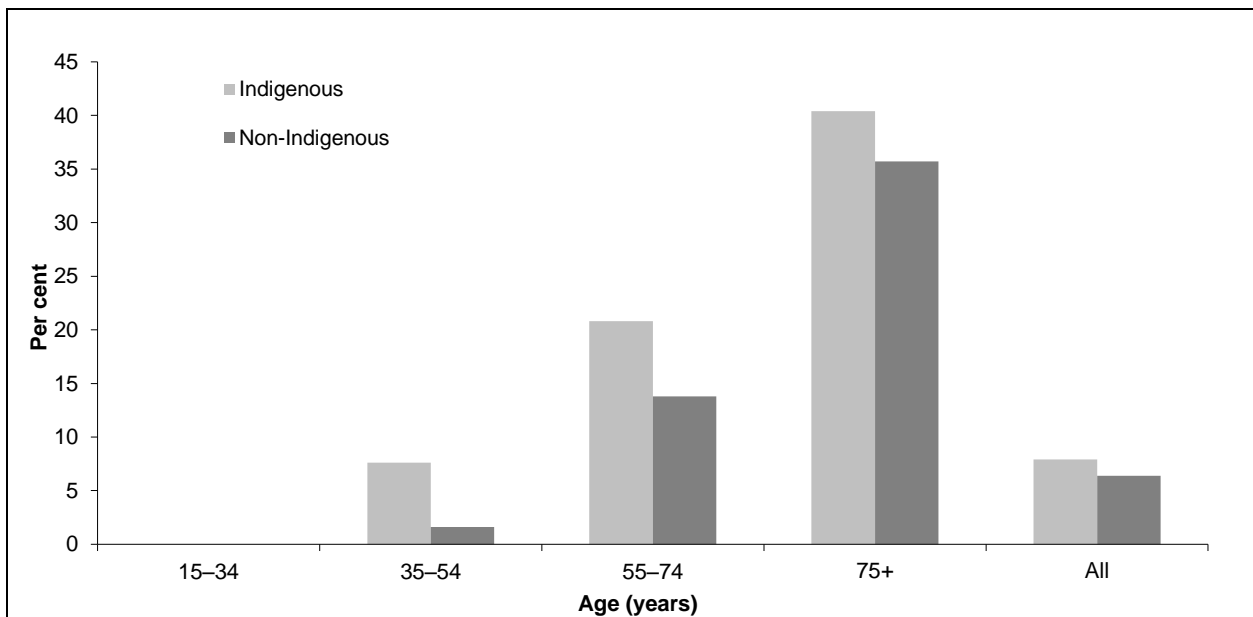
Note: Excludes those with no natural teeth.

Source: Roberts-Thomson & Do 2007.



Source: Roberts-Thomson & Do 2007.

Figure 1.10.15: Mean number of decayed, missing or filled teeth for persons aged 15 years and over, by age group and Indigenous status, 2004-06



Source: Roberts-Thomson & Do 2007.

Figure 1.10.16: Persons aged 15 years and over with no natural teeth (complete tooth loss), by Indigenous status, 2004-06

