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Dental health of Indigenous children in the Northern Territory

Progress of the Closing the Gap Child Oral Health Program up to December 2011

bulletin 102

Contents

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Abbreviations

ACCHO	Aboriginal Community Controlled Health Organisation
AIHW	Australian Institute of Health and Welfare
CHC	Child Health Check
CHCI	Child Health Check Initiative
CtG	Closing the Gap
dmft	decayed, missing or filled teeth (deciduous)
DMFT	decayed, missing or filled teeth (permanent)
DoHA	Australian Government Department of Health and Ageing
DSRU	Dental Statistics and Research Unit
HRN	hospital registration number
NTER	Northern Territory Emergency Response
NPA	National Partnership Agreement
NT	Northern Territory
NT DoH	Northern Territory Department of Health
OATSIH	Office for Aboriginal and Torres Strait Islander Health
OHSNT	Oral Health Services—Northern Territory
RAHC	Remote Area Health Corps
SCRGSP	Steering Committee for the Review of Government Service Provision

Highlights

This bulletin presents information on the dental health status and the dental services provided under the Closing the Gap (CtG) Child Oral Health Program to Indigenous children living in prescribed communities of the Northern Territory. While this program specifically targets Indigenous children who had dental referrals during their child health checks it also provides dental services to all Indigenous children less than 16 living in prescribed communities.

A total of 14,834 dental services were provided to 8,317 children between August 2007 and 31 December 2011. Of these children only 6,480 (78%) provided consent to share the detailed information on their oral health status and treatment with the AIHW and therefore much of the analyses in this bulletin are restricted to this group.

Highlights from the analyses include the following:

- Almost all children attending a dental service received a diagnostic service before proceeding with specific treatment. A large proportion of children also received preventative (82%) and restorative treatments (47%).
- Of the 3,223 Indigenous children who had received a dental referral during their health checks 2,458 (76%) had received a dental service, 756 (23%) had an outstanding dental referral indicating further need for services and 9 (less than 1%) children were considered loss-to-follow up. The average waiting time between referral and service was 18 months.
- The need for further services was highlighted by the fact that 2,001 children were referred for additional treatment or services for their oral health conditions identified during their dental visits.
- Of the children who received a dental service between 1 January and 30 June 2011 for whom decayed, missing or filled teeth (DMFT/dmft) was reported, 82% had a dental caries experience with an average of 4.5 caries per child.
- Compared with the national result from the 2006 Child Dental Health Survey, the proportion of children aged 5–12 experiencing dental caries among those who received dental services through the Closing the Gap Child Oral Health Program was 23 percentage points higher.
- About 56% of children who received dental services were treated for at least one oral health problem. The most commonly treated oral health problems were untreated caries (52%), mouth infections and dental abscesses (5%).
- For children who had two or more courses of dental care, the overall proportion seen with at least one oral health problem decreased by about 13 percentage points between their first and the most recent course of care. In addition, the prevalence of untreated carries and mouth infection or mouth sores were decreased by 14 and 6 percentage points respectively between the two courses of care. The minimum time interval between the first and latest course of care was 9 months and the median time interval was 21 months.
- Among children who were treated for mouth infections or mouth sores and untreated carries at their first course of dental care, 97% and 60% did not have the same problem at their most recent course of care respectively.

1 Introduction

1.1 Background

The oral health of Indigenous Australians has consistently been found to be worse than that of other Australians. Poor oral health can have a widespread impact on a person's health and wellbeing, including an increased risk of poor nutrition and chronic disease and adverse effects on self-esteem and speech and language development (AIHW DSRU 2000, Couzos & Murray 2003, SCRGSP 2003).

The poor oral health of Indigenous children was corroborated by child health checks, a component of the Child Health Check Initiative (CHCI) introduced under the Northern Territory Emergency Response (NTER)[1]. CHCI identified that 43% of children had an oral health problem (AIHW & DoHA 2009) and 35% of children were given a CHC were referred for dental services.

Since August 2007, the Australian Government has funded the Northern Territory Department of Health (NT DoH) Oral Health Service (OHSNT) and six Aboriginal Community Controlled Health Organisations (ACCHOs) to provide eligible children with dental services. Children were eligible to receive a dental service if they had received a Child Health Check (CHC) or were aged under 16 and were living in a prescribed community. From July 2009, these services were funded as part of the Closing the Gap (CtG) initiatives of the Northern Territory National Partnership Agreement signed by the Australian and Northern Territory governments.

By June 2012, a total of $11.1 million will have been provided to the Northern Territory (NT) to deliver these dental services. This funding has been used to enhance existing dental services in the prescribed areas, to provide dental treatment and to deploy outreach teams to remote areas.

The Closing the Gap Child Oral Health Program within OHSNT provides outreach dental services and treatment to eligible children in the prescribed areas of the NT, including treatment under general anaesthetic. These outreach services are provided by dental therapists, dentists and dental assistants who visit remote communities generally for 3-week blocks. Dental treatment under general anaesthetic is performed at local NT hospitals.

Models of delivery vary across the six ACCHOs who provide dental services. These models include:

- employing a permanent dental therapist and a dental assistant
- using the Remote Area Health Corp (RAHC) to recruit dental teams
- contracting OHSNT to provide clinical services.

While the focus of the program was to provide services to children who had a referral from the CHCI, dental services were also provided to other eligible children in the prescribed areas where possible and where funding allowed.

[1] The NTER has implemented a range of measures that aim to protect children and improve the safety of communities to provide a better future for Aboriginal people in the Northern Territory (FAHCSIA 2010).

