5 Follow-up: dental

5.1 Introduction

The May 2008 Northern Territory Emergency Response (NTER) Child Health Check Initiative (CHCI) progress report found that 43% of the children who had received a CHC had been identified as having some kind of oral health problem. In response to these findings, the Australian Government has funded the Northern Territory Department of Health and Families (NT DHF) and several Aboriginal Community Controlled Health Organisations (ACCHOs) to undertake follow-up dental services as part of the CHCI. These services are being provided by outreach teams of dental clinicians from the NT DHF and ACCHOs to children who had a CHC, as well as to other Indigenous children aged 15 years or less who live within the prescribed areas of the Northern Territory. The remaining references to NT DHF in this chapter refer specifically to its Helping Hands Oral Health Team.

This chapter presents the number of dental services that were provided to the Indigenous children in the prescribed areas by 30 June 2009. It also describes the demographic characteristics of those children who participated in the CHCI Dental data collection. Key findings from the analysis of the dental data are also presented, followed by further analyses conducted by comparing the CHC and dental databases. In addition, it provides some insight into the interpretation and limitations of the CHCI dental data collection. A glossary of dental data terms used throughout this chapter is provided at the end of this report.

5.2 Information about the CHCI dental data collection

Information for the dental data collection is transferred to the AIHW both in paper and electronic format. The information captured as part of the collection includes:

- details about the child (HRN, date of birth and sex)
- community ID
- type(s) of services provided
- problem(s) treated
- whether any further actions were required at the end of the occasion of service
- the number of deciduous decayed, missing and filled teeth/surfaces(for children aged 0 to 10 years)
- the number of permanent decayed, missing and filled teeth/surface(for children aged 7 years and over).

Information on the last two points above is not yet available for the majority of services conducted by either the ACCHOs or the NT DHF and is therefore not presented in this report.

Two types of measurements are used in this chapter: 'dental check' and 'a child'. 'Dental check' is used as the unit of measurement of dental services provided. It is based on an 'occasion of service', which refers to occasions of examination, consultation, treatment or

other service provided to a patient. Another unit of measurement 'a child' is used to present the oral health outcomes of children based on findings from the dental checks.

5.3 Interpretation and limitations of the CHCI Dental data collection

Data coverage for the CHCI Dental data collection is limited to data collected from the dental services provided by the NT DHF Helping Hands Oral Health Team and ACCHO dental outreach teams. However, a very small number of unit records relate to occasions of service provided by other NT DHF Oral Health Services. 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 CHC at which they had been aged 15 years or less.

When interpreting data from this collection, it should be noted that the children who received a dental check were not a random sample. Firstly, dental checks were only provided to children who volunteered for them. Secondly, 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. It should also be noted that consent forms were provided for dental treatment for all of these children. Diagnostic checks were sometimes provided in a separate occasion of service from the relevant treatment services. This means that there are more occasions of service than might be the case if these occurred at the same visit. If treatment was required, this was often done in a second visit within a few days of the first, upon receipt of a consent form for treatment signed by a parent or guardian.

It should be also noted that a considerable number of children who received the dental services did not give consent for sharing their dental health information with the AIHW. The NT DHF therefore provided total numbers for categories for these dental services to the AIHW for the purpose of monitoring dental services, rather than data consisting of individual records. Because of this, data for these children were not able to be linked to the CHC database. As such, apart from Table 5.1, the data in this chapter are only derived from dental service information for which consent was obtained, and therefore the true proportion of children who had dental referrals at their CHC and received follow-up dental services is higher than is reported here.

As a result of these limitations, the number of follow-up dental services described in this report is understated. More information about data quality and interpretation can be found in Appendix 2 of this report.

5.4 Dental forms received and processed

Information about the dental services provided through ACCHOs is sent to the AIHW on paper forms. Information about dental services provided by the NT DHF is transmitted to the AIHW in a secure electronic format.

In total, 3,738 dental records had been received by the AIHW that related to services conducted on or before 30 June 2009. 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 5.1). Among these records, 428 dental records were supplied by ACCHOs that received NTER funding to provide dental follow-up services; these services were provided to 262 children. It is possible that some ACCHOs provided follow-up dental services independent of NTER funding arrangements, but these data are not available to the AIHW. All remaining dental data was provided by NT DHF.