Hospitalisations for dental problems

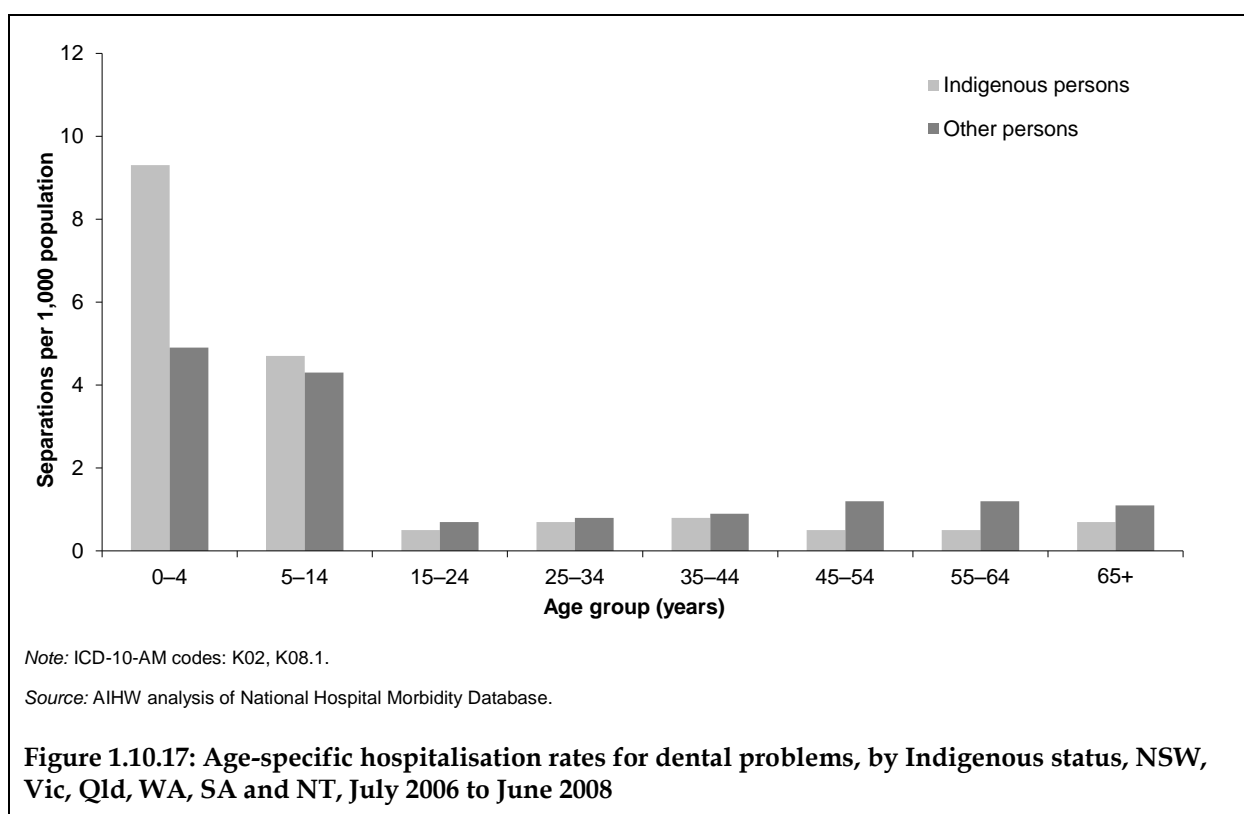
- For the 2-year period July 2006 to June 2008, in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined, there were 67,133 hospitalisations for dental problems, of which 2,710 (4%) were Aboriginal and Torres Strait Islander people.
- Indigenous children aged 0–4 years had higher hospitalisation rates for dental problems (dental caries and tooth extractions) than other children of the same age. Between the ages of 5–14 years and 35–44 years, the hospitalisation rate for dental problems among Indigenous Australians was similar to that of other Australians. Other Australians aged 45 years and over had a higher hospitalisation rate than Indigenous Australians (Figure 1.10.17).
- After adjusting for differences in age structure between the two population groups, Indigenous and other Australians in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined were hospitalised at similar rates for dental problems (1.8 per 1,000 and 1.7 per 1,000, respectively)

Table 1.10.8: Age-specific hospitalisation rates (separations per 1,000 population) for dental problems, by Indigenous status, NSW, Vic, Qld, WA, SA and NT^(a), July 2006 to June 2008

	0–4	5–14	15–24	25–34	35–44	45–54	55–64	65+
Indigenous persons	9.3	4.7	0.5	0.7	0.8	0.5	0.5	0.7
Other persons	4.9	4.3	0.7	0.8	0.9	1.2	1.2	1.1

(a) Private hospitals in the Northern Territory are excluded.

Source: AIHW analysis of National Hospital Morbidity Database.



Additional information

Child oral health

Dental health problems of Aboriginal children

Information on dental problems among Aboriginal children was collected in the Western Australian Aboriginal Child Health Survey between 2001 and 2002. Carers of Aboriginal children were asked whether their child currently had a number of dental problems including cavities and dental fillings.

- Overall, carers assessed approximately 38% of Aboriginal children aged 0–17 years as having one or more dental problems (tooth decay, tooth removals or fillings). Almost half of children aged 4–17 years had experienced one or more dental problems at the time of the survey (47%). The proportion of children who had dental problems varied by level of relative isolation, with children living in Perth metropolitan areas twice as likely to have tooth decay, a tooth removal or filling (52%) than children living in areas of extreme isolation (25%).
- Carers assessed approximately 19% of Aboriginal children aged 0–17 years as having holes in their teeth. Prevalence of cavities was lowest for children aged 0–3 years (8%) and highest for children aged 4–7 years (31%).
- Around 9% of Aboriginal children were reported to have ever had a tooth removed. Children aged over 3 years were more likely to have had a tooth extraction for dental decay.
- Over one-quarter (28%) of children aged 0–17 years were reported to have had dental fillings. A greater proportion of older children were reported to have ever had a tooth filled than younger children. Less than 1% of children aged 0–3 years had ever had a dental filling compared with around 40% of children aged 8–11 years and 12–17 years.
- An estimated 6% of Aboriginal children aged 0–17 years were reported to have a problem with sore and bleeding gums. The prevalence of sore and bleeding gums was highest for children aged 12–17 years (8%).

Dental characteristics of Indigenous children in remote communities

Data on the oral health of Indigenous children in remote communities come from a study undertaken in 2000–2003 by the Australian Research Centre for Population Oral Health in collaboration with the Far West Area Health Service (New South Wales), the remote Indigenous communities of Nganampa lands (South Australia), and various remote communities around Alice Springs (Northern Territory).

Dental characteristics of remote Indigenous children are presented in Table 1.10.9. Almost one-third were classified as 'high caries risk' and just over one-fifth were in the 'moderate' gingivitis risk group. One-quarter had 'moderate' hypoplasia on permanent teeth and one-quarter had 'mild' fluorosis on permanent teeth.