1.2 Dental data

This bulletin builds on a previous report, *Dental health of Indigenous children in the Northern Territory* (AIHW 2011), and provides information on the progress of dental service delivery, follow-up services for children with a CHCI dental referral and the dental health of children who received dental services.

The data in this bulletin are sourced from the Northern Territory Emergency Response (NTER) dental collection, created to manage and analyse information recorded at these dental services. The data collected are:

- the child's basic demographic information—hospital registration number (HRN), date of birth, sex
- the community identification number
- type(s) of dental services provided
- type(s) of dental problems treated
- the number of decayed, missing and filled teeth—for both permanent (DMFT) and deciduous (dmft) teeth
- whether the child requires further follow-up services to complete their treatment plan.

The CHCI dental data collection has some limitations that should be considered when interpreting the data in this bulletin:

- The scope of the CHCI dental data collection is limited to dental services funded initially through CHCI, and subsequently through the Closing the Gap Child Oral Health Program. Children who received dental services through other funding sources (for example, services funded by the NT Government or the private sector) are not included. As such, the number of children who received follow-up dental services in the NT may be underestimated.
- Not all dental services provided through this funding program or provided to the target group were captured in this collection. For example, data collection from some ACCHO dental clinics has not been complete.
- As the Australian Institute of Health and Welfare (AIHW) does not receive detailed information on dental services if children's families do not consent to sharing the data, these data are not included in most of the analysis of this bulletin, apart from tables 2.1 and 2.3.
- Due to data capture problems, information on decayed, missing and filled teeth (DMFT/dmft) was only available for 939 children (78%) who received a dental service from 1 January–30 June 2011.

Detailed information on the limitations of the dental data collection, as well as other information on the CHCI and its dental data collection can be found in the published reports: *Progress of the Northern Territory Emergency Response Child Health Check Initiative* (AIHW & DoHA 2009) and *Dental health of Indigenous children in the Northern Territory* (AIHW 2011).

1.3 Structure of this bulletin

This bulletin consists of the following sections:

- *Highlights*: provides a summary of key findings of this bulletin.
- *Introduction*: presents the background information of the Closing the Gap Child Oral Health Program and the CHCI dental data collection.
- *Dental service delivery*: details the delivery of dental services, number and characteristics of children receiving these services, and the type of dental services provided. This section also includes information on the follow-up services provided to children with a dental referral from their CHC.
- *Preventive interventions and health promotion*: describes the preventive and oral health promotion programs for children in the Northern Territory.
- *Oral health status of children who received dental services*: examines the DMFT/dmft scores of children, and compares these with data from the Child Dental Health Survey 2006 (Ha et al. 2006). This section also examines the types of problems treated and the changes in oral health status for children who received dental services.

2 Dental service delivery

2.1 Dental services provided and the children who received them

In total, 14,834 dental services were provided to 8,317 children between August 2007 and 31 December 2011 (Table 2.1). In 2007–08, the number of dental services was relatively low (868), as the Closing the Gap Child Oral Health Program was in the initial phase of planning, recruiting and setting up infrastructure. The number of dental services peaked at 4,442 in 2008–09, as many children received a first-time dental assessment.

The number of dental services provided decreased to 3,570 in 2010–11, largely due to the nature of follow-up consultations, which tend to be longer in duration and often include treatment. Also, during this period the coverage of dental outreach teams was limited due to above-average rainfall in the prescribed areas of the NT, which reduced access to communities by road. Hence, fewer children could be accommodated during the 2010–11 period than in the earlier years of the program. In addition, the effort and resources required to engage 'hard to reach' children as the program progressed also contributed to decreased activity.

Table 2.1: Number of dental services provided and number of Indigenous children who received a dental service, by year and consent status, 2007–11

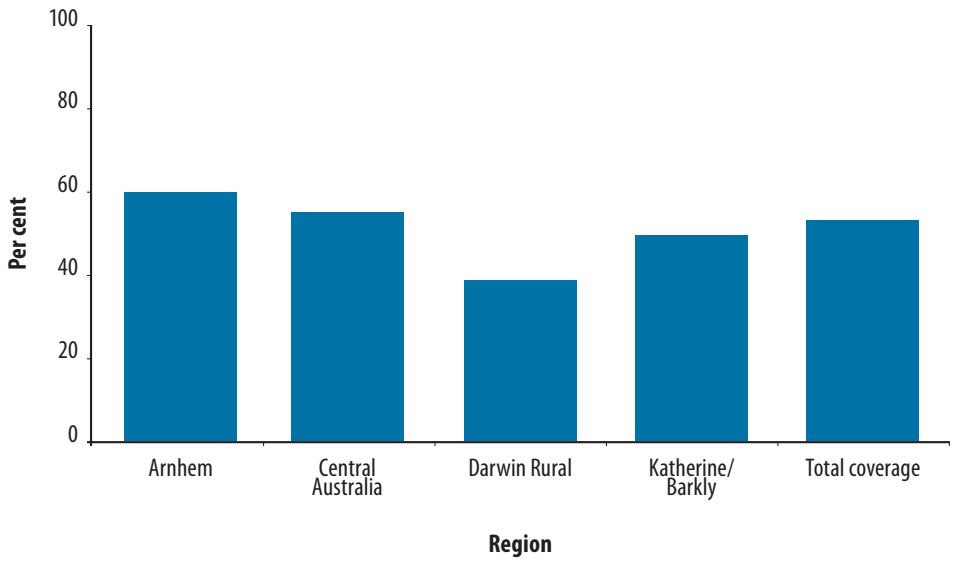
	Services			Children		
Financial year	**Consent**	**Non-consent**	**Total**	**Consent**	**Non-consent**	**Total**
August 2007 – June 2008	563	305	868	503	291	794
	(64.9%)	(35.1%)	(100%)	(63.4%)	(36.6%)	(100%)
July 2008 – June 2009	3,047	1,395	4,442	1,952	1,215	3,167
	(68.6%)	(31.4%)	(100%)	(61.6%)	(38.4%)	(100%)
July 2009 – June 2010	4,067	238	4,305	2,624	192	2,816
	(94.5%)	(5.5%)	(100%)	(93.2%)	(6.8%)	(100%)
July 2010 – June 2011	3,462	108	3,570	2,468	99	2,567
	(97.0%)	(3.0%)	(100%)	(96.1%)	(3.9%)	(100%)
July 2011 – December 2011	1,562	57	1,619	1,278	51	1,329
	(96.5%)	(3.5%)	(100%)	(96.2%)	(3.8%)	(100%)
Detail of date of services were not recorded[(a)]	0	30	30	0	30	30
	(0.0%)	(100.0%)	(100%)	(0.0%)	(100.0%)	(100%)
Total	**12,701**	**2,133**	**14,834**	**6,480**	**1,837**	**8,317**
	(85.6%)	**(14.4%)**	**(100%)**	**(77.9%)**	**(22.1%)**	**(100%)**

