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Dental health of Indigenous children in the Northern Territory

Findings from the Closing the Gap Program

March 2011

Australian Institute of Health and Welfare
Canberra

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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
HRN	hospital registration number
NTER	Northern Territory Emergency Response
NPA	National Partnership Agreement
NT	Northern Territory
NT DoH	Northern Territory Department of Health
OHSNT	Oral Health Services-Northern Territory
RAHC	Remote Area Health Corps

Summary

About this report

This report presents findings from the dental follow-up data collection that was established as part of the *Closing the Gap in the Northern Territory National Partnership Agreement* (NPA) between the Australian and Northern Territory governments to monitor dental services in communities in prescribed areas of the Northern Territory. These findings can be used to support public accountability for the delivery of dental services provided through the NPA.

The report provides information on the following aspects of dental services delivered from August 2007 to June 2010, including the:

- amount and types of dental services provided;
- extent of follow-up care provided to children with dental referrals;
- oral health status of children who received dental services.

Key findings

There are some data limitations that affect the findings of this report. Although the data collection covered the majority of dental services, it does not contain information on services provided by some of the service providers. The analyses presented also exclude information on children who did not consent to share their dental health information with Australian Institute of Health and Welfare (AIHW). The DMFT (decayed, missing or filled teeth) data only covers children receiving a service in the period March–December 2009 due to several issues detailed later in the report. While the data are subject to these limitations, the report still shows that:

- A total of 9,581 occasions of service were provided to 6,002 children by June 2010 through the Closing the Gap Program. While the program was slow to start in 2007–08 – when 868 occasions of service were provided – for the last two financial years 2008–10 more than 4,200 occasions of services were provided in each year.
- During the Northern Territory Emergency Response (NTER) Child Health Check Initiative (CHCI) in the areas covered by the Closing the Gap Program 3,224 children received a dental referral. According to the AIHW dental data collection, 1,946 of these children with a referral from their health checks were seen by June 2010. The average waiting time between referral and the receipt of service among this group of children was 14.3 months.
- Of the 6,002 children who received a dental service, 4,345 children consented to sharing their treatment data with the AIHW. The analyses could be undertaken on data from 4,281 children which showed that 55% (2,368) of them were identified at initial consultation as requiring further dental care.
- Of the 2,368 children requiring follow-up care, 66% (1,570) were seen by a dental health professional. The high mobility of Indigenous children in these areas presents a great challenge to provide follow-up services. For example, at the time of dental service, 39% of children were living in a community different to the one they were at when they received the health checks.

- According to data provided to the AIHW, almost all children receiving a dental service received a diagnostic service. The most common services provided include preventative (70%) and restorative (48%) services, followed by fluoride varnish (16%) and dental surgery (16%).
- Due to data capture problems, information on decayed, missing and filled teeth (DMFT/dmft) was available for 32% (1,939) of children who received a dental service. Of these children 83% (1,612) had some decayed, missing or filled teeth. The prevalence of decayed, missing or filled teeth among these children is much higher than for comparable Northern Territory or Australian children from the National Child Dental Health Survey.

The high prevalence of oral health problems and a significant number of follow-up services required indicate that there is a considerable need for dental services among these children that is expected to continue into the future.

1 Introduction

1.1 Background

Indigenous Australians have consistently been found to have worse oral health outcomes than other Australians. They are more likely to have lost all their teeth and have gum disease compared with other Australians (AIHW: DSRU 2000). Also, Indigenous Australians are more likely to have untreated dental caries and dental disease and less likely to have received preventive dental care. Poor oral health outcomes can have a widespread impact on a person's health and wellbeing, including an increased risk of poor nutrition and chronic disease, adversely affecting self-esteem and speech and language development (AIHW:DSRU 2000, Couzos & Murray 2003, SCRGSP 2003).

The poor oral health of Indigenous children was confirmed by Child Health Checks (CHCs), which found that 43% of children had an oral health problem (AIHW & DoHA 2009). The most prevalent problem was untreated caries (40% of all children), followed by gum disease (5% of all children). Thirty-five per cent of children that were given a CHC were referred for dental services.

The CHCs were part of the Child Health Check Initiative (CHCI), which is one component of the health-related measures introduced under the Northern Territory Emergency Response (NTER). 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).

In response to these oral health problems, the CHCI included funding for follow-up dental services. The Australian Government funded the Northern Territory Department of Health (NT DoH) and six Aboriginal Community Controlled Health Organisations (ACCHOs) to provide eligible children with dental services using outreach teams of dental professionals. The ACCHOs were Katherine West Health Board, Laynhapuy Homelands Association Incorporated, Marthakal Homeland and Resource Centre Australia, Danila Dilba Health Service, Wurli Wurlinjang Health Service Aboriginal Corporation and Miwatj Health Aboriginal Corporation.

The dental follow-up services operate in prescribed areas of the Northern Territory where the CHCs were conducted. Eligible children are those living in the prescribed areas, who:

- had received a Child Health Check or
- were under 16 years of age.

The follow-up dental services are provided by a team of dental professionals, a dental therapist or dentist and a dental assistant who visited communities with a list of children who had received referrals at their health checks. However their services are not limited to children who had received health checks. Dentists were also engaged to provide dental surgery for those children requiring more extensive or complex care that could not be provided in a regular clinic setting.

The follow-up dental services are now part of the Closing the Gap (CtG) in the Northern Territory National Partnership Agreement between the Australian and Northern Territory governments, that was signed in July 2009¹.

1.1.1 NT DoH dental services and infrastructure

Oral Health Services-Northern Territory (OHSNT), part of NT DoH, is the primary provider of public dental services in the Northern Territory. The OHSNT provides oral health services including pain and trauma management, emergency care, restorative fillings, endodontics, extractions, oral hygiene, oral health promotion and prosthetic services. Specialist services provided include orthodontics, minor oral surgery, treatment in hospitals under general anaesthesia and some periodontics.

Services are provided free of charge to eligible clients including infants and children up to the end of secondary school, holders of current Centrelink issued Health Care Cards and Pensioner Concession Cards. People living in remote communities more than 100 kms from a private dental provider are eligible for emergency care.

All oral health services provided are from a mix of multi-chair, single-chair and mobile clinics. Multi-chair community clinics are located at Darwin, Palmerston, Nhulunbuy, Katherine and Alice Springs. Single-chair clinics are located in primary schools in Darwin, Palmerston, Katherine, Tennant Creek and Alice Springs. Across the Top End (the northern part of the Northern Territory) the single-chair clinics are co-located with health centers in most remote communities. In Central Australia six communities have an onsite dental clinic with the remainder serviced by two mobile dental trucks.

Specialist orthodontic services are available in Darwin, Gove, Katherine and Alice Springs. Oral surgery services are available in Darwin and Alice Springs. Treatment under general anaesthetic is provided in Darwin, Gove, Katherine, Tennant Creek and Alice Springs.

The large size of the Northern Territory (NT), it covers an area of about 1.3 million km² or around seven times the size of Victoria, produces challenges to service provision in remote communities. The frequency of services to remote communities is influenced by population size, transport and accommodation availability, road and weather conditions and staffing levels. Communities across the Top End are serviced out of Darwin and Nhulunbuy with staff traveling by 4WD to closer communities (up to 4 hours drive), and by chartered light aircraft or scheduled commercial flights (up to 3.5 hours flight time). In the Katherine area communities are serviced by staff based in Katherine traveling by road. And in Central Australia and the Barkly region staff based in Alice Springs provide dental services by road with travel times of up to 9 hours.

Indigenous children under 16 years of age who were referred through the CHCs, and who reside in prescribed communities, are eligible for oral health care and treatment under funding provided in Schedule F of the National Partnership Agreement on Closing the Gap in the Northern Territory.

The Closing the Gap Child Oral Health Program sits within OHSNT and provides outreach services and treatment under general anesthetic to this population group. These outreach services are provided by dental therapists, dentists and dental assistants – employed by the

¹ This report encompasses services provided under both the CHCI and CtG programs. For clarity, the program is referred to as CHCI throughout the report.

Remote Area Health Corps (RAHC) – who visit the remote communities for 3-week blocks. This service delivery model increases the capacity for providing services without compromising the staffing of regular services. Oral health treatment under general anaesthetic is provided at NT public hospitals using a mix of local staff and staff provided through RAHC and through agreements with Westmead Children’s Hospital and the John James Foundation.

With funding from the CtG project, NT DoH has purchased two reloadable dental clinics, a mobile dental caravan, and a refurbished dental caravan from Queensland Health (currently at Hermannsburg). The funding also enabled the long-term lease of a mobile dental caravan from the South Australia Dental Service (currently at Ali Curung) and the lease of a mobile dental van from Queensland Health (lease period completed). Installation of clinics in Docker River and Kintore means that staff can travel there by light aircraft rather than road.

In the Top End both dentists and dental therapists conduct remote visiting services. In Central Australia, the additional travel distances and the smaller community size makes service provision by a dentist more efficient.