Table 1.10.9: Dental characteristics of remote Indigenous children, 2000–2003

	Number	Per cent
Caries risk status		
Low	366	44.0
Moderate	193	23.2
High	265	31.9
Gingivitis risk status		
Low	541	65.1
Moderate	171	20.6
High	56	6.7
Hypoplasia on permanent teeth		
None	92	25.4
Mild	127	35.1
Moderate	88	24.3
Severe	55	15.2
Fluorosis on permanent teeth		
None	120	58.3
Mild	50	24.3
Moderate	33	16.0
Severe	3	1.5

Source: Jamieson et al. 2007.

Dental characteristics of remote Indigenous children by age group are presented in 1.10.10. Less than 4% of children aged less than 5 years brushed their teeth at home, compared with almost one-quarter of those aged 10–14 years (23%). Children aged less than 5 years and 5–9 years were at the highest caries risk (37% and 39% respectively), and those aged 15–16 years were at the highest gingivitis risk (25%). The prevalence of hypoplasia and fluorosis on permanent teeth was higher among children in the older age groups.

Table 1.10.10: Dental characteristics of remote Indigenous children, by age group, 2000–2003

	< 5 years		5–9 years		10–14 years		15–16 years	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Brush teeth school	11	21.2	78	20.5	52	14.6	5	20.8
Brush teeth home	2	3.8	79	20.7	80	22.5	3	12.5
Caries risk status								
Low	28	53.8	130	34.1	192	54.1	10	41.7
Moderate	5	9.6	98	25.7	76	21.4	8	33.3
High	19	36.5	150	39.4	84	23.7	6	25.0
Gingivitis risk status								
Low	38	73.1	290	76.1	198	55.8	8	33.3
Moderate	3	5.8	56	14.7	97	27.3	10	41.7
High	—	—	10	2.6	39	11.0	6	25.0
Hypoplasia on permanent teeth								
None	3	100.0	49	26.1	31	20.0	3	42.9
Mild	—	—	72	38.3	54	34.8	1	14.3
Moderate	—	—	45	23.9	42	27.1	1	14.3
Severe	—	—	22	11.7	28	18.1	2	28.6
Fluorosis on permanent teeth								
None	3	100.0	55	61.8	55	54.5	—	—
Mild	—	—	21	23.6	26	25.7	2	40.0
Moderate	—	—	11	12.4	19	18.8	3	60.0
Severe	—	—	2	2.2	1	1.0	—	—

Source: Jamieson et al. 2007.

Water fluoridation and children's oral health

Water fluoridation is the process of adjusting the level of fluoride in drinking water to achieve a concentration of approximately 1 part per million (ppm). That concentration is effective in preventing decay but it does not cause appreciable levels of dental fluorosis, a discolouration of the enamel that, in severe cases, creates a chalky appearance on the tooth surface. Fluoride reduces dental decay by making teeth less susceptible to the acids formed by micro-organisms living on and around the teeth. Fluoride can also assist in reversing the process of decay once it has begun. Some small communities in Australia have drinking water that contains naturally occurring fluoride in a concentration of around 1 ppm; that concentration is achieved by water fluoridation in most larger communities and cities (Jamieson et al. 2007).

Non-fluoridated water supplies are more likely in rural and remote areas, where a significant proportion of the population is Indigenous, and there is evidence that children in these areas are more likely to have poorer dental health (Armfield 2006). Data from the Child Dental Health Survey showed that children from fluoridated areas had less dental decay than children from non-fluoridated areas (Jamieson et al. 2007). Within each jurisdiction, children from areas with fluoride concentrations at or above 0.7 ppm had fewer DMFT per child, on average, than did children residing in areas with relatively low fluoride concentrations. The proportion of Australians who had access to fluoridated water in 2006 ranged from 5% in Queensland to 100% in the Australian Capital Territory (Australian Dental Association 2006).

Adult oral health

The National Survey of Adult Oral Health collected information on the oral health status, dental care and oral health perceptions of Indigenous and non-Indigenous Australians. This information is presented below.

Oral health status

In 2004–06, approximately 12% of Indigenous persons aged 15 years and over wore dentures, 57% reported untreated coronal decay (compared with 25% of non-Indigenous persons), 8% had untreated root decay and only 4% had no dental decay (compared with 10% of non-Indigenous persons). In addition, 21% of Indigenous persons reported having periodontitis, 21% reported periodontal pockets of depth of 4 mm and 27% reported gingival inflammation (Table 1.10.11).

Table 1.10.11: Oral health status of persons aged 15 years and over, Australia, 2004–06

	Indigenous	Non-Indigenous
	Per cent	
Fewer than 21 teeth ^(a)	10.4 ^(c)	11.4
Wear dentures ^(a)	11.5 ^(c)	15.0
Untreated coronal decay ^(a)	57.0 ^(c)	25.1
Untreated root decay ^(a)	7.7 ^(d)	6.7
One or more filled teeth ^(a)	82.5	83.9
No dental decay ^(a)	3.8 ^(d)	10.0
Moderate or severe periodontitis ^(b)	29.0 ^(c)	22.9
Periodontitis ^(b)	21.2 ^(c)	19.0
4mm periodontal pocket depth ^(b)	21.4 ^(c)	19.7
2+mm gingival recession ^(b)	56.1 ^(c)	52.8
Gingival inflammation ^(b)	26.8 ^(c)	19.6

(a) Excludes those with no natural teeth.