According to the data provided by NT DHF, there were 1,006 children for whom consent was not obtained and who received follow-up dental care across 1,498 occasions of service (Table 5.1).

Table 5.1: 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[(a)]
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*
Total checks with consent	3,608	70.7	2,349	100.0
Dental checks without consent	1,498	29.3	1,006	. .
Total number of dental checks	**5,106**	**100.0**	**3,355**	**. .**

. . Not applicable

(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.

Table 5.2 shows that the largest proportion of dental records has been received from the Arnhem region (35%), while 23% were received from Central Australia, 22% from Darwin Rural and 18% from the Barkly and Katherine regions combined.

Table 5.2: Number of dental forms received[(a)], by region

Region	Number	Per cent
Arnhem	1,274	35.3
Central Australia	816	22.6
Darwin Rural	795	22.0
Katherine/Barkly	630	17.5
Hospitals	93	2.6
All Regions	**3,608**	**100.0**

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

Source: AIHW Community log for services on or before 30 June 2009.

5.5 Demographic characteristics

As shown in Table 5.3, of the 2,349 children who received a dental check, 33% received a check in Arnhem, 24% in Central Australia, 22% in Darwin Rural, and 18% received a check in the Barkly or Katherine regions. Note, however, that sometimes the child's 'home community' (community in which the child lives) was recorded instead of the community in which the check was conducted. It is unclear to what degree this occurred or how often the child's 'home community' was in a region other than the one in which they received their dental check.

Table 5.3: Demographic characteristics, Indigenous children who had a dental check as part of the NTER CHCI

	Children	
	Number	Per cent
Region		
Arnhem	770	32.8
Central Australia	571	24.3
Darwin Rural	516	22.0
Katherine/Barkly	426	18.1
Hospitals	66	2.8
Total	**2,349**	**100.0**
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
Total	**2,349**	**100.0**

(continued)

Table 5.3 (continued): Demographic characteristics, Indigenous children who had a dental check as part of the NTER CHCI

	Children	
	Number	**Per cent**
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.

Nearly one in four (24%) of the children who had 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 5.3). Data on age group is missing for less than 1% of checks. An equal proportion of boys and girls had had a dental check (both 50%).

5.6 Dental services provided and problems treated

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%) of the 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 periodontic service, endodontic service, orthodontic service, or work on a crown or bridge. No children received a prosthetics service. Seven percent of children received some other type of treatment (Table 5.4).

Table 5.4: 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[(a)]	**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
Periodontic	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**

(a) See Glossary for a description of different dental services.

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. Nine per cent of children who received a dental check were treated for other problems (Table 5.5).

Table 5.5: 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**	**. .**

. . Not applicable.

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.

5.7 Further action required

As part of the dental check, health professionals were asked to assess whether further follow-up was required. Approximately one-third (35%) of children who received an NTER CHCI dental check were assessed as requiring further follow-up. As shown in Table 5.6, the Arnhem region had the greatest proportion of occasions of service requiring follow-up (51%), followed by Darwin Rural (41%). About the same proportion of occasions of service required follow-up in Katherine and Barkly and in Central Australia (22%).

Table 5.6: Children requiring follow-up treatment at latest dental check, by region

Region	Children requiring follow-up		Total number of children
	Number	Per cent	
Arnhem	396	51.4	770
Central Australia	124	21.7	571
Darwin Rural	210	40.7	516
Katherine/Barkly	92	21.6	426
Hospitals	<5	n.a.	66
Total	**825**	**35.1**	**2,349**

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

n.a.: Not available, because the numbers of children in these categories was very small.

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

5.8 Dental follow-up services among children with a CHC

As the four NTER CHCI data collections become more complete, it becomes possible to track a greater number of children between the collections. Of particular interest is how many children in the CHC data collection have received follow-up dental treatment since their CHC, especially for those children who were identified as having oral health problems and who also received a referral for follow-up dental services[3].