1.1.2 Aboriginal Community Controlled Health Organisations dental services

Although six Aboriginal Community Controlled Health Organisation (ACCHO) dental clinics provide dental services, complete data were only received from Laynhapuy Health Service. This section describes the services provided by three ACCHOs, Laynhapuy Health Service, Marthakal Health Service and Miwatj Health Aboriginal Corporation.

Laynhapuy Health Service has a long association with the local population in the Laynhapuy Homelands in East Arnhem. A homeland comprises members of related clan groups who live on their traditional land. Homelands have far less infrastructure than communities, they often have no shop and power only from a small generator. The Laynhapuy Homelands are also remote, requiring long travel distances at high cost to Nhulunbuy for food and fuel.

Laynhapuy Health Service engaged a full-time dental therapist (initially seconded from OHSNT) and a dental assistant to provide dental services to children as part of the CHCI. These services are much needed in the homelands, about 90% of children had never been seen by an oral health professional. Almost all children received a referral for a dental service from their CHC. The dental services are mainly provided by mobile services, which rotate equipment around five health clinics within the homelands. One health clinic also has fixed dental equipment. If there is no clinic, children are transported to the closest homeland with a clinic for treatment. The dental therapist and assistant spend about 3–4 months in each homeland, and so can provide a comprehensive course of care to children during that time, including preventative treatments. In addition to the mobile services, the single-chair OHSNT dental clinic at Yirrkala is sometimes used. Should a child require dental surgery, they are referred to OHSNT.

Marthakal Health Service, part of Marthakal Homelands Association, is located on Elcho Island and services the Marthakal Homelands in north-east Arnhem. It also has established dental services as part of the CHCI. The Marthakal Homelands Association employs a dentist and dental assistant who travel to the small homeland communities using portable equipment. Dental clinics are located in the three largest homeland communities, and clients in smaller communities are transported to these clinics for treatment. There is also an NT DoH dental clinic in the main township on the island.

Miwatj Health Aboriginal Corporation provides dental services to a number of nearby communities. A fixed dental clinic is located within the Ngalkanbuy clinic. Transport is available to bring children who live in nearby communities in to receive dental services.

1.2 Dental data collection

When the dental service occurs, the dental professional completes a questionnaire with information about the service provided and the child's demographic characteristics. The data are sent to AIHW in electronic and paper format.

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 children require further follow-up services to complete their treatment plan.

However, the data that the AIHW receives is dependent on the children's family providing consent for sharing the above information with the AIHW. There are three scenarios:

- If consent is given, all of the above dental service information is received.
- If consent is not given, only a limited data set sufficient to enable determination of follow-up to a referral was provided.
- If consent is not given and the child does not have a dental referral from the CHC, only the aggregate information on the number of services and the number of children by 5-year age group, sex and community is sent to the AIHW.

Over time the number of children for whom consent, to share their dental health information, was obtained has increased. In 2009–10 data were received in 95% of services.

The dental data collection has some limitations that should be considered when interpreting the data.

- Not all dental services provided through this funding program or provided to the target group were captured in this collection. Data collection from ACCHOs has not been complete and some children have received dental care through NT DoH's regular dental program.
- With consent arrangements, the AIHW only receives detailed information on dental services if the children's guardians give consent to sharing the information with the AIHW. Apart from the total number of services and the number of children who received services, other information in this report is representative of children for whom consent was obtained rather than all children who received dental services, although the AIHW has obtained consent for the majority of children (95% in 2009–10).
- Because the children's name is not provided, the AIHW can only track children using their HRN. A very small percentage of children (1.1%) cannot be tracked due to a missing or incorrect HRN. Therefore there may be some double counting of children, resulting in an over-reporting of children receiving dental services.

- The oral health data collected in the dental services includes a count of decayed, missing and filled teeth of each child to provide a DMFT/dmft score. Due to a database operation error in the DMFT/dmft data collated by NT DoH, DMFT/dmft may not represent the pre-treatment base chart on initial presentation but may be drawn from subsequent follow-up appointments. The DMFT/dmft can therefore not be used to accurately reflect untreated caries but does represent the overall decay experience. Due to the NT DoH data extraction problems, the DMFT/dmft data included in this report covers children receiving service in the period March–December 2009 only. DMFT/dmft data were received from ACCHOs (with consent provided) for all periods. Only ACCHOs DMFT/dmft data from March–December 2009 are included in the report to maintain data consistency.

1.3 Report overview and structure

The information in this report relates to dental services provided as part of the Child Health Check Initiative until 30 June 2010.

The main questions that this report seeks to answer are:

- How many dental services were provided and what proportion of eligible children in the prescribed areas of the Northern Territory received these dental services?
- What type of dental services were provided and what problems were treated?
- What proportion of children with a dental referral from their Child Health Check received follow-up dental services and, if they received a service, how long did they wait for the service?
- What is the oral health status of children receiving dental services, and how do they compare with national data?

After the Introduction, the report is divided into four chapters:

- Chapter 2, **Preventative interventions and health promotion**, describes the preventative and oral health promotion programs for children in the Northern Territory.
- Chapter 3, **Dental service delivery**, details the delivery of dental services, number and characteristics of children receiving these services, and the type of dental services provided.
- Chapter 4, **CHC dental referrals and follow-up service provision**, presents information on the follow-up services provided to children with a dental referral from their health check.
- Chapter 5, **Oral health status of children receiving dental services**, examines the oral health of children receiving these services, and literature on oral health of Indigenous children. The findings from the CHCI describe the type of problems treated, DMFT/dmft measures of children and the association between oral health of children and growth problems.

Appendix 1 presents the questionnaire used in the dental data collection.

Appendix 2 presents a map of communities covered by the CHCI dental program.

2 Preventative interventions and health promotion

Preventative interventions and oral health promotion activities comprise an important component of efforts to improve the oral health of Indigenous children. This chapter describes the programs that are implemented by NT DoH under the Closing the Gap in the Northern Territory Partnership Agreement to improve the dental health of Indigenous children in the Northern Territory. NT DoH refers to this as the Closing the Gap Child Oral Health Program.

2.1 Fluoride varnish

Fluoride is a naturally occurring mineral that can significantly reduce tooth decay. Access to fluoride can be through fluoridated water supplies, fluoride tablets, toothpastes and fluoride varnish. Much of Australia has fluoride added to reticulate water supplies, but not in most remote NT communities. In Central Australia most bore water has naturally occurring fluoride within or above the recommended range for oral health. In the Top End there are negligible amounts of naturally occurring fluoride in water supplies.

Fluoride varnish is a clinical preventative intervention for which regular application has consistently been shown to reduce tooth decay by an average of 33% (Marinho et al. 2002). This finding was most recently supported by a randomised control conducted in 30 remote Indigenous communities in the NT that found the regular application of whole-of-mouth fluoride varnish could reduce tooth decay by 31% (Slade et al. 2010). Analysis of fluoride data from 80 locations in the Northern Territory with Child Dental Health Survey data has also demonstrated that dental caries can be reduced by about 20% for children in communities with the lowest fluoride levels (Bailie et al. 2009).

A key component of the CtG Child Oral Health Prevention and Promotion Program is the application of whole of mouth fluoride varnish. Application of fluoride varnish is included into the regular visits of clinical outreach teams in the Top End. Information on fluoride protocols is included in the orientation for Top End CtG clinical outreach teams. The orientation package has been successful in ensuring all teams apply fluoride varnish to patients at high risk of dental caries. Outreach teams carried out 748 whole-of-mouth fluoride varnish applications between 1 July 2009 and 30 June 2010.

A limitation of the current model is that it does not ensure children receive repeat applications. But the program has started training registered nurses and Aboriginal health workers to apply fluoride varnish to at-risk children on a 6-monthly basis, thereby providing for repeat applications.

2.2 School-based toothbrushing programs

An important part of health promotion activities are school based toothbrushing programs, these are an effective way of helping children form habits of brushing teeth at school, at home and throughout life. The Health Promotion Officer, CtG Child Oral Health, provides school toothbrushing programs around the time that a CtG clinical outreach team visits a

remote community. This is considered an opportune time to provide these programs because community enthusiasm is high, and good oral hygiene can help maintain restorative work conducted by the clinical team.

The initial health promotion visit to a community establishes a regular toothbrushing program in the school if there is not one in place. If there is a program in place the visit aims to review and enhance the program as appropriate. Communities receive follow-up visits about once every 6 months, or on a 2-term basis, and aim to encourage community-based workers to help improve the program's sustainability.

As at 30 June 2010, six out of a target of ten school-based toothbrushing programs had been developed or enhanced in the communities of Warruwi, Barunga, Beswick, Palumpa, Milikapiti, and Pirlangimpi.

2.3 Other oral health promotion activities

Community based oral health education, conducted by the NT DoH Oral Health Promotion Officer and Closing the Gap outreach teams, aims to improve oral hygiene practices. From 1 July 2009 to June 2010, a total of 88 oral health education sessions were conducted and attended by 971 people.