[(a)] These services were provided in the period from August 2007 to December 2011; however no date of service was recorded.

Note: The total number of children does not add up to the sum of the columns as children may have received services in multiple years. The total number of children represents each child only once.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

A total of 8,317 children received dental services through the Closing the Gap Child Oral Health Program between 2007 and 2011, which is approximately 51% of the Indigenous population aged under 16 in the NT prescribed areas (Figure 2.1) (A map of the NT prescribed areas is included in the Appendix 1). Figure 2.1 shows the highest proportion of children who received dental services was in Arnhem region (60%), followed by Central Australia (53%). A lower proportion of children received dental services in Katherine/ Barkly (45%) and Darwin rural (37%).



Note: Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

Figure 2.1: Proportion of the population aged under 16 who received dental services, by region, 2007–11

For the remainder of this chapter, the data analysis is undertaken using data from 6,480 children whose consent for sharing information was obtained.

Children aged 6–11 accounted for more than half (57%) the children who received dental services, as they were more easily accessible through local schools (Table 2.2). Just under one quarter of services were provided to very young children (0–5 years), while only a very small proportion of children were aged 16 and over. Although the age of children eligible to receive dental services is limited to those aged under 16, there is an exception for those children who were under 16 at the time of their CHC and received a referral for a dental service. A similar proportion of males and females received dental services.

Table 2.2: Number of Indigenous children who received dental services, by age and sex, 2007–11

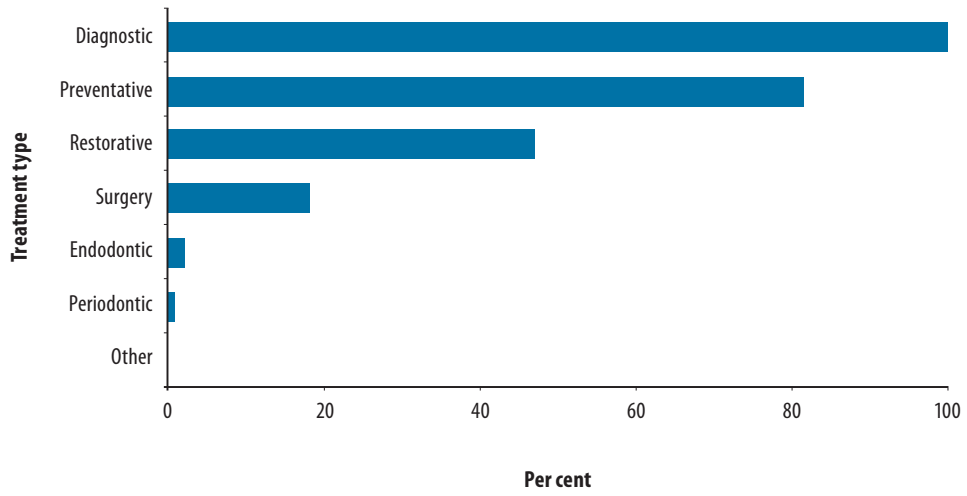
	Number	Per cent
Age group (years)		
0–5	1,379	21.3
6–11	3,692	57.0
12–15	1,261	19.5
16+	131	2.0
Not recorded	17	0.3
Total	**6,480**	**100**
Sex		
Male	3,178	49.1
Female	3,300	50.9
Not recorded	2	0.0
Total	**6,480**	**100**

Note: Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

2.2 Dental treatment received by children

Of the children who attended a dental service, 96% received a diagnostic service. All children typically receive a diagnostic service prior to any dental treatment, however only those children whose families provided consent to share this information are included in the analysis. About 82% of children also received a preventive service, restorative services (47%) and dental surgery (16%). Only a very small proportion of children received endodontic (2%), periodontic (1%) or other services (<1%) (Figure 2.2).



Notes:

1. Data include cases where Health Record Number (HRN) is unknown.
2. This is a multiple response item. Children may have received more than one treatment.
3. Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

Figure 2.2: Type of dental treatment received by Indigenous children (per cent), 2007–11

2.3 Dental referrals and follow-up services

A total of 3,223 Indigenous children received a dental referral from their health checks. Of these, 9 children were removed from the CHC dental referral list because they passed away or moved outside the prescribed communities (Table 2.3).

As at 31 December 2011, 2,458 (76%) of children who had a dental referral from their CHC had received a dental service and the remaining 756 (24%) had an outstanding dental referral (Table 2.3). Central Australia region had the lowest number of children with an outstanding dental referral (97) and Darwin Rural had the highest (258).