(b) Includes those who were periodontally examined only.

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

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

Source: Roberts-Thomson & Do 2007.

Dental care

Information on the dental care of Indigenous and non-Indigenous Australians is presented in Table 1.10.12.

- In 2004–06, approximately 51% of Indigenous persons aged 15 years and over reported they had visited a dentist in the last 12 months and 15% reported their last dental visit was at least 5 years ago compared with 60% and 12% of non-Indigenous Australians respectively.
- Indigenous persons were less likely to have attended a private dental practice at the last dental visit (66%), to have paid for their last dental visit (80%), to usually visit a dentist at least once a year (43%), to have a regular dentist (72%) and to usually visit a dentist for a check-up (45%) than non-Indigenous persons (83%, 92%, 53%, 79% and 56% respectively).
- Indigenous Australians were more likely to report that they had avoided or delayed dental care (38%), that cost had prevented recommended dental treatment (34%) and that they would have a lot of difficulty paying a \$100 dental bill (27%) than non-Indigenous Australians.

Table 1.10.12: Dental care of Indigenous and non-Indigenous adults, 2004–06

	Indigenous	Non-Indigenous
	Per cent	
Visit dentist in last 12 months	50.7	59.5
Last dental visit at least 5 years ago	14.5 ^(a)	11.8
Attended private dental practice at last dental visit	66.2	83.4
Paid for last dental visit ^(b)	79.8	91.5
Usually visit dentist at least once a year ^(c)	43.4	53.3
Have a regular dentist ^(d)	72.1	78.7
Usually visit dentist for check-up	44.6	56.4
Avoided or delayed dental care	37.7	29.9
Reported cost had prevented recommended dental treatment ^(e)	33.7 ^(a)	20.5
Would have a lot of difficulty paying \$100 dental bill	26.9 ^(a)	18.1

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

(b) People who visited dentist within last 5 years.

(c) Excludes those with no natural teeth.

(d) People who visited dentist in last 5 years. Excludes those with no natural teeth.

(e) People who visited dentist within last 2 years.

Source: Spencer & Harford 2007.

Oral health perceptions

Information on the dental care of Indigenous and non-Indigenous Australians is presented in Table 1.10.13.

- In 2004–06, Indigenous persons were more likely than non-Indigenous Australians to report their oral health as fair or poor (25% compared with 16%), to experience toothache (27% compared with 15%), to need dentures (16% compared with 7%), to need an extraction or filling (49% compared with 33%) and to need oral treatment within 3 months (83% compared with 69%).

Table 1.10.13: Oral health perceptions of Indigenous and non-Indigenous adults, 2004–06

	Indigenous	Non-Indigenous
	Per cent	
Avoid foods due to dental problems	34.9	17.1
Self-assessed fair/poor oral health ^(a)	25.1 ^(c)	16.3
Experiences toothache ^(a)	27.0 ^(c)	15.0
Experiences orofacial pain	27.1 ^(c)	22.5
Needs dentures	15.8 ^(c)	7.1
Need an extraction or filling ^(a)	48.8	32.6
Perceive a need for a check-up ^(a)	58.1	59.6
Perceive need for treatment within 3 months ^{(a)(b)}	82.9	69.1

(a) Excludes those with no natural teeth.

(b) People who need an extraction or filling.

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

Source: Harford & Spencer 2007.

Dental consultations and oral health actions

Information on the dentist consultations and oral health actions of Indigenous Australians was also collected in the 2004–05 NATSIHS and yielded similar findings to the Adult Dental Health Survey. This information is summarised below.

- In 2004–05, approximately 4% of Indigenous Australians and 6% of non-Indigenous Australians aged 2 years and over reported they had visited a dentist in the last two weeks.
- Approximately 89% of Indigenous Australians aged 15 years and over reported they had visited a health professional about their teeth at some point in their lives. A higher proportion of Indigenous people living in remote areas had visited a health professional about their teeth than Indigenous people living in non-remote areas (94% compared with 76%).
- In 2004–05, approximately 10% of Indigenous Australians aged 15 years and over reported wearing dentures and 6% reported they required dentures. A higher proportion of Indigenous Australians in non-remote areas reported wearing dentures than those living in remote areas (12% compared with 5%), whereas a higher proportion of Indigenous people in remote areas reported they required dentures (8%) than those living in non-remote areas (6%).

For more detailed information on oral health actions of Indigenous Australians from the NATSIHS, see the 2006 edition of this report (detailed analyses).

NATSISS data

Information from the 2008 NATSISS is available on children aged 0–14 years, regarding teeth or gum problems and the reason for parents not taking children to see the dentist when they needed to. Data on teeth and gum problems is available for breakdown by type of dental or gum problem, age, state/territory, remoteness, number of months with the problem, and the time since last dental check. This data is presented in tables 1.10.14, 1.10.15, 1.10.16, 1.10.17, 1.10.18, 1.10.19, and 1.10.20.