A significant initiative was the inclusion of a 'Lift-the-Lip' assessment as part of the routine standard territory-wide Healthy Under-5 Kids assessment. This program will provide children aged less than 5 years a risk assessment and referral as required for oral health care.

Further oral health promotion activities also help community-based initiatives. The program has developed a number of Mine Shine posters, a Mine Shine sticker, and the Clean Teeth for Life DVD and poster package. The Clean Teeth for Life resources were uploaded to the Internet and are available from the NT DoH Oral Health website, the Australian Indigenous HealthInfoNet, and the Oral Health Promotion Clearinghouse².

Three culturally appropriate cartoon characters were developed for use on oral health promotional materials, including a range of stickers, posters, and brochures demonstrating good oral health behaviours. Children relate well to cartoon characters, which help with modelling their oral health behaviour and thereby improving their oral health. There is a need for more of these culturally appropriate resources for use in Indigenous communities in the Top End and Central Australia.

² See NT DoH Oral Health, <http://www.health.nt.gov.au/Oral_Health/Oral_Health_Promotion/index.aspx>, the Australian Indigenous HealthInfoNet <<http://www.healthinfonet.ecu.edu.au>>, and the Oral Health Promotion Clearinghouse <<http://www.adelaide.edu.au/oral-health-promotion>>.

3 Dental service delivery

This chapter details the provision of dental services to children as part of the CHCI. First, the number of dental services provided and children receiving these services are examined according to consent status, region, age and sex. This includes information on the proportion of children in the prescribed areas of the Northern Territory receiving dental services. Then the type of dental services and further dental care of children provided are analysed. This illustrates if children requiring additional services are receiving them.

3.1 Dental services provided and children who received services

In total, 9,581 dental services were provided to 6,002 children from August 2007 to 30 June 2010 (Table 3.1). The total number of dental services provided and Indigenous children who received services for the first time were similar in 2008–09 and 2009–10, after having increased substantially in 2007–08. The low number of services provided in 2007–08 was due to several issues, including the time needed for planning, recruiting a workforce and building or renting the infrastructure.

Table 3.1: Number of dental services provided and number of Indigenous children who received services for the first time, by consent status and financial year

Financial year	Services			Children seen first time		
	Consent	Non-consent	Total	Consent	Non-consent	Total
August 2007-June 2008	563 (64.9%)	305 (35.1%)	868 (100%)	503 (63.4%)	291 (36.6%)	794 (100%)
July 2008-June 2009	3,047 (68.6%)	1,395 (31.4%)	4,442 (100%)	1,853 (60.9%)	1,192 (39.1%)	3,045 (100%)
July 2009-June 2010	4,033 (94.4%)	238 (5.6%)	4,271 (100%)	1,989 (92.0%)	174 (8.0%)	2,163 (100%)
Total	7,643 (79.8%)	1,938 (20.2%)	9,581 (100%)	4,345 (72.4%)	1,657 (27.6%)	6,002 (100%)

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

About 28% of children’s families did not give consent for sharing information with the AIHW, and this accounts for about 20% of services provided. Non-consent services mainly occurred in the early stage of follow-up because of failure to return the consent form. Since July 2009, the NT DoH dental team has placed greater focus on the completion and return of consent forms to share data with AIHW. These efforts have included emphasising the importance of seeking consent during the orientation and training of outreach teams, sending consent forms to health clinics and schools prior to outreach teams arriving in the community, and greater assistance from Aboriginal Liaison Officers in following up parents and guardians for collection of completed consent forms. These efforts have resulted in an increased number of consent forms signed by parents/guardians, and therefore, a significant improvement in the amount of data captured.

Thirty-nine per cent of all children, accounting for one-quarter of all occasions of service, received one dental service (Table 3.2). A further 19% of children received two dental services, accounting for a further 24% of total occasions of service. Only 14% of all children received three or more dental services over the same period, which was 31% of all services.

Table 3.2: Number of dental services per child, Indigenous children who had a dental service

	Dental services		Children	
	Number	Per cent of all services	Number	Per cent of children
Dental services per child with consent				
1 dental service ^(a)	2,365	24.7	2,365	39.4
2 dental services	2,318	24.2	1,159	19.3
3 dental services	1,470	15.3	490	8.2
4 dental services	860	9.0	215	3.6
5 dental services	395	4.1	79	1.3
6 dental services	150	1.6	25	0.4
7+ dental services	85	0.9	12	0.2
Total services with consent	7,643	79.8	4,345	72.4
Dental services without consent	1,938	20.2	1,657	27.6
Total number of dental services	9,581	100.0	6,002	100.0

(a) Where invalid or missing HRN, reported as receiving 1 dental service.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

3.2 Demographic characteristics of children who received dental services

This section presents the demographic characteristics of Indigenous children in the prescribed areas who received a dental service from August 2007 to June 2010. A total of 6,002 children have received dental services, which is 37% of the total population aged under 16 years in the prescribed areas (Table 3.3). This proportion varies by the region where the service was provided. The highest proportion of children that received services was in Arnhem (45%), followed by Central Australia (41%). In Darwin Rural (29%) and Katherine/Barkly (27%) the coverage of dental services was the lowest.

The majority of children that received dental services were aged 6–11 years (58%), which was almost three times the proportion of children aged 0–5 years (21%) that received services (Table 3.4). Although the age of children eligible to receive dental services is limited to those aged under 16 years, there is an exception for children who were aged under 16 years at the time of the CHC and received a referral for a dental service, meaning they would still be eligible to receive a dental service at the age of 16 years or over.

Table 3.3: Number of Indigenous children receiving dental services and as a proportion of the population aged under 16 years, by region

Region ^(a)	Children	Population under 16 years ^(b)	Per cent of population under 16 years
Arnhem	1,511	3,350	45.1
Central Australia	1,610	3,934	40.9
Darwin Rural	1,402	5,188	27.0
Katherine/Barkly	1,100	3,787	29.0
Hospital ^(b)	197	n.a.	n.a.
Out of area ^(c)	182	n.a.	n.a.
Total	6,002	16,259	36.9

n.a. not available

(a) Region where received dental service.

(b) Estimated Indigenous resident population figures for children aged under 16 years who live in communities and town camps covered by the CHCI. These estimates were provided by the DoHA.

(c) Received dental service in hospital.

(d) Received dental service outside of prescribed area.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

Table 3.4: Number of Indigenous children that received dental services, by age and sex, where consent was provided

	Number	Per cent
Age group		
0–5 years	909	20.9
6–11 years	2513	57.8
12–15 years	855	19.7
16+ years	55	1.3
Not recorded	13	0.3
Total	4,345	100.0
Sex		
Male	2,136	49.2
Female	2,207	50.8
Not recorded	2	0.1
Total	4,345	100.0

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

3.3 Type of dental services provided

The health professionals who conducted dental services were required to record the type of services they provided as categorised by the Australian Dental Association Schedule of Dental Services. Table 3.5 shows that aside from diagnostic services, which were provided to almost all children, the most common services provided were preventative (70%) and

restorative (48%). In addition, fluoride varnish and dental surgery were provided to 16% of children. Only 1% of children received a general anaesthetic. Only a small proportion of children received endodontic (2%) and periodontic services (1%). The proportion of children receiving each type of service was very similar whether they had a CHC or not.

Table 3.5: Type of dental services received by Indigenous children^(a), by whether child received CHC, where consent was provided

Dental services ^(b)	CHC		Non-CHC		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Diagnostic	3,118	96.1	1,041	94.6	4,159	95.7
Preventative	2,237	69.0	793	72.0	3,030	69.7
Restorative	1,541	47.5	540	49.0	2,081	47.9
Fluoride	535	16.5	160	14.5	695	16.0
Surgery	521	16.1	171	15.5	692	15.9
<i>General anaesthetic</i>	42	1.3	20	1.8	62	1.4
Endodontic	68	2.1	26	2.4	94	2.2
Periodontic	36	1.1	15	1.4	51	1.2
Other	5	0.2	2	0.2	7	0.2
Total number of children	3,244	100.0	1,101	100.0	4,345	100.0

(a) Data include cases where the HRN is unknown.

(b) This is a multiple response item. If a child was treated for a dental problem at any one of their dental services, they were counted once against that particular problem.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

Figure 3.1 shows the number of children receiving each type of service within each financial year. The number of children receiving diagnostic and preventative services increased from 2008–09 to 2009–10 (see Table 3.1). Restorative services, however, were provided to a similar number of children in each of the last two financial years. Provision of preventative interventions including fluoride varnish was a specific performance indicator for OHS-NT under the NPA from July 2009 and activity was reported separately from that time. Prior to this it was included under preventative services. Dental surgery remained at a similar level between 2008–09 and 2009–10.

3.4 Subsequent dental services

Children who had incomplete treatment or ongoing oral health problems were asked to attend subsequent dental services.