To do this, dental health information from children's first CHC and first dental check was compared. In order to link the CHC and Dental data collections, valid and unique HRNs are required in both collections. Among the 10,605 children who had received a CHC as at 30 June 2009, 366 CHC forms with missing or 'incorrect' HRNs were removed for linkage purposes. The number of children in the final CHC data set used for the linkage of collections differs between Sections 5.8 and 5.9. Section 5.8 excludes children who had completed a non-standard CHC form where no oral health status and referral information was available whereas Section 5.9 includes children who had completed a non-standard form. For children who had two valid CHCs, only their first valid CHC was used for linkage purposes because follow-up services are based on the referrals that were made during the child's initial health check. The total number of children included in the final CHC data sets for Sections 5.8 and 5.9 was 9,137 and 10,239, respectively.

The 9,137 children included in the CHC linkage database for Section 5.8 differs from the final CHC data set used for the analyses of health conditions and referrals presented in Chapter 2 of this report (9,373 children) because the CHC data set used for linkage purposes excludes CHC forms with missing or 'incorrect' HRNs that were otherwise included in analyses.

Once a linkage data set was established using valid CHC records, this could be used to locate particular children present in the dental database and trace their dental follow-up status.

[3] The definition of 'oral health problem' in the CHC data collection includes: untreated caries; gum disease; broken or chipped teeth; abnormal teeth growth; missing teeth; mouth infection and sores; and plaque and poor dental hygiene.

However, getting the most accurate results with this method requires a complete unit record-level dental database, which is not currently the case. As previously discussed, there are a large number of children (1,006) who are known to have received a dental check but for whom explicit consent was not given for their unit record data to be provided to the AIHW. Information on these children can therefore only be provided in aggregate form to the AIHW, and matching these children to the CHC linkage database must be done by DHF. It is not possible to present disaggregated information on these children in this report.

Of the 2,349 children who had had at least one dental check as at 30 June 2009 for which consent was given to provide the AIHW with unit level data, the HRN was missing for 57 of these records and these could not be linked with the CHC database. In total, data from the Dental collection for 2,292 children could be used in the linkage of data sets. As was done for the CHC data, for those children who had had more than one dental check, only the first of their dental checks was included for data linkage purposes.

5.8.1 Oral health and dental referral status

Data linkage performed by the DHF on the total number of children who have received dental services has shown that almost two in five (38%) of the children who were referred for dental services at their CHC had received at least one follow-up dental check on or before 30 June 2009. This proportion represents the most accurate picture of current dental follow-up care for children who had a CHC.

In this report, however, the AIHW can only present detailed information on a subset of these children: those for whom consent was given to collect unit level data. The following proportions are based on this smaller subset of children. It should be noted that these proportions are understated due to the exclusion of the 1,006 children who did not provide consent. According to the unit record data that the AIHW has received, one in four (25%) children who had received a dental referral at the time of their CHC had received at least one follow-up dental check on or before 30 June 2009.

Of the 9,137 children who had had a CHC as at 30 June 2009, 3,950 children were identified as having an oral health problem, 5,187 children had no oral health problems or information on oral health problems was missing. Table 5.7 shows the dental referral status and dental check follow-up of children who had had a CHC, split according to whether or not they were identified as having an oral health problem at the time of their CHC. Overall, the proportion of children who had had a dental check and gave consent for this information to be provided to the AIHW was larger among those who had an oral health problem at CHC (24%) compared with those who did not (12%), regardless of whether they were referred for such services at their CHC. As expected, there were many more children with an oral health problem who were referred for dental services (2,961) than those with no oral health problem or missing data about oral health problems (262) at the time of their CHC (Table 5.7).

Of those children who had an oral health problem at the time of their CHC and were referred for dental services, 25% had received a dental check for which information could be provided to the AIHW (Table 5.7). Of those children who had not been referred for dental services, or for whom referral information was missing, there was a larger proportion of children with oral health problems who had received a dental check (20%) than those children with no recorded oral health problem (12%).

Table 5.7: Dental referral status at CHC by whether dental check follow-up had been received and oral health status of Indigenous children who had a Child Health Check as part of the NTER CHCI

	Children who had a dental check		Total children
	Number	Per cent	Number
Children with an oral health problem at CHC			
Children with a dental referral	751	25.3	2,961
Children with no dental referral or for whom referrals information was missing[(a)]	202	20.4	989
Total children with oral health problem	*953*	*24.1*	*3,950*
Children with no oral health problem or missing[(b)] oral health problem data at CHC			
Children with a dental referral	55	20.9	262
Children with no dental referral or for whom referrals information was missing[(a)]	568	11.5	4,925
Total children with no oral health problem or missing data	*623*	*12.0*	*5,187*
Total children with dental referral	*806*	*25.0*	*3,223*
Total children	**1,576**	**17.2**	**9,137**

(a) Missing includes unsure, not stated and not tested responses.