In 2008, over 57,000 (32% of the sample) Indigenous children aged 0–14 years had reported teeth or gum problems. 15.5% of Indigenous children aged 0–14 years reported tooth or gum problems due to tooth or teeth being filled because of dental decay, and 15.2% reported problems due to cavities or dental decay (Table 1.10.14).

Table 1.10.14: Number and proportion of Indigenous children aged 0–14 years^(a) with reported teeth or gum problems, by type of dental or gum problem, 2008

	Number	Proportion
Type of teeth/gum problem		
Cavities or dental decay	27,089	15.2
Tooth or teeth filled because of dental decay	27,647	15.5
Teeth pulled out because of dental decay	12,203	6.8
An accident caused breakage or loss of teeth	7,474	4.2
Bleeding or sore gums	4,927	2.8
Other problems with teeth or gums	6,713	3.8
Total has teeth or gum problems^(b)	57,056	32.0
Does not have teeth or gum problems	121,177	68.0
Total^(c)	178,233	100.0
<i>Not known</i>	3,581	..

(a) Indigenous children who have teeth. Excludes children who do not have teeth.

(b) Total will be less than the sum of the components as a child can have more than one tooth or gum problem.

(c) Excludes not known responses.

Source: AIHW analysis of 2008 NATSISS.

For Indigenous children aged 0–14 years with reported teeth or gum problems, the most problems occurred between 10–14 years of age. The number of problems experienced was 26,380 (46% of the total problems experienced) (Table 1.10.15).

Table 1.10.15: Number and proportion of Indigenous children^(a) with reported teeth or gum problems, by age, 2008

Age (years)	Number	Proportion
0–4	5,553	9.7
5–9	25,123	44.0
10–14	26,380	46.2
Total	57,056	100.0

(a) Indigenous children who have teeth. Excludes children who do not have teeth.

Note: Excludes not known responses.

Source: AIHW analysis of 2008 NATSISS.

Within Victoria, 38% of Indigenous children aged 0–14 years reported teeth or gum problems, compared to the Northern Territory where only 20% of Indigenous children reported teeth and gum problems (Table 1.10.16).

Table 1.10.16: Number and percentage of Indigenous children aged 0–14 years^(a) with reported teeth or gum problems, by state/territory, 2008

	Number	Per cent ^(b)
NSW	17,826	32.8
Vic	4,519	38.3
Qld	17,811	33.8
WA	6,653	28.1
SA	3,190	33.1
Tas/ACT	2,885	36.8
NT	4,171	20.3
Australia	57,055	31.6

(a) Excludes Indigenous children who do not have teeth and not known responses.

(b) Based on 2008 Indigenous population.

Source: AIHW analysis of 2008 NATSISS.

Within non-remote areas, 34% of Indigenous children aged 0–14 years reported teeth or gum problems compared to 24% of Indigenous children living in remote areas (Table 1.01.17).

Table 1.10.17: Number and percentage of Indigenous children aged 0–14 years^(a) with reported teeth or gum problems, by remoteness, 2008

	Number	Per cent
Non-remote	47,307	34.1
Remote	9,748	24.0
Total	57,055	31.8

(c) Excludes Indigenous children who do not have teeth and not known responses

(d) Based on 2006 Indigenous population

Source: AIHW analysis of 2008 NATSISS.

For Indigenous children aged 0–14 years with reported teeth or gum problems, over half (58%) had the problem for over 12 months. This was greater in non-remote (60%) than remote (49%) areas (Table 1.10.18).

Table 1.10.18: Number and proportion of Indigenous children aged 0–14 years with reported teeth or gum problems by number of months with teeth or gum problem and remoteness, 2008

Number of months	Non-remote		Remote		Total	
	Number	Proportion	Number	Proportion	Number	Proportion
1 month	7,927	16.8	1,779	18.2	9,706	17.0
2 to <6	5,690	12.0	1,737	17.8	7,426	13.0
6 to <12	5,208	11.0	1,417	14.5	6,625	11.6
12+	28,483	60.2	4,816	49.4	33,299	58.4
Total	47,307	100.0	9,748	100.0	57,056	100.0

Source: AIHW analysis of 2008 NATSISS.

For Indigenous children aged 0–14 years with reported teeth or gum problems, the majority (28%) had a dental check less than 3 months ago. Twenty-two per cent last had a dental check 6 months to less than a year ago, and 22% last had a check 1 year ago to less than 2 years ago (Table 1.10.19).

Table 1.10.19: Number and proportion of Indigenous children aged 0–14 years^(a) with reported teeth or gum problems by time since last dental check, 2008

Time since last dental check	Number	Proportion
Less than 3 months ago	15,656	27.9
3 months to less than 6 months ago	8,622	15.3
6 months to less than a year ago	12,344	22.0
1 year ago to less than 2 years ago	12,096	21.5
2 years ago or more	3,237	5.8
Never	4,227	7.5
Total^(b)	56,180	100.0
Not known	875	..