Table 2.3: Number of Indigenous children with a dental referral, who received dental service, average waiting time and have outstanding dental referral, by region, 2007–11

Region[c]	Children on referral list	Children who received dental service[a]		Average waiting time between referral and service (months)[b]	Outstanding dental referral		Loss to follow-up
		Number	Per cent		Number	Per cent	
Arnhem	918	684	74.5	20.4	233	25.4	n.p.
Central Australia	691	587	84.9	14.3	97	14.0	n.p.
Darwin Rural	902	643	71.3	19.8	258	28.6	n.p.
Katherine/Barkly	712	544	76.4	17.3	168	23.6	n.p.
Total	**3,223**	**2,458**	**76.3**	**18.1**	**756**	**23.5**	**9**

n.p. not publishable due to small cell sizes.

(a) Only includes children with a valid HRN.

(b) Average waiting time excludes outstanding dental referrals.

(c) Region where received dental service.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

There are a number of challenges to the provision of dental care to children who received a dental referral at their health check.

One significant challenge for providing follow-up care in the prescribed areas of the NT is the high mobility of the Indigenous population. Previous analysis found that about 40% of children with a dental referral were residing in different communities by the time they received follow-up services. The high mobility of the population makes it difficult to trace children with a referral (AIHW 2011).

A further challenge to reaching children is that most dental outreach teams access children through local schools, making it very difficult to find children who are over the age of 12 or those who do not attend school regularly (AIHW 2011).

These challenges also affect the data collected on children with referrals for follow-up dental services, especially in communities that have existing dental services and are not visited by outreach teams. As the CHCI dental data are only collected from dental services funded by the Australian Government, the dental services provided by local service providers are not included if they did not receive funding. Therefore, it is possible that children have received follow-up care for the dental referral, but are not identified through the CHCI dental collection because they received the dental services funded by other sources (AIHW 2011).

It is important to note that attending for dental services is voluntary and some children, or their parent or guardian, may have declined the offer of a service.

2.4 Further need for services

A need for further dental services remains within the prescribed areas of the Northern Territory. A total of 2,757 children were found to require further dental services at 31 December 2011 (Table 2.4). These include:

- a total of 756 children who received a dental referral from their CHC who had not been seen by an oral health practitioner
- a further 2,001 children who had been seen by a dental service and were required for further dental service for oral health conditions identified during dental services.

The largest proportion of children who require follow-up dental services reside in Arnhem region (33%), followed by Darwin Rural (30%), Central Australia (17%), and Katherine/Barkly (17%).

Table 2.4: Number of Indigenous children requiring follow-up dental services as at 31 December 2011, by region

Region/location	Number	Per cent
Arnhem	919	33.3
Central Australia	464	16.8
Darwin Rural	828	30.0
Katherine/Barkly	454	16.5
Hospital	24	0.9
Out of area[(a)]	68	2.5
Total	2,757	100

(a) Children who received a CHC within the prescribed areas then received dental services outside of the prescribed areas.

Note: Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

3 Preventive interventions and oral health promotion

Preventive interventions and oral health promotion activities are an important part of efforts to improve the oral health of Indigenous children. The CtG dental service provides a number of such programs, including oral health education and application of fluoride varnish.

Regular application of fluoride varnish is a clinical preventive intervention which has consistently been shown to reduce tooth decay (Marinho et al. 2002, Slade et al. 2011). CtG dental teams also frequently administer fissure sealants , which have been shown to be effective in preventing dental caries in high-risk individuals (Weintraub 2001).

In total, from August 2007 to December 2011, 5,307 children received preventive services and some of them received multiple preventive measures, including:

- 4,380 children attended oral health education sessions
- 2,035 children with full mouth fluoride varnish applications
- 923 children with fissure sealant applications.

In addition, a school-based tooth-brushing program was conducted in 14 schools and about 2,570 children participated in oral health education sessions, which were provided by outreach CtG dental teams and community-based oral health education programs.

In 2011, a program was also introduced to increase parental/caregiver engagement in children's oral health. The primary aim of the program was to ensure parents/caregivers attended children's assessment and treatment appointments. The program also provided the opportunity for outreach staff to better inform parents/caregivers of their child's oral health status and treatment needs and advise them about what actions they could take at home to maintain and improve oral health.

4 Oral health status of children who received dental services

This section describes the oral health of a group of children who received dental services in the prescribed areas of the NT, including the type of dental problems treated and DMFT/dmft results and it also provides a comparison with data from the 2006 Child Dental Health Survey (Ha et al. 2006).

4.1 Oral health problems treated

Among 6,480 children received dental service, 3,607 (56%) children were treated for at least one oral health problem. Untreated caries was the most prominent oral health condition, requiring treatment in 52% of children (Table 4.1). Mouth infections or sores and missing teeth were also treated in 5%, and dental abscess were treated in about 5% of children. Treatments for conditions such as gum disease, abnormal teeth growth, broken or chipped teeth due to trauma and missing teeth were less common. Other dental problems accounted for 3% of treatments provided.

Table 4.1: Types of dental problems of Indigenous children that were treated

	Total number of children	
Problem treated	Number	%
Untreated caries	3,365	51.9
Mouth infection or mouth sore	352	5.4
Dental abscess	339	5.2
Gum disease	161	2.5
Broken or chipped teeth due to trauma	78	1.2
Abnormal teeth growth	71	1.1
Missing teeth	15	0.2
Other	203	3.1
Sub-total number of children treated for at least one dental problem during dental service	3,607[(a)]	55.7
Sub-total number of children who did not received treatment or no dental health problem diagnosed during dental service	2,873	44.3
Total number of children who received dental service	**6,480**	**100.0**

(a) The sum of the columns does not add up to the sub-total because one child can recieve treatment for multiple conditions.