(b) Children with missing data on oral health make up 10.1% of the total children who had undertaken a CHC.

Note: These figures are based on each child's first dental and CHC checks. This table only includes data on children for whom consent was given to provide unit record level information to the AIHW.

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

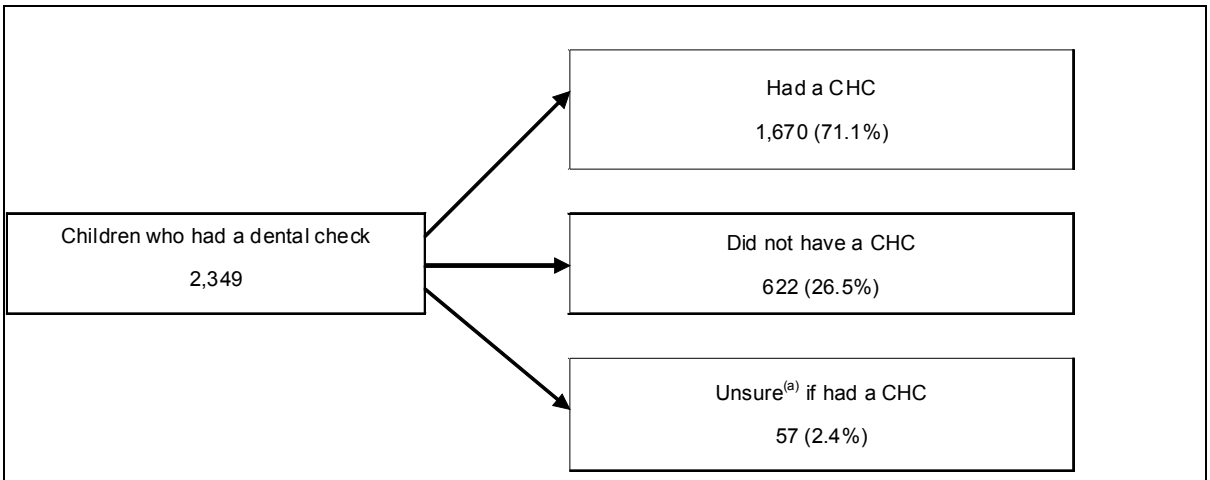
5.9 Dental check results for children with or without a Child Health Check

Figure 5.1 shows the percentage of children who had had a dental check, who had also had a Child Health Check first. About seven in 10 (71%) children who had a dental check had previously had a CHC. There were 57 dental checks for which a HRN was not provided; therefore, it was not known if the children who had these checks had previously had a CHC.

Table 5.8 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 5.8 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). For more information about the interpretation and limitations of the CHCI Dental data collection, see Section 5.3 or Appendix 2.



(a) Includes those children who had a dental check but were missing an HRN and could not be linked to the CHC database.

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

Figure 5.1: Dental check and Child Health Check status, Indigenous children who had a dental check as part of the NTER CHCI

Table 5.8: 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**	**..**

.. Not applicable

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.

5.10 Summary and discussion

There were 3,355 children who received a dental health check as part of the NTER CHCI. Detailed data on services and treatment were available for 2,349 of these children.

Among these children:

- Ninety-three per cent (2,185) received a diagnostic service, 59% (1,385) received a preventative service, 50% (1,183) received a restorative service and 16% (366) received a surgical service.
- Fifty-four per cent (1,268) had treatment for untreated caries; 50% (1,177) were provided with oral health education; 24% (574) were treated for inadequate dental hygiene (including plaque and calcification); 6% (134) were treated for mouth infection or mouth sores; and 3% (67) were treated for gum disease.
- Thirty-five per cent (825) were assessed as requiring further follow-up treatment.

Of the 3,223 children who had received a referral to dental follow-up services during their CHC, 38% had received a dental check (though only 25% of those for whom the AIHW had detailed data had received a dental check):

The proportion of children who had received a follow-up dental check was higher among those children who had an oral health problem (24%) compared with those who did not (12%).