3.4.1 Subsequent dental services received

Information about Indigenous children requiring subsequent dental services is important in examining whether children's treatment plans are completed. Table 3.6 shows that 4,281 children with a valid HRN received a dental service. Of these children, 55% (2,368) were identified by the health professional as requiring further treatment or a follow-up service. After their initial dental service, 37% (1,570) children attended one or more subsequent

services. Among these 1,570 children, 66% still required further follow-up care at 30 June 2010.

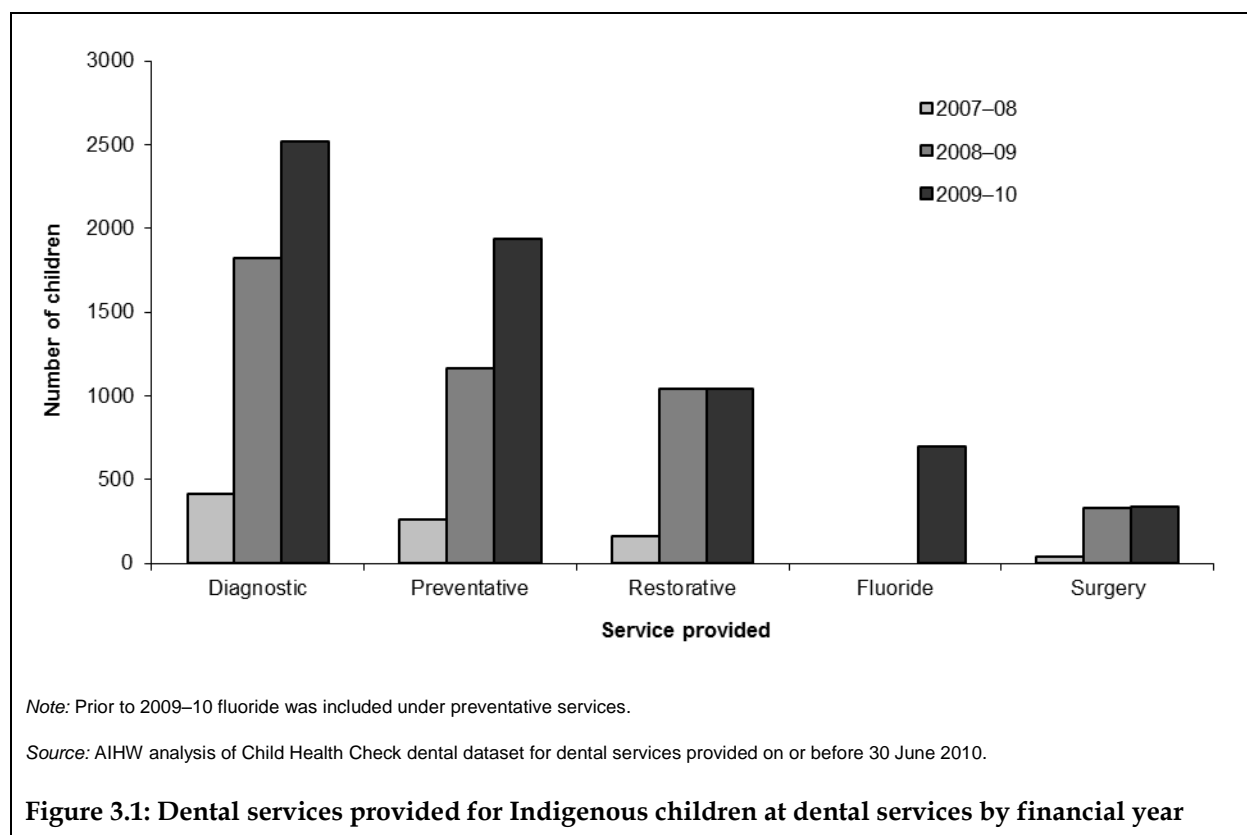


Table 3.6: Indigenous children^(a) requiring subsequent treatment at first dental service and whether they received it, by region, where consent was provided

Region ^(b)	Number of children receiving first dental service	Children requiring subsequent service		Children receiving subsequent service		
		Number	Per cent	Number	Per cent of all dental services	Per cent of those requiring subsequent service
Arnhem	1,167	791	67.8	525	45.0	66.4
Central Australia	1,142	502	44.0	342	29.9	68.1
Darwin Rural	1,068	629	58.9	391	36.6	62.2
Katherine/Barkly	768	401	52.2	281	36.6	70.1
Hospital ^(c)	101	23	22.8	22	21.8	95.7
Out of area ^(d)	35	22	62.9	9	25.7	40.9
Total	4,281	2,368	55.3	1,570	36.7	66.3

(a) Excludes 64 children who had an invalid or missing HRN.

(b) Region based on where child received first dental service.

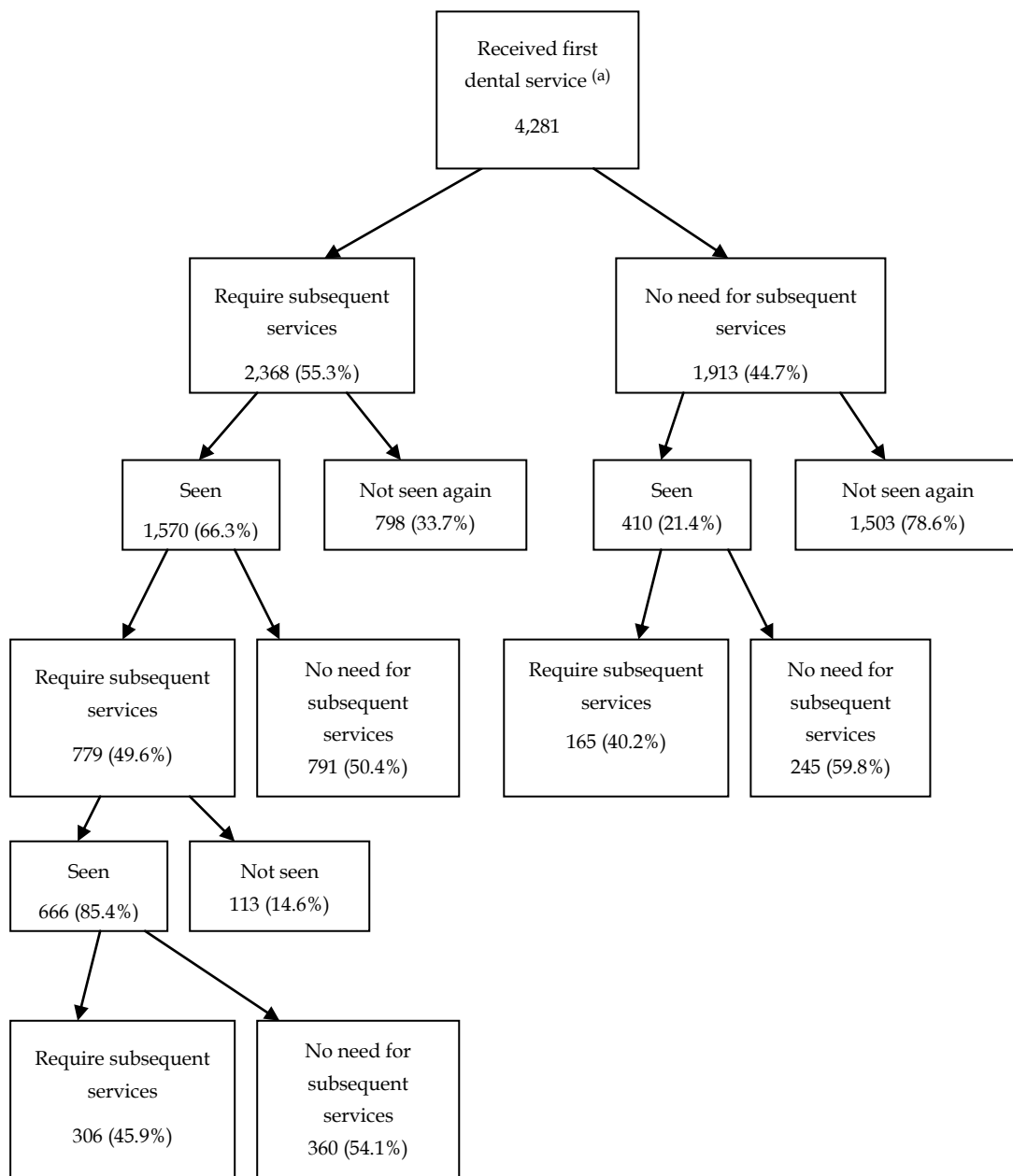
(c) Received first dental service in hospital.

(d) Received first dental service outside of prescribed area.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

There were regional differences in the percentage of Indigenous children requiring dental services subsequent to their first dental service, and those who received these services had them. The proportion of children that required follow-up was highest in Arnhem (68%) followed by Darwin Rural (59%), Katherine/Barkly (52%) and Central Australia (44%). Children who received a subsequent service, as a proportion of those who received a dental service, were also highest in Arnhem (45%) and lowest in Central Australia (30%). Children who received a subsequent service, as a proportion of those requiring a subsequent service, was highest in Central Australia (70%), followed by Katherine/Barkly (68%), Arnhem (66%) and Darwin Rural (62%).