Note: Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

4.2 Changes in oral health over time

It is important to assess whether the treatment received by children has resulted in any changes in oral health. Table 4.2 shows changes in the prevalence of the most common oral health conditions among a group of children who received two or more courses of dental care. In common dental practice, children may be treated over several consecutive occasions of services within one course of care. The duration of a course of care may vary according to the child's oral health. As information on children's courses of care is not available in the CHC dental data collection, in this analysis *course of care* is defined as any occasion of service which occurs within a 90 day period. However, the duration of one course of care may vary in actual practice and in some cases may exceed 90 days.

In this analysis, we compared the prevalence of major oral health conditions between the first course and latest course of dental care. The *first course of dental care* is defined as the child's first dental service and all other dental services received within 90 days of the first service. Similarly, the *most recent course of care* is defined as a child's most recent service and all other dental services received up to 90 days prior to the latest service. There were 1,508 children who had two or more courses of dental care. The minimum time interval between the first and latest courses of care was 9 months and the median time interval was 21 months.

In total, 1,508 children had at least two courses of dental cares. About 54% of these children had at least one oral health problem diagnosed during their first course of dental care, and this had decreased to 41% by the most recent course of care. The overall prevalence for children with at least one oral health problem was decreased by 13 percentage points. The most commonly treated oral health problems in the first course of care were untreated caries (51%) and mouth infections (7%). At their latest course of dental care, there was a decrease of 14 percentage points for untreated caries and about 6 percentage points for mouth infections. All these changes were statistically significant.

Table 4.2: Changes in oral health conditions among children who received two or more courses of dental care

Oral health condition[a]	First course of dental care[b]		Last course of dental care[c]		Change in prevalence (95%CI)[d]
	Number of children	Per cent	Number of children	Per cent	
Children with at least one dental problems	809	53.6	619	41.0	-12.6 (-16.1 – -9.1)
Untreated caries	766	50.8	560	37.1	-13.7 (-17.2 – -10.2)
Mouth infection or mouth sores	104	6.9	21	1.4	-5.5 (-6.9 – -4.1)
Total number of children who received two or more courses of dental care	**1,508**	**100**	**1,508**	**100**	**n.a.**

n.a. not applicable.

(a) Refers to oral health condition treated during any occasion of service in one course of dental care.

(b) Refers to a child's first dental service and all other dental services recieved within 90 days of the first service.

(c) Refers to a child's most recent service and all other services recieved up to 90 days prior to the latest service.

(d) 95% Confidence interval.

Note: Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

The treatment outcomes were examined only for untreated caries and mouth infections or mouth sores because they were the only two oral health problems with sufficient numbers to conduct reliable statistical analysis. Table 4.3 shows that, among children who were treated for mouth infections or mouth sores at their first course of dental care, 97% did not show the same condition at their last course of care. Among children who were diagnosed with untreated caries, 60% did not have the condition at their last course of care. However, for children who still had untreated caries, it could not be determined if they were new or if they occurred in previously treated teeth.

Table 4.3: Treatment outcome for children with mouth infection and untreated caries at their first course of dental care

Type of condition	Total number of children with the condition at first course of care	Children without condition by last course of care		Children still had same condition at last course of care	
		Number	Per cent	Number	Per cent
Mouth infection/mouth sores	104	101	97.1	3	2.9
Untreated caries	766	461	60.2	305	39.8

Note: Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 31 December 2011.

4.3 Decayed, missing and filled teeth

Total number of decayed, missing and filled teeth (DMFT/dmft) is a widely used indicator of oral health status. It measures the number of decayed, missing and filled teeth of a person. For example, a DMFT/dmft score of 5 would mean that the person has a total of five decayed, missing or filled teeth. Standard notation is that DMFT refers to permanent teeth while dmft refers to deciduous teeth. Exfoliated deciduous teeth (where normal tooth loss has occurred) are not included as missing teeth.

Due to data capture problems, information on decayed, missing and filled teeth (DMFT/dmft) was only available for 939 children who received a dental service between 1 January and 30 June 2011. This represents 78% of all children who received a dental service during that period (Table 4.4).

Of these children, 773 (82%) had a DMFT/dmft score of more than zero, which indicates that they had caries experience.

The mean DMFT+dmft score indicates the average number of decayed, missing and filled teeth per person. Overall, the mean DMFT+dmft score was 4.5 among these children. However, the mean DMFT/dmft scores varied between different age groups. Among children with deciduous teeth, the highest dmft score (6) was in children aged 5, while the highest DMFT score (6) for permanent teeth was in children age 14.

Table 4.4: Number of decayed, missing and filled teeth, and mean number of deciduous dmft, permanent DMFT and total DMFT/dmft, children aged 0–17

Age group (years)	Number of children	Mean dmft for deciduous teeth	Mean DMFT for permanent teeth	Mean DMFT+dmft	Number of children with DMFT/dmft >0	Per cent of children with DMFT/dmft >0
0–3	89	3.6	n.a.	3.6	59	66.3
4	73	5.0	n.a.	5.0	59	80.8
5	98	6.0	n.a.	6.0	87	88.8
6	106	5.7	0.1	5.8	98	92.5
7	86	5.0	0.5	5.4	74	86.0
8	87	4.1	0.8	4.9	73	83.9
9	101	3.3	1.0	4.3	88	87.1
10	91	2.3	1.8	4.1	78	85.7
11	65	0.1	1.7	1.7	41	63.1
12	50	n.a.	3.1	3.1	36	72.0
13	29	n.a.	3.4	3.4	26	89.7
14	25	n.a.	6.0	6.0	23	92.0
15–17	39	n.a.	4.0	4.0	31	79.5
Total	**939**	**n.a.**	**n.a.**	**4.5**	**773**	**82.3**

n.a. not available.