(a) Includes children who have teeth only.

(b) Excludes not known responses.

Source: AIHW analysis of 2008 NATSISS.

In 2008, 14,751 Indigenous children aged 0–14 years needed to go to the dentist, but were not taken by a parent. The main reason parents identified for this was that the waiting time was too long, or the dentist was not available at the time required (32%) (Table 1.10.20).

Table 1.10.20: Reasons parent did not take child to see a dentist when needed to in last 12 months, 2008

Reasons why parent did not take child to see a dentist when needed to	Number	Proportion
Cost	3,048	20.7
Transport/distance	1,712	11.6
Waiting time too long or not available at time required	4,715	32.0
Not available in area	2,311	15.7
Could not find time to take child (including personal/ family responsibilities)	2,382	16.1
Dislikes service/professional/afraid/embarrassed	1,330	9.0
Decided not to seek care for child	860	5.8
Other	1,769	12.0
Total needed to go to a dentist but didn't^(a)	14,751	100.0
Total did not need to see dentist in last 12 months	163,804	..

(a) Total will be less than the sum of the components as more than one reason may be reported.

Note: Children aged 0–14 years who had teeth and needed to go to a dentist but did not go.

Source: AIHW analysis of 2008 NATSISS.

International comparisons

Information is available on the oral health of Maori children in New Zealand, First Nation children in Canada and Native American children in the United States of America.

Indigenous child oral health in New Zealand

There is no national survey data that describe the oral health status of Maori children in New Zealand. However, regional studies suggest that Maori children experience higher levels of dental disease than non-Maori children (Thomson 1993, cited in Jamieson et al. 2007), and that this disparity is widening (Lee & Dennison 2004; Thomson et al. 2002, cited in Jamieson et al. 2007). In a survey of 3,283 5-year-olds in one region, the proportion of Maori children identified as having dental caries severe enough to warrant treatment under a general anaesthetic was over twice that of non-Maori children (Thomson 1993, cited in Jamieson et al. 2007). Another report found that 66% of children receiving dental care under a general anaesthetic in one region were Maori, and that demand for this form of care was increasing (Broughton 2000; Thomson 1994, cited in Jamieson et al. 2007).

Indigenous child oral health in Canada

Although dental health is improving among Canadian children in the general population, the same cannot be said for First Nation Canadian children. A comparison of two national oral health surveys of First Nation Canadian children conducted in 1990–91 and 1996–97 respectively showed that deft (decayed, extracted, filled deciduous teeth) scores for 6-year-old children had increased from 8.2 to 8.7, and mean DMFT scores had increased from 0.7 to 0.8. This was in contrast to the overall Canadian child population in these age groups, where a decrease in dental disease experience was noted (Peressini et al. 2004, cited in Jamieson et al. 2007). Other regional reports of First Nation Canadian child oral health show similar trends (Harrison & Davis 1993; Harrison & White 1997; Klooz 1988, cited in Jamieson et al. 2007).

Indigenous child oral health in the United States of America

Findings from the 1991 Indian Health Service Patient Oral Health Status and Treatment Needs Survey revealed that Native American children experienced a much higher prevalence of dental caries in their primary and permanent teeth than the general US child population (Niendorff & Jones 2000, cited in Jamieson et al. 2007). Grim et al. (1994) reported that of 1,667 public school students dentally examined in Oklahoma, Native American children had over double the DMFT and DMFS scores of their non-Native American counterparts. The mean DMFT for children aged 5–6 years was 10.4 for Native American children and 5.1 for non-Native American children, and the mean DMFS for children aged 15–17 years was 10.1 for Native American children and 6.0 for non-Native American children (Jamieson et al. 2007). A review of several large-scale oral health epidemiologic surveys found that Native American children had greater caries experience than non-Native American children, with risk factors including rural residence, minimal exposure to fluoride, and coming from less educated or poorer families (Caplan & Weintraub 1993, cited in Jamieson et al. 2007).

Northern Territory Emergency Response Child Health Check Initiative

In total, 3,738 dental records had been received by the AIHW that related to services conducted on or before 30 June 2009 for the NTER CHCI (Northern Territory Emergency Response Child Health Check Initiative). After removing duplicate records and records for children outside the applicable age range, 3,608 processed records remained. These represented 3,608 occasions of service provided to 2,349 children. Of these 2,349 children, 1,456 had one check, 621 children had two checks, 199 children had three checks and 73 children had four or more checks (Table 1.10.21).

Table 1.10.21: Number of dental checks^(a) per child, Indigenous children who had a dental check as part of the NTER CHCI

	Checks		Children	
	Number	Per cent of all checks	Number	Per cent of children with consent ^(b)
Dental checks with consent				
1 dental check ^(b)	1,456	28.5	1,456	62.0
2 dental checks	1,242	24.3	621	26.4
3 dental checks	597	11.7	199	8.5
4 dental checks	228	4.5	57	2.4
5 dental checks	60	1.2	12	0.5
6 dental checks	18	0.4	<5	0.1
7 dental checks	7	0.1	<5	< 0.1
<i>Total checks with consent</i>	<i>3,608</i>	<i>70.7</i>	<i>2,349</i>	<i>100.0</i>
Dental checks without consent	1,498	29.3	1,006	..
Total number of dental checks	5,106	100.0	3,355	..