Figure 3.2 shows the care pathway of children who received dental services. About half of the children (779) who received a second dental service required further follow-up and a high proportion of these children (666 or 85%) received a further dental service. There were 1,913 children (45%) who did not require follow-up services at the time of their first dental service however 410 (21%) received further services during subsequent visits by a dental team. Of this group of children 165 (40%) were referred for subsequent care. Of the 3,147 occurrences where a child was asked to revisit clinics for further treatment, 911 (29%) had not been seen as at 30 June 2010. A major reason for children not being seen is the high level of mobility among Indigenous children (see Section 4.3 for more information).



(a) Excludes children with an invalid or missing HRN.

Note: Services where consent provided.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

Figure 3.2: Pathway of care for Indigenous children who received a dental service

4 Dental referrals from CHC and service provision

The health professionals, comprising nurses and medical staff, who conducted the CHCs referred the children for dental services based on an oral health assessment. This chapter examines the extent to which children who received a dental referral from their CHC received a follow-up dental service. This provides insights into whether dental services are being provided to children requiring them. The chapter also describes the challenges faced in providing dental services to children with a CHC dental referral.

A child's CHC referral and dental service data could only be linked if they had a valid HRN. Consent at the time of the dental service was not necessary to link these data because, if consent was not given, a limited data set was provided to enable identification of follow-up to a referral.

4.1 Dental services received by children with a referral

The proportion of Indigenous children with a dental referral from CHC that received a dental service can demonstrate how well services are reaching those in most need. Table 4.1 shows that over 60% of children who had a dental referral from their CHC have since received a dental service. They were 1,269 children with outstanding dental referrals as at 30 June 2010. The highest proportion of children that received a dental service was in Central Australia (71%), while it was lowest in Arnhem (55%). Central Australia had the lowest number of children with outstanding dental referrals (194) and Arnhem had the highest (412), as at 30 June 2010.

Table 4.1: Number of Indigenous children ^(a) with a dental referral, who received dental service, average waiting time and have outstanding dental referral, by region

Region ^(d)	Children with dental referral	Children receiving dental service		Average waiting time between referral and service (months) ^(b)	Outstanding dental referral ^(c)
		Number	Per cent		
Arnhem	918	505	55.0	14.6	412
Central Australia	691	490	70.9	11.8	194
Darwin Rural	902	525	58.2	17.1	376
Katherine/Barkly	713	426	59.7	13.1	287
Total	3,224	1,946	60.4	14.3	1,269

(a) Only includes children those with a valid HRN.

(b) Average waiting time excludes outstanding dental referrals.

(c) The number of children with an outstanding dental referral does not equal the difference between the number of children with a dental referral and receiving a dental service, because some children either passed away or moved outside the prescribed communities.

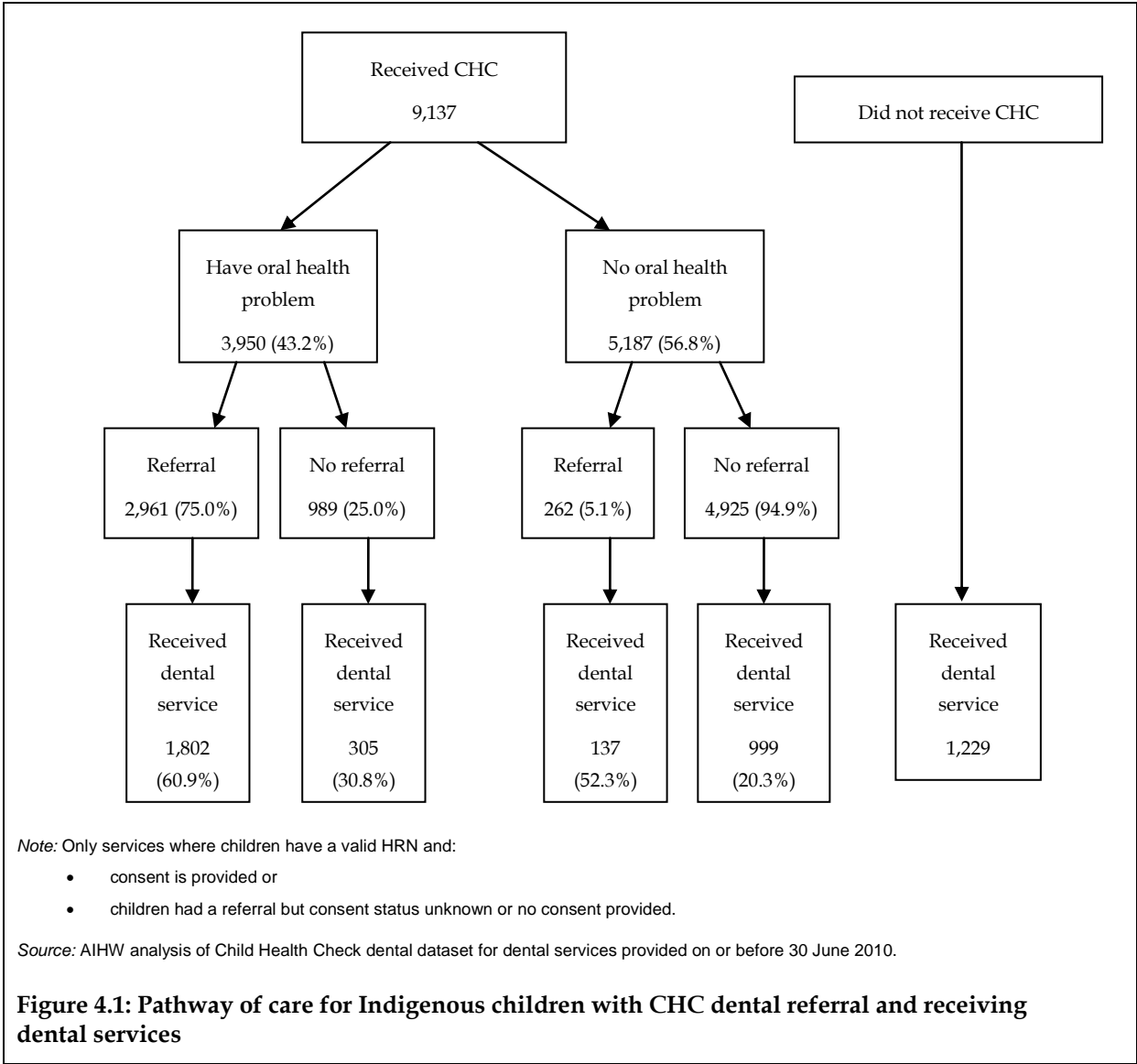
(d) Region where received dental service.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

The average waiting time between referral and service was 14.3 months. The length of time was shortest in Central Australia at 11.8 months, the region that also had the highest percentage of children with a referral who received dental services. The longest average waiting time is in Darwin Rural, at 17.1 months, over 5 months longer than in Central Australia. The average wait time excludes those with an outstanding dental referral.

4.2 Dental care pathway for children

The pathway of care of Indigenous children from receiving a CHC to a dental service is shown in Figure 4.1. Of the 9,137 children who received a CHC with a valid HRN and whose CHC were not recorded using standard forms, 43% (3,950) were identified as having an oral health problem. Oral health problems were the most common health problem identified by the CHCs. Of the children who were diagnosed with an oral health problem at CHC, 2,961 received referrals for follow-up dental services. Of these children, 61% received a follow-up dental service.



A total of 989 children with an oral health problem received no referral, mainly because a referral was in place before they participated in the health check, and 31% did receive a dental service after their health checks. There were 262 referrals for those who were not diagnosed with an oral health problem. Of these 137 or 52% received a follow-up dental service. This is about the same as the proportion that were referred following after diagnosis of an oral health problem at CHC.

A dental service was received by 20% of children who received no referral at their CHC and were not identified as having an oral health problem. A total of 1,229 children who had not had a CHC also received a dental service. These children presented for a dental service when the dental team visited their community.

These data do not include those who did not consent to sharing information with AIHW, and so their CHC and follow-up dental service information could not be linked.

4.3 Challenges to follow-up dental care

The provision of follow-up dental treatment has long been identified as a major problem in the provision of dental care in the Indigenous population (Slater 2001). This problem also presents a number of challenges to the provision of dental care to children who received a dental referral at their health check.

Despite efforts over the last 3 years to provide follow-up care to these children, 1,269 children with a dental referral had not received dental services at the end of June 2010.

As shown in Table 4.2, there were 94 communities where children received a dental referral at their health check. The majority of them (87 communities) had access to the dental services. Children in these communities could access dental services either from the dental outreach teams, or from the existing dental services. Only 7 communities did not have access to dental services. About 97% of children with an outstanding referral lived in a community where they could access dental services.