Note: Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis NT DoH DMFT/dmft data 1 January to 30 June 2011.

A regional comparison of DMFT/dmft scores is shown in Table 4.5. The regional information collected is based on where children received treatment rather than the region in which they were living. However, as the majority of children who received treatment are likely to live in the local area, a regional comparison can be used as a proxy measure of the differences in dental health status among Indigenous children in these regions.

The proportion of children with a DMFT/dmft score above zero ranged from 77% in Darwin Rural region to 87% in Arnhem, and the mean DMFT/dmft score ranged from 3.4 in Darwin Rural to 5.5 in Katherine/Barkly.

A total of 43 children were treated in hospitals, mainly because they had multiple or severe oral health problems. A total of 86% of these children had a DMFT/dmft score greater than 0. Their mean DMFT/dmft score was 5.8, the highest of any group, indicating severe oral health problems.

Table 4.5: Percentage of children with DMFT/dmft>0 and mean DMFT/dmft by region, children aged 0–17

Region[(a)]/location	Children	DMFT/dmft >0 (%)	Mean DMFT/dmft
Arnhem	292	87.3	5.1
Central Australia	136	78.7	3.6
Darwin rural	256	76.6	3.4
Katherine/Barkly	212	84.0	5.5
Hospital[(b)]	43	86.0	5.8
Total	**939**	**82.3**	**4.5**

(a) Region where dental service was received.
(b) Received dental service in hospital.

Note: Data is presented only for those children whose parent or guardian provided consent.

Source: AIHW analysis NT DoH DMFT/dmft data 1 January to 30 June 2011.

4.4 National comparison

The DMFT/dmft scores from the CtG dental data were compared with Child Dental Health Survey (CDHS) data. These data sources have different methods of selecting children and were collected at different periods of time, and these factors should be considered when comparing DMFT/dmft scores. The data for the Child Dental Health Survey were collected from a random sample of children attending a School Dental Service in some states and territories (excluding New South Wales and Victoria) in 2006 (Ha et al. 2011). The data include both Indigenous and non-Indigenous children. In contrast, the DMFT/dmft data in the CHCI dental data collection was for 78% of children who received a service from January to June 2011, and these data include Indigenous children in the NT prescribed communities only.

Table 4.6 compares the caries experience of children aged 5–12 from the two data sources mentioned above. Of the children who received a dental service through the Closing the Gap Child Oral Health Program the proportion with dental caries was 23 percentage points higher compared with the children of the same age surveyed in the 2006 CDHS.

Children aged 5 who had a dental service through the program were more than twice as likely to have a caries experience as children of the same age in the CDHS, whilst there was almost no difference in the caries experience of 11 year olds. However, it must be noted that due to data capture problems, data detailing children's experience of caries were only available for a group of children who received dental services through the Closing the Gap Child Oral Health Program. For this reason the DMFT/dmft data may not be entirely representative of all children who had received a dental service.

Table 4.6: Comparison of combined caries experience (DMFT+dmft>0), Child Dental Health Survey 2006 and CHCI Dental Data Collection, aged 5–12 (per cent)