(a) This excludes duplicate forms and forms for children outside of the applicable age range that were found during the processing stage.

(b) Consent to transfer children's information to AIHW.

Source: AIHW analysis of NTER CHCI Dental data for services on or before 30 June 2009.

Nearly one in four (24%) children who had dental checks were aged 0 to 5 years, while 56% were aged 6 to 11 years and almost 20% were aged 12 to 15 years (Table 1.10.22). An equal proportion of boys and girls had had a dental check (both 50%).

Table 1.10.22: Demographic characteristics, Indigenous children who had a dental check as part of the NTER CHCI

	Children	
	Number	Per cent
Age group		
0–5 years	565	24.1
6–11 years	1,315	56.0
12–15 years	462	19.7
Missing	7	0.3
Sex		
Male	1,170	49.8
Female	1,178	50.2
Missing	<5	<0.1
Total	2,349	100.0

Note: These figures are based on each child's latest check.

Source: AIHW analysis of NTER CHCI Dental data for services on or before 30 June 2009.

As part of the dental check, health professionals were asked to record which dental services were provided. More than nine out of 10 (93%) children who received an NTER CHCI dental check received a diagnostic service. In addition, nearly three in five (59%) children who received a dental check received a preventative service, half (50%) received a restorative service and 16% received a surgical service. Less than 2% of children received a periodontal service, endodontic service, orthodontic service, or work on a crown or bridge. No children received a prosthetics service. Approximately 7% of children received some other type of treatment (Table 1.10.23).

Table 1.10.23: Dental services provided by dental clinicians, by number of Indigenous children who received a dental check as part of the NTER CHCI

Dental services provided	Number	Per cent
Diagnostic	2,185	93.0
Preventative	1,385	58.9
Restorative	1,183	50.3
Surgery	366	15.5
Endodontic	43	1.8
Periodontal	36	1.5
Crown or bridge	19	0.8
Orthodontic	6	0.2
Prosthetics	0	0.0
Other	174	7.4
Total number of children	2,349	100.0

Note: This is a multiple response item. If a child was provided with a dental service at any one of their dental checks, they were counted once against that particular service. Data about dental services were missing for 1.7% of children.

Source: AIHW analysis of NTER CHCI Dental data for services on or before 30 June 2009.

As part of the dental check, health professionals were asked to record which problems were treated. Approximately half (54%) of children who received a NTER CHCI dental check were treated for previously untreated caries. Half (50%) of the children who received a dental check were provided with oral health education and 24% (about a quarter) were treated for inadequate dental hygiene (including plaque and calcification). Around one in 18 (6%) children were treated for mouth infection or mouth sores and one in 36 (3%) were treated for gum disease. Less than 2% of children were treated for broken or chipped teeth due to trauma, abnormal teeth growth or missing teeth. Around 9% of children who received a dental check were treated for other problems (Table 1.10.24).

Table 1.10.24: Dental problems treated by dental clinicians, by number of Indigenous children who received a dental check as part of the NTER CHCI

Problems treated	Number	Per cent
Untreated caries	1,268	53.9
Oral health education	1,177	50.1
Dental hygiene (including plaque and calcification)	574	24.4
Mouth infection or mouth sores	134	5.7
Gum disease	67	2.8
Abnormal teeth growth	37	1.5
Broken or chipped teeth due to trauma	35	1.4
Missing teeth	13	0.5
Other	222	9.4
Total number of children	2,349	..

Note: This is a multiple response item. If a child was treated for a dental problem at any one of their dental checks, they were counted once against that particular problem. Data about problems treated were missing for 3.4% of children.

Source: AIHW analysis of NTER CHCI Dental data for services on or before 30 June 2009.

Table 1.10.25 shows the problems treated among children who had at least one dental check, with or without a previous CHC. Although 'problems treated' cannot directly evaluate oral health, it can be used as a proxy measure. There are no dramatic differences in oral health status between these two groups of children, though the proportion of children with untreated caries is nearly ten percentage points higher in those with no CHC than in those who had a CHC. Where there are differences between oral health problems treated, they are very low for both groups of children.

It should be noted that Table 1.10.25 looks at problems treated across all dental checks provided to children, instead of the first dental check provided. This is because each check, or 'occasion of service', does not accurately reflect all of the services provided during the entire 'course of care' to which it belongs (a 'course of care' is a grouping of related occasions of service).

Table 1.10.25: Problems treated by whether or not a Child Health Check was undertaken, Indigenous children who had dental check as part of the NTER CHCI

	CHC		No CHC	
	Number	Per cent	Number	Per cent
Problems treated				
Untreated caries	797	47.7	357	57.3
Gum disease	905	54.1	347	55.7
Broken or chipped teeth due to trauma	40	2.3	25	4.0
Abnormal teeth growth	25	1.4	10	1.6
Missing teeth	29	1.7	8	1.2
Mouth infection or mouth sores	5	0.2	8	1.2
Dental hygiene (including plaque and calcification)	92	5.5	41	6.5
Other	383	22.9	187	30.0
Total number of children	1,670	..	622	..