One significant challenge for providing follow-up care in these communities where children can access dental services is the high mobility of the Indigenous population in these areas.

Based on the CHCI dental data, the children's community of residence at their CHC was compared to their community of residence where they received their dental services. Constrained by the available information, the data on the community of residence are only available for 1,774 children who received the dental service in 2009-10 and who gave consent for sharing information.

The results of this comparison shown in Table 4.3 indicate high mobility among these children. Of 1,774 children examined, 1,089 (61%) lived in the same community when receiving both CHC and dental services. A total of 382 (22%) children lived in a different community but in the same region at their dental service and CHC. A further 303 (17%) children moved regions.

Table 4.2: Availability of dental service and outstanding dental referral^(a) at 30 June 2010

Community type	Number of communities	Children with dental referral	Outstanding dental referral ^(b)		
			Number	Per cent of dental referrals within community type	Per cent of all outstanding referrals
Community where dental service was provided:					
Visited by outreach teams	62	2,858	1,135	39.9	89.4
Not visited by outreach teams, but have existing fixed dental clinics ^(c)	2	30	17	56.7	1.3
Not visited by outreach teams, but have existing mobile dental clinics ^(d)	5	105	57	54.3	4.5
Not visited by outreach teams, but dental services provided ^(e) by dental clinic in the community nearby	18	132	26	19.7	2.0
<i>Subtotal</i>	<i>87</i>	<i>3,125</i>	<i>1,235</i>	<i>39.7</i>	<i>97.3%</i>
<i>Community where dental service was not provided</i>	<i>7</i>	<i>99</i>	<i>34</i>	<i>34.3</i>	<i>2.7%</i>
Total	94	3,224	1,269	n.a.	100

n.a. not applicable

(a) Only includes children those with a valid HRN.

(b) Those children who only receive a dental service before CHC are counted as outstanding.

(c) Existing fixed clinic provided by NT DoH.

(d) Existing mobile service provided by NT DoH.

(e) A child who resides in a community near where a fixed clinic exists.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

Table 4.3: Number of Indigenous children^(a) that moved community of residence between CHC and follow-up dental service^(b), where consent was provided and dental service provided in 2009-10

Location	Number	%
Children who resided in the same community at time of CHC and time of follow-up dental service	1,089	61.4
Children who did not reside in the same community at time of CHC and time of follow-up dental service		
In different community but in same region	382	21.5
In different region	303	17.1
<i>Subtotal of children who resided in different community at time of CHC and time of follow-up dental service</i>	<i>685</i>	<i>38.6</i>
Children who received both CHC and follow-up dental service	1,774	100.0

(a) Children with valid HRN.

(b) Where child's place of residence at time of dental service known.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

A further challenge to reaching children was that most dental outreach teams access children through local schools, making it very difficult to find children who were over the age of 12

years and those who do not attend school regularly. Schools in most of the prescribed areas are categorised as 'very remote' by the NT Department of Education. The attendance level for Indigenous children in very remote schools was 63.0% and 57.8% in 2009 and 2010 respectively (Northern Territory Department of Education 2010). The low attendance rates reduce the opportunity for dental teams to access children requiring initial and follow-up care.

There is an additional challenge to the data collection among the communities that were not visited by dental outreach teams, but have existing dental services. 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. Table 4.2 shows that for children living in communities that have an existing fixed or mobile clinic, but were not visited by outreach teams, more than half of referrals were outstanding. This contrasts with 40% in communities visited by outreach teams.

For communities located in very remote areas, the dental outreach teams were also not able to visit them physically. The children in these communities need to be transported to the major town centres or town camps where either have existing dental clinics or are more likely to be visited by outreach teams. Among these communities, about 20% referrals are still outstanding (Table 4.2).

It is important to note that dental services are voluntary and some children or their parent/guardians may have declined the offer of a service.

5 Oral health status of children receiving dental services

Oral health is a significant health issue worldwide, comprising oral diseases such as dental caries, periodontal disease, and tooth loss, among other conditions (Petersen et al. 2005). This chapter describes the oral health of children receiving dental services, including the type of dental problems treated, DMFT/dmft results, and a discussion on the association between the oral health and growth problems of children. A comparison of oral health outcomes with previous findings for Indigenous children is also provided. But these data should be interpreted as the result of health professionals' clinical assessments of the children, who identify and treat children for clinically significant problems.

5.1 Dental problems treated

Table 5.1 and Figure 5.1 show that a large component of the services provided was oral health education (60%). Treatment for previously untreated caries was provided to 52% of children who had a dental service, while 26% were given a dental hygiene treatment, including plaque removal and calcification. The proportion of children that received treatment for problems, such as mouth infection or sores (8% of children that had a dental service), gum disease (3%), broken or chipped teeth due to trauma (1%), abnormal teeth growth (1%) and missing teeth (<1%), was much lower. Other problems, including dental abscess, were treated by health professionals for over one-quarter (27%) of children. There was little difference in the types of problems treated for children by whether they had also received a CHC or not. The largest difference was for oral health education, which was more common for children without a CHC (66%) compared with those with a CHC (58%).

5.2 DMFT/dmft results

The DMFT/dmft is a widely used indicator of oral health status. It measures the number of decayed, missing and filled teeth of a person. 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. Exfoliate deciduous teeth (where normal tooth loss has occurred) are not included as missing teeth.

It is important to note that the DMFT/dmft data in this report are only available for a 9-month period, from March to December 2009, due to NT DoH data extraction problems (see Chapter 1). DMFT/dmft data from ACCHOs are available for the same period. DMFT/dmft data were available for 1,939 children, comprising 32% of all children that received dental services.

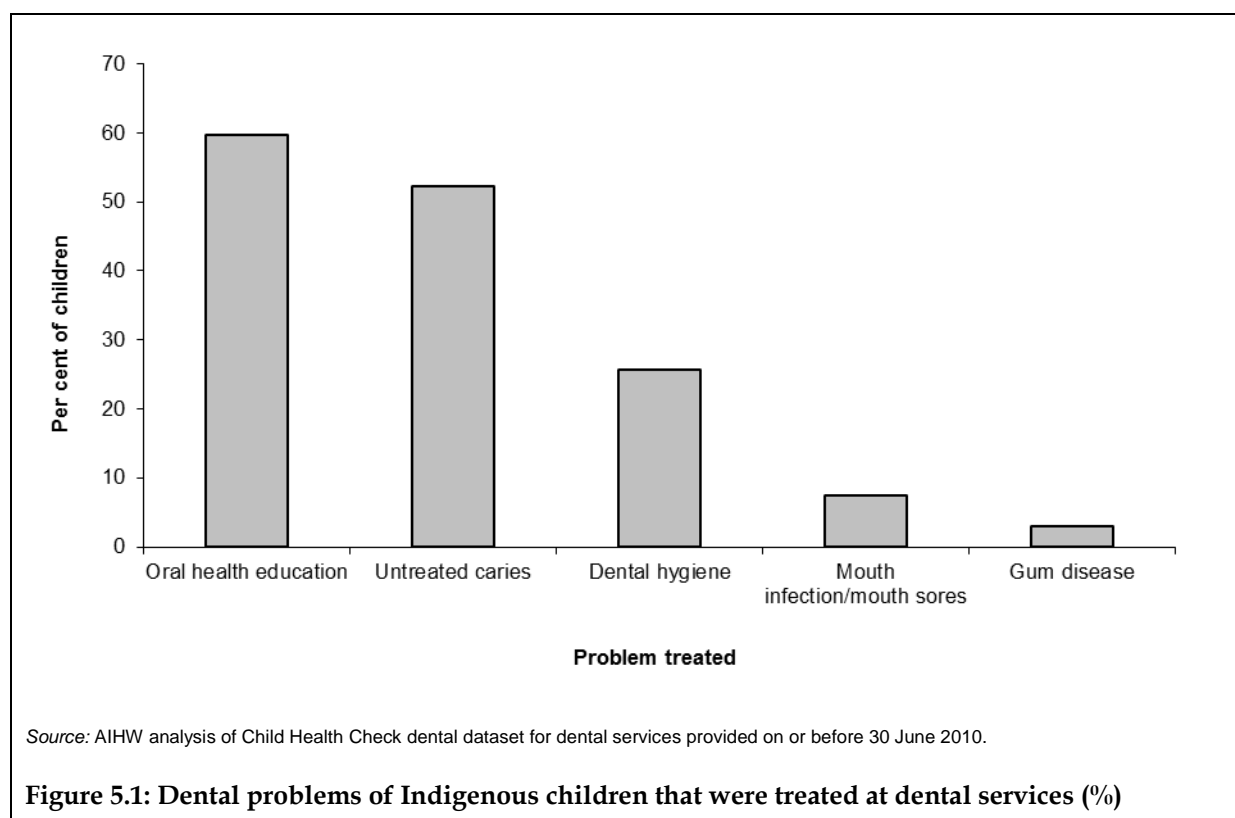
Also, the DMFT/dmft data were not assigned according to the base chart for some children. This affected the accuracy of the decayed, missing and filled teeth components of the DMFT/dmft score at initial presentation. The accuracy of the total DMFT/dmft score, however, was not affected. Therefore, only the total DMFT/dmft score is presented in this report.