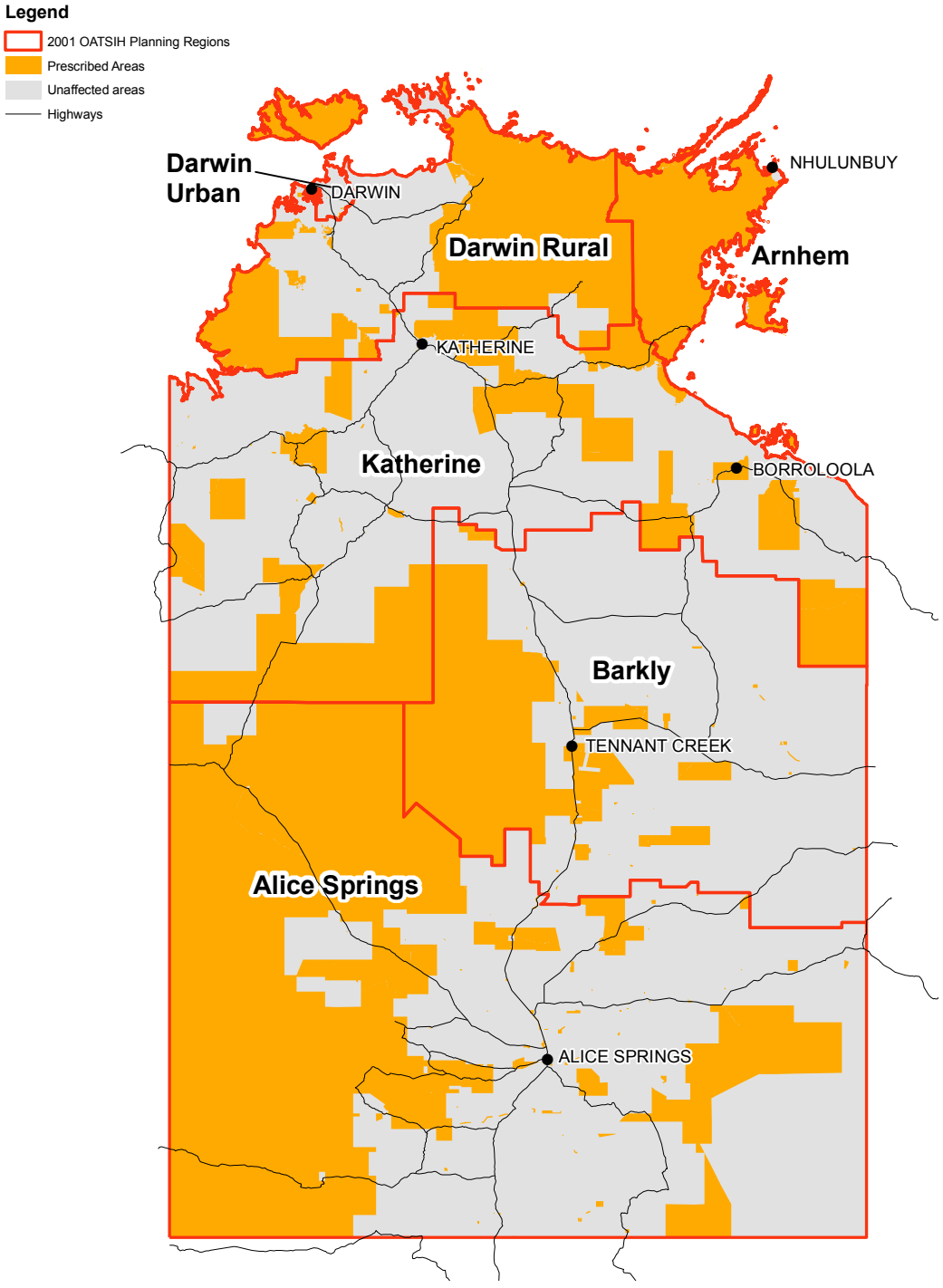
	Age (years)								Total
	5	6	7	8	9	10	11	12	DMFT+dmft>0
Percentage of children with combined caries experience (DMFT /dmft>0) from the Child Dental Health Survey 2006	41.0	63.0	61.6	67.0	62.0	59.0	62.6	54.0	59.4
Percentage of children with combined caries experience (DMFT /dmft >0) from Closing the Gap Child Oral Health Program dental services	88.8	92.5	86.0	83.9	87.1	85.7	63.1	72.0	82.4
Percentage difference between combined caries experience from CDHS 2006 and Closing the Gap Child Oral Health Program dental services	47.8	29.5	24.4	16.9	25.1	26.7	0.5	8.0	23.0

Note: Data is presented only for those children whose parent or guardian provided consent.

Sources: AIHW analysis NT DoH DMFT/dmft data 1 January to 30 June 2011, *Oral health and dental care in Australia: key facts and figures 2011* (Chrisopoulos S et.al 2011), Child Dental Health Survey 2006 (Diep H 2011).

Appendix 1: NTER Prescribed areas

Prescribed Areas *Northern Territory National Emergency Response Act 2007*



Appendix 2: The latest version of the dental data collection form

Instruction

Instructions for use:

This form is to be used to record information about dental services provided with funding provided by the Commonwealth Government as part of the Northern Territory Emergency Response (NTER) Child Health Check Initiative (CHCI).

Copies of completed forms should be sent to the Australian Institute of Health and Welfare (AIHW) as described below. The Department of Health and Ageing has contracted the AIHW to compile the information about the dental services on behalf of the Commonwealth Government.

Only one form per child can be accepted for any one day. Thus if any one child was seen on multiple occasions on any day, that information must be entered on to one form.

Consent:

Please ensure consent for data collection and transfer is gained prior to forwarding the information to the AIHW.

The form contains the words that should be used when asking for consent for the provision of data to the Commonwealth.

Process for sending forms to the Australian Institute of Health and Welfare:

- Make a copy of each form to send to the AIHW. Retain the original in the child's record.
- On the Monday of each week, please do the following:

1. Compile and securely package the forms completed during the previous week and either post or courier them to the AIHW as follows:

   Child Health Check
   Indigenous Determinants and Outcomes Unit, AIHW
   IF BY POST: GPO Box 570, Canberra ACT 2601
   IF BY COURIER: 26 Thynne Street, Fern Hill Park, Bruce ACT 2617

2. Email the following information to the AIHW at **chci@aihw.gov.au**:
   - The community ID for the forms sent.
   - The date the forms were posted.
   - Number of forms provided.
   - A contact name and phone number the AIHW can use if the forms do not arrive.

NTER CHCI DENTAL SERVICES DATA COLLECTION FORM

1. Organisation details

Date of Service: ☐☐/☐☐/☐☐☐☐ (dd/mm/yyyy)

ID or name of Community or Town Camp where this service was provided:

☐☐☐☐☐

ID or name of Community or Town Camp where child is resident:

☐☐☐☐☐

2. Consent to provide information to the Commonwealth

This dental service is funded by the Commonwealth Government. Information relating to the dental services provided to you, including any treatment and follow up treatment you receive (for example, surgery) will be kept by your dentist and provided to the Australian Institute of Health and Welfare (AIHW). To ensure you receive any follow up services you need and to evaluate and improve this program, the AIHW may disclose the information it receives to the Commonwealth Government to enable this evaluation, improvement and follow up to occur. Your name will not be provided to the AIHW or the Commonwealth Government and your information will not be reported in any way which could identify you.

Consent given to provide information to the Commonwealth?

☐ Yes ☐ No

If consent is not obtained, no data to be sent to the AIHW.