Note: This is a multiple response item. If a child was treated for a dental problem at any one of their dental checks, they were counted once against that particular problem. Data about problems treated were missing for 3.4% of children.

Source: AIHW analysis of NTER CHCI Dental data and Child Health Check data for services on or before 30 June 2009.

Data quality issues

Dental health survey data

The assessment of Decayed, Missing and Filled Teeth (DMFT) is based on the World Health Organization protocol. The accuracy of DMFT will depend on the quality of the assessment and the accuracy of recording.

Child Dental Health Survey

The Child Dental Health Survey monitors the dental health of children enrolled in school dental services that health departments or authorities in each state and territory operate. Therefore, this survey will miss those children not attending these programs. There are some variations among state and territory programs with respect to priority age groups and the nature of the services provided, such as dental examinations, preventive services and restorative treatment. Caution is required in interpreting statistics for those over the age of 12 years, as many programs only include primary school children. Different sampling procedures are used across the states and territories (Armfield et al. 2003). The sample has not been specifically designed to measure Indigenous children and therefore caution is needed in interpreting the results. Data on Indigenous status are collected from the patient's treatment card or medical history. Problems have been identified in the accurate recording of Indigenous status in this data (Armfield et al. 2003).

Counts of children from New South Wales, South Australia and the Northern Territory have been merged for the purpose of this analysis.

Indigenous Child Oral Health in Remote Communities Study

Indigenous child oral health data were collected from remote Indigenous communities in all jurisdictions in the 2000–2003 period, as part of a study that the Australian Research Centre for Population Oral Health undertook. The study collaborated with the Far West Area Health Service (New South Wales), the remote Indigenous communities of Nganampa lands (South Australia), and various remote communities around Alice Springs (Northern Territory). Dental health professionals providing services to these communities collected the data. Because of issues of confidentiality, specific location details were unable to be included in the analysis. The sample included 831 Indigenous children aged 2–16 years. The sample was equally distributed by sex.

National Survey of Adult Oral Health

The 2004–06 National Survey of Adult Oral Health included computer-assisted telephone interviews with 14,123 people aged 15–97 years, 5,505 of which were also dentally examined. The survey included 229 people who identified as Aboriginal or Torres Strait Islander (1.6%). Indigenous identity was based on responses to the question 'Are you of Aboriginal or Torres Strait Islander origin?' People who responded 'yes, Aboriginal', 'yes, Torres Strait Islander' or 'yes, Torres Strait Islander & Aboriginal' were classified as Indigenous. People who responded 'no' were classified as non-Indigenous. Twelve interviewees did not respond or said 'don't know' and they were excluded from estimates for the two subgroups. Results of Indigenous Australians should be interpreted with care because of the small sample size.

Under-identification

Also, the survey had a higher percentage of people that identified themselves as non-Indigenous compared to the general population. This is explained by the fact that a greater percentage of respondents did not state their Indigenous identity.

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* and *Regional and remote* areas, but *Very remote* areas were excluded from the sample. Time series comparisons are available through the 1995 and 2001 National Health Survey.

In 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 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 patterns 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 was 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 the jurisdictions not included.

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.

Northern Territory Emergency Response Child Health Check Initiative

Data coverage for the Child Health Check Initiative (CHCI) Dental data collection is limited to data collected from the dental services provided by the NT DHF and six Aboriginal Community Controlled Health Organisations (ACCHOs) that received funding from the Australian Government. However, the data from ACCHOs has not been complete. Furthermore, the scope of this collection is limited to children between the ages of 0 and 15 at the time of their dental check, unless they had received a previous health check at which they had been aged 15 years or less.

It should be also noted that some children who received the dental services did not give consent for sharing their oral health information with the AIHW. As such, apart from Table 1.10.21, the Northern Territory Emergency Response (NTER) CHCI data in this indicator are only derived from dental service information for which consent was obtained.

When interpreting data from this collection, it should be noted that the children who received a dental check were not a random sample. First, dental checks were only provided to children who volunteered for them. Second, although all Indigenous children in prescribed areas of the Northern Territory were eligible to receive a CHCI Dental check, children with dental referrals from the CHC data collection were targeted for follow-up by the dental outreach teams. Thus, the findings from the Dental data collection are not representative of the Northern Territory Indigenous child population or the Indigenous population of children within prescribed areas of the NTER CHCI.

More information about data quality and interpretation can be found in Appendix 2 of *Progress of the Northern Territory Emergency Response Child Health Check Initiative: Update on results from the Child Health Check and follow-up data collections* (AIHW and DoHA 2009).

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.

National Aboriginal and Torres Strait Islander Social Survey

The NATSISS is conducted in all states and territories and includes remote and non-remote areas. The 2008 sample was 13,300 persons in 6,900 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. 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; 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).

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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