Table 5.1: Dental problems of Indigenous children that were treated, whether child received CHC, where consent provided

Problems treated ^(a)	CHC		Non-CHC		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Oral health education	1,865	57.5	728	66.1	2,593	59.7
Untreated caries	1,690	52.1	581	52.8	2,271	52.3
Dental hygiene (including plaque/ calcification)	808	24.9	302	27.4	1,110	25.5
Mouth infection or mouth sores	247	7.6	80	7.3	327	7.5
Gum disease	88	2.7	38	3.4	126	2.9
Broken/chipped teeth from trauma	45	1.4	11	1.0	53	1.2
Abnormal teeth growth	42	1.3	14	1.3	59	1.4
Missing teeth	6	0.2	9	0.8	15	0.3
Other (including dental abscess)	873	26.9	278	25.2	1,151	26.5
Total number of children	3,244	100.0	1,101	100.0	4,345	100.0

(a) This is a multiple response item. If a child was treated for a dental problem at any one of their dental services, they were counted once against that particular problem.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.



Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

Figure 5.1: Dental problems of Indigenous children that were treated at dental services (%)

5.2.1 DMFT/dmft by age

Table 5.2 shows the decayed, missing and filled teeth components of the total DMFT/dmft score. The mean total DMFT/dmft score was 5.0 among Indigenous children in prescribed areas of the Northern Territory. The mean total DMFT/dmft is highest in children aged 4–8 years, at around 6.0. It was the lowest at ages 11 years (2.8), and increased again to reach 4.6 at ages 15–17 years.

Table 5.2: Number of decayed, missing and filled teeth, and mean number of deciduous dmft, permanent DMFT and total DMFT/dmft, children aged 0–17 years

Age group	Number of Children	Mean of total DMFT/dmft	DMFT/dmft >0	Per cent of children with DMFT/dmft >0
0–3 years	109	4.5	78	71.6
4	132	5.8	104	78.8
5	179	6.0	158	88.3
6	226	6.2	200	88.5
7	220	5.8	202	91.8
8	207	6.1	192	92.8
9	181	4.8	156	86.2
10	157	4.1	128	81.5
11	153	2.8	106	69.3
12	118	3.8	95	80.5
13	107	4.0	75	70.1
14	77	4.3	63	81.8
15–17	73	4.6	55	75.3
Total	1,939	5.0	1,612	83.1

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

5.2.2 DMFT/dmft by region

The regional breakdown of DMFT/dmft is shown in Table 5.3 for children aged 0–17 years according to the region where the children received the services. Hospitals are also included in this table because some children received dental surgery in the hospitals rather than in their region's dental clinics. The proportion of children with a DMFT/dmft score of above zero ranged from 73% in Central Australia to 91% in Arnhem. The mean DMFT/dmft in regions was also lowest in Central Australia and clearly highest in Arnhem (6.5), excluding hospitals. The excessively high DMFT/dmft scores in Arnhem were not replicated in the East Arnhem region in the 2002 Child Dental Survey in the Northern Territory that showed much smaller regional differences (AIHW 2007a). The highest mean DMFT/dmft was 9.2 in hospitals, where children would have the most severe oral health problems.

Table 5.3: Percentage of children with DMFT/dmft>0 and mean DMFT/dmft by region, children aged 0-17 years

Region ^(a)	Children	DMFT/dmft>0	Mean DMFT/dmft
Arnhem	573	91.3	6.5
Central Australia	474	73.2	3.8
Darwin Rural	409	83.1	4.4
Katherine/Barkly	387	80.1	3.9
Hospital ^(b)	96	95.8	9.2
Total	1,939	83.1	5.0

(a) Region where received dental service.

(b) Received dental service in hospital.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

5.2.3 Northern Territory, national and international comparisons

The DMFT/dmft scores from dental service data are compared with Child Dental Health Survey data for the NT and Australia. These data sources have different methods of selecting children for DMFT/dmft testing, which should be considered when comparing DMFT/dmft scores. The Child Dental Health Survey results are based on a representative sample of children enrolled in school dental services (Armfield et al. 2009). These services are provided to over 80% of primary school children in some jurisdictions. In contrast, the DMFT/dmft testing in the dental service data was for all children that received a service from March to December 2009, irrespective of whether they received a CHC referral or had an oral health problem (see Figure 4.1).

DMFT/dmft data are available from other sources but only for certain age groups. These age groups are used when comparisons are made with CHCI DMFT/dmft data.

Table 5.4 shows the dmft results for deciduous teeth. The mean dmft for children aged 0-4 years was 5.2, with three-quarters of children having a dmft score greater than zero. Amongst children aged 5-12 years, the mean dmft was 4.5 which is about two-and-a-half times that in Australia and the Northern Territory for the same age group. The proportion of children with a dmft score greater than zero was 83%, again substantially higher than in Australia or the Northern Territory.

Table 5.5 shows that the mean DMFT of permanent teeth was 2.1 for children aged 5-12 years and 4.3 for those 13-17 years. The percentage of children with a DMFT score greater than zero was 60% for 5-12 year olds and 76% for 13-17 year olds. The dental service data figures for children aged 5-12 years are very high compared with Australia (mean DMFT 0.5, 25% with DMFT score greater than zero) and Northern Territory (mean DMFT 0.4, 21% with DMFT score greater than zero) in the Child Dental Survey.

Table 5.4: Percentage of children with dmft score above 0 and mean dmft, Child Health Check dental data and Child Dental Health Survey 2003–04, deciduous teeth, by age group

Age group	Child Health Check dental data			Child Dental Health Survey—NT		Child Dental Health Survey—Australia ^(a)	
	Children	dmft>0	Mean dmft	dmft>0	Mean dmft	dmft>0	Mean dmft
0–4 years	238	76.5	5.2	n.a.	n.a.	n.a.	n.a.
5–12 years	1,159	82.7	4.5	48.1	1.8	45.7	1.7

(a) Excluding New South Wales.

Note: Number of children is those checked for deciduous teeth.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010, Armfield and others (2009:33-35).

Table 5.5: Percentage of children with DMFT score above 0 and mean DMFT, Child Health Check dental data and Child Dental Health Survey 2003–04, permanent teeth, by age group

Age group	Child Health Check dental data			Child Dental Health Survey—NT		Child Dental Health Survey—Australia ^(a)	
	Children	dmft>0	Mean dmft	dmft>0	Mean dmft	dmft>0	Mean dmft
5–12 years	1,039	60.3	2.1	20.8	0.4	25.4	0.5
13–17 years	255	75.7	4.3	n.a.	n.a.	n.a.	n.a.

(a) Excluding New South Wales

Note: Number of children is those checked for permanent teeth.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010, Armfield and others (2009:33-35).

Figure 5.2 reveals that the mean DMFT of 12-year-old children in the dental service data (3.8) was high compared with other countries. Of the countries presented, the DMFT scores are 0.8 in the Netherlands, 1.0 in Australia and Germany, 1.7 in Japan and 2.8 in Brazil. This shows that the oral health of Indigenous children in this dataset is poor by global standards.

5.3 Oral health and growth problems

Previous studies have found that oral health problems increased the risk of malnutrition among children, especially among the youngest (Floyd 2009, Psoter et al. 2005). In this report we examined data of the relationship between oral health problems and growth problems of Indigenous children identified at the CHC. However, the data show very little difference in the presence of growth problems in children according to whether they have an oral health problem (Table 5.6). No growth problem was found in 80% of children with any oral health problem, and 83% of children with no oral health problem. The proportion of children with each type of growth problem was also very similar according to the presence of an oral health problem. The most common growth problem was wasting (14% for children with oral health problem, 10% for no oral health problem). The type of oral health problem also did not have any association with having a growth problem, with no growth problem being present in 80% of children with untreated caries and 77% with dental hygiene problems.