3. Child's details

HRN: _____

DOB: ☐☐/☐☐/☐☐☐☐ (dd/mm/yyyy)

SEX: ☐ Male ☐ Female

NTER CHCI DENTAL SERVICES DATA COLLECTION FORM

HRN:_____ Date of service:_____

4. Dental services provided

Indicate all services provided during this occasion of service

☐ 0: Diagnostic
☐ 1: Preventive
☐ 1(a): Full mouth fluoride
☐ 2: Periodontic
☐ 3: Surgery/Exodontia
☐ 4: Endodontic
☐ 5: Restorative
☐ 6: Crown or bridge
☐ 7: Prosthetics
☐ 8: Orthodontic
☐ 9: Other – please specify_____

5. Problems treated

Indicate all problems treated during this occasion of service

☐ 1: Assessment only
☐ 2: Oral health education
☐ 3: Untreated caries
☐ 4: Gum disease
☐ 5: Broken or chipped teeth due to trauma
☐ 6: Abnormal teeth growth
☐ 7: Missing teeth
☐ 8: Mouth infection or mouth sores
☐ 9: Dental hygiene (including plaque and calcification)
☐ 10: Dental abscess
☐ 11: Other – please specify_____

6. dmft/DMFT and dmfs/DMFS scores

dmft: if less than 11 years old	d		m		f		dmft	
DMFT: if 7 years or over	D		M		F		DMFT	
dmfs: if less than 11 years old	d		m		f		dmfs	
DMFS: if 7 years or over	D		M		F		DMFS	

7. Follow-up requirements

Does this child require further follow-up in order to complete their treatment plan? ☐ Yes ☐ No

8. Referred for GA ☐ Yes ☐ No

Glossary

Deciduous teeth: Develop during the embryonic stage of human development and erupt—that is, they become visible in the mouth—during infancy. They are usually lost and replaced by permanent teeth, but in the absence of permanent replacements, they can remain functional for many years.

Dental caries: An infectious disease that can lead to cavities (small holes) in the tooth structure that compromises both the structure and the health of the tooth.

Diagnostic: Examinations (initial, periodic and emergency oral exams; consultations; written reports; referrals). Radiographical examination and interpretation (intraoral radiographs; skull radiographs). Other diagnostic services (bacteriological examination; antibiotic sensitivity test; biopsy; casts).

Endodontics: Pulp treatments (pulp capping; pulpotomy; extirpation or debridement of root canal).

Fissure sealants: Thin plastic coatings that are applied to the grooves on the chewing surfaces of the back teeth to protect them from tooth decay.

Periodontics: Treatment of gums (treatment of acute infection).

Prescribed areas: The communities were prescribed under Northern Territory Emergency Response.

Preventive: Dental prophylaxis (removal of plaque; removal of calculus; recontouring of existing restorations). Topical fluoride (application of fluoride solution or gel; instruction on self-application). Other preventive services (dietary advice; oral hygiene instruction; fissure sealing; mouthguards).

Restorative: Amalgams (filling of 1, 2, 3+ surfaces). Glass ionomer, silicate and composite resins (filling of 1, 2, 3+ surfaces).

Surgery: Extractions (removal of permanent or deciduous tooth, tooth fragment).

References

AIHW (Australian Institute of Health and Welfare) 2011. Dental health of Indigenous children in the Northern Territory: findings from the Closing the Gap Program. Cat. no. IHW 41. Canberra: AIHW.

AIHW & DoHA (Department of Health and Ageing) 2009. Progress of the Northern Territory Emergency Response Child Health Check Initiative: update on results from the Child Health Check and Follow-Up Data Collections. Cat. no. IHW 28. Canberra: AIHW.

AIHW DSRU (Dental Statistics and Research Unit) 2000. Oral health and access to dental services among Indigenous Australians: Research report, March 2000. Cat. no. DEN 63. Adelaide: The University of Adelaide.

Chrisopoulos S, Beckwith K & Harford JE 2011.Oral health and dental care in Australia: key facts and figures 2011. Cat. no. DEN 214. Canberra: AIHW.

Couzos S & Murray R 2003. Aboriginal primary health care: an evidence-based approach, 2nd edn. Melbourne: Oxford University Press.

Ha DH, Roberts-Thomson KF & Armfield JM 2011. The Child Dental Health Surveys Australia, 2005 and 2006. Dental statistics and research series no. 54. Cat. no. DEN 213. Canberra: AIHW.

Marinho VCC, Higgins JPT, Logan S, Sheiham A 2002. Fluoride varnishes for preventing dental caries in children and adolescents. Cochrane Database of Systematic Reviews 2002, Issue 1. Art. No.: CD002279. DOI: 10.1002/14651858.CD002279.

Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S & Ndiaye C 2005. The global burden of oral diseases and risks to oral health. Bulletin of the World Health Organisation 83(9): 661–9.

Steering Committee for the Review of Government Service Provision 2003. Overcoming Indigenous disadvantage: key indicators 2003. Productivity Commission, Canberra.

Slade GD, Bailie RS, Roberts-Thomson K, Leach AJ, Raye I, Endean C, et al. 2011. Effect of health promotion and fluoride varnish on dental caries among Australian Aboriginal children: results from a community-randomized controlled trial. Community Dent Oral Epidemiol 39(1): 29–43.

Weintraub JA 2001. Pit and fissure sealants in high-caries-risk individuals. Journal of Dental Education 65(10): 1084 -1090.

Weintraub JA, Ramos-Gomez F, Jue B, Shain S, Hoover CI, Featherstone JDB & Gansky SA 2006. Fluoride varnish efficacy in preventing early childhood caries. Journal of Dental Research 85(2): 172–6.

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Related publications

Australian Institute of Health and Welfare 2011. Dental health of Indigenous children in the Northern Territory: findings from the Closing the Gap Program. Cat no. IHW41. Canberra: AIHW.

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