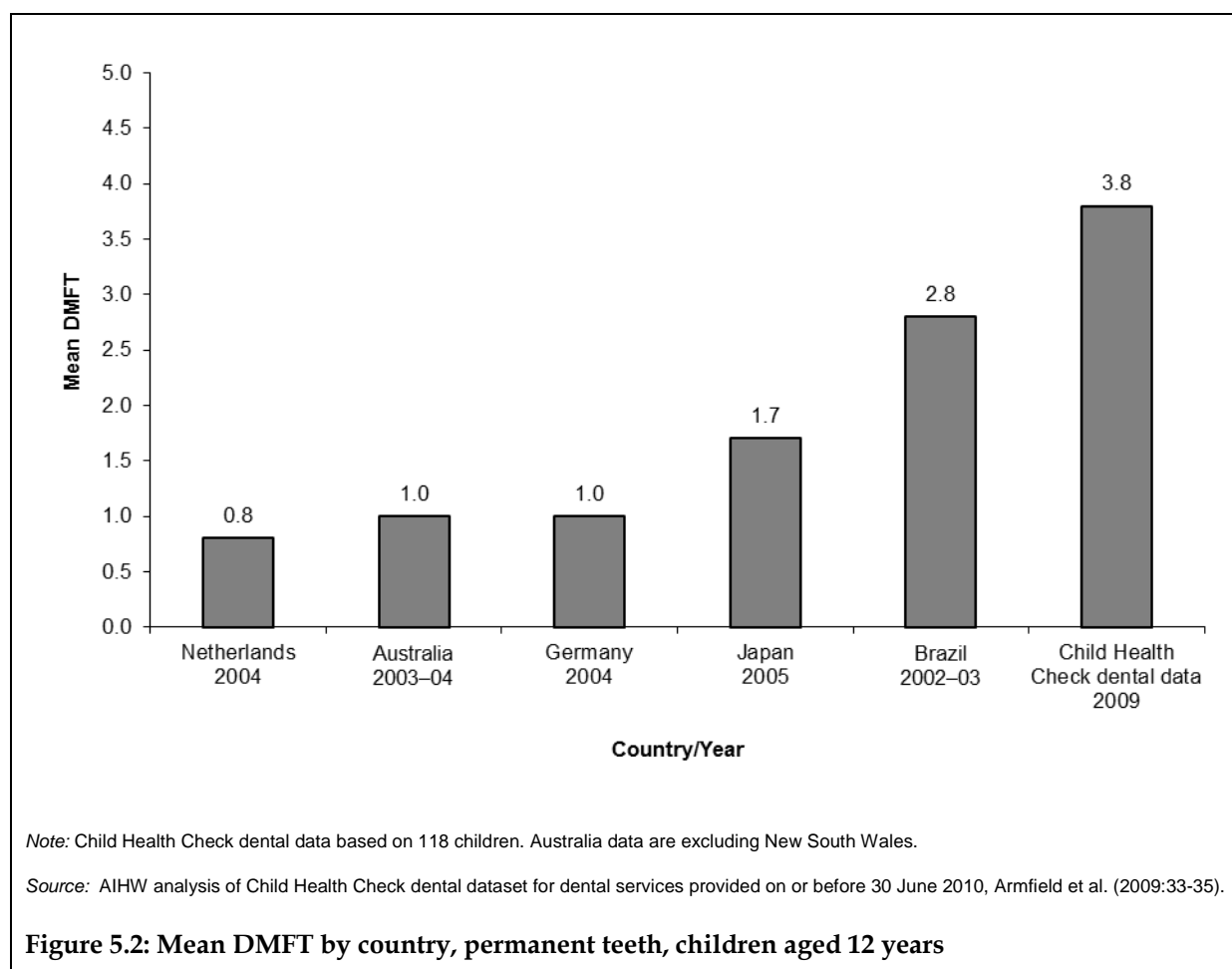


Table 5.6: Number of Indigenous children with stunting, underweight and wasting at CHC by oral health problems at CHC

Oral health problem treated	Stunting		Underweight		Wasting		No growth problem		Number of children
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	
Any oral health problem^(a)	154	4.0	379	9.9	529	13.8	3,061	80.0	3,825
Untreated caries	146	4.1	359	10.1	497	14.0	2,845	79.9	3,562
Dental hygiene	16	3.5	49	10.6	78	16.8	358	77.3	463
No oral health problem	219	4.4	468	9.4	476	9.6	4,148	83.2	4,984
Total number of children in CHC	373	4.2	847	9.6	1,005	11.4	7,209	81.8	8,809

(a) This is a multiple response item. If a child was treated for a dental problem at any one of their dental services, they were counted once against that particular problem.

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010.

There is however a relationship between DMFT/dmft scores and identification of a growth problem at CHC. The presence of a growth problem was slightly higher in Indigenous children with a deciduous dmft score of greater than zero (16%) compared with a dmft score equal to zero (13%) (Table 5.7). For permanent teeth, where the child had a DMFT score greater than zero (17%) growth problems were also slightly higher than if the DMFT score was zero (13%). There is a time lag between the DMFT/dmft score being measured and the CHC, however given dental problems normally develop over a long period of time, this is unlikely to have much effect on the relationship.

Table 5.7: Number of Indigenous children with any growth problem at CHC by DMFT/dmft at their dental service

Growth problem	Deciduous dmft > 0		Deciduous dmft = 0		Permanent DMFT > 0		Permanent DMFT = 0	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Yes	133	15.8	24	12.8	96	16.9	46	12.8
No	707	84.2	164	87.2	471	83.1	312	87.2
Total	840	100.0	188	100.0	567	100.0	358	100.0

Source: AIHW analysis of Child Health Check dental dataset for dental services provided on or before 30 June 2010. AIHW analysis of Child Health Check dataset for health checks provided on or before 30 June 2009.

5.4 Oral health of Indigenous children

The DMFT/dmft findings reveal poor oral health amongst Indigenous children receiving dental services as part of the CHCI. The higher DMFT/dmft scores of Indigenous children compared with all Australian and Northern Territory children were confirmed by research from the Child Dental Health Surveys. Australia-wide, the mean dmft for Indigenous children at ages 4–10 years, and DMFT at ages 6–15 years, is higher than for non-Indigenous children (AIHW 2007b). Furthermore, the mean number of decayed permanent and deciduous teeth in the Child Dental Health Survey is about three times higher for Indigenous compared with non-Indigenous children, suggesting lower levels of treatment for Indigenous children (AIHW 2007b). Among Indigenous children, mean DMFT/dmft was higher in rural than urban areas. Of concern is that caries prevalence in Indigenous children is increasing, especially for deciduous teeth, while for non-Indigenous children it has remained stable (AIHW 2007b).

Similar differences in DMFT/dmft scores by children's Indigenous status are present in the Northern Territory (AIHW 2007a). Exacerbating these problems, the measures of poor oral health in Indigenous children in the NT are rising more quickly than for non-Indigenous children (AIHW 2007b). Such differences in oral health by Indigenous status are confirmed by data from other sources across Australia, including school dental data and screening service data (Brennan et al. 2007, Davies et al. 1997, Jamieson et al. 2007a, Jamieson et al. 2007b, Jamieson et al. 2007c, Parker and Jamieson 2010). Remote Indigenous children also have the highest rates of hospitalisation for dental caries, where care comprised receipt of restorations and extractions (Jamieson & Roberts-Thomson 2006).

The findings from CHCI data in this report show that children have received treatment for dental hygiene and mouth infections and sores. A cohort study of 16–20 year olds showed that Indigenous adolescents and young adults had 10.8 times the prevalence of

moderate/severe periodontal disease, and 1.9, 4.1 and 4.5 times the prevalence of calculus (hardened dental plaque), plaque and gingivitis respectively (Jamieson et al. 2010b).

The association between children's deciduous dmft and growth problems, although small, is consistent with findings from a literature review conducted by Psoter et al. (2005) that malnutrition in children is related with caries in deciduous teeth. Floyd (2009) supported these findings. The review by Psoter et al. (2005) however found that evidence for the association between dental caries in permanent teeth and growth problems is less established.

One reason for poor oral health outcomes for Indigenous children may be a poor diet which in turn is influenced by adverse social and economic conditions in which the children live. High sugar intake increases the risk of dental caries, especially for an undernourished person (Moynihan et al. 2004). In remote communities, fresh fruit can be difficult to access and there has been an increase in the availability of food and drink with high sugar content. As a result, there is now high consumption of items with high sugar content, together with low intake of fresh fruit (Jamieson et al. 2006b). This creates a vicious cycle; poor oral health can also have a major impact on the ability to eat a varied diet, in particular fruits and vegetables (Moynihan & Petersen 2004).

A second factor influencing oral health outcomes is low exposure to fluoride. This is due to low levels of brushing teeth at school or home in remote communities with fluoride toothpaste (AIHW 2007b, Jamieson et al. 2010a). Also, lack of access to a fluoridated water supply can increase the risk of dental caries, as found in Indigenous communities, except in Central Australia where ground waters have natural levels of fluoride at, or higher than, the recommended levels (Moynihan et al. 2004, Schamschula et al. 1981).

The poor oral health status of many Indigenous children has a detrimental impact on their health and wellbeing. It can impact on social interaction through its impact on speaking and general communication (Petersen et al. 2005). Furthermore, the same study found that poor oral health has also been associated with chronic diseases such as diabetes and stroke (Petersen et al. 2005).

Many of the factors causing oral health problems are commonly due to the poor socioeconomic status of the Indigenous population. However, it has been shown that in most age groups the least disadvantaged Indigenous children generally had worse oral health than the most disadvantaged non-Indigenous children (Jamieson et al. 2006a).

Appendix 1

ENTER CHCI DENTAL SERVICES DATA COLLECTION FORM

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

(continued on next page)

Please provide HRN and date of service again: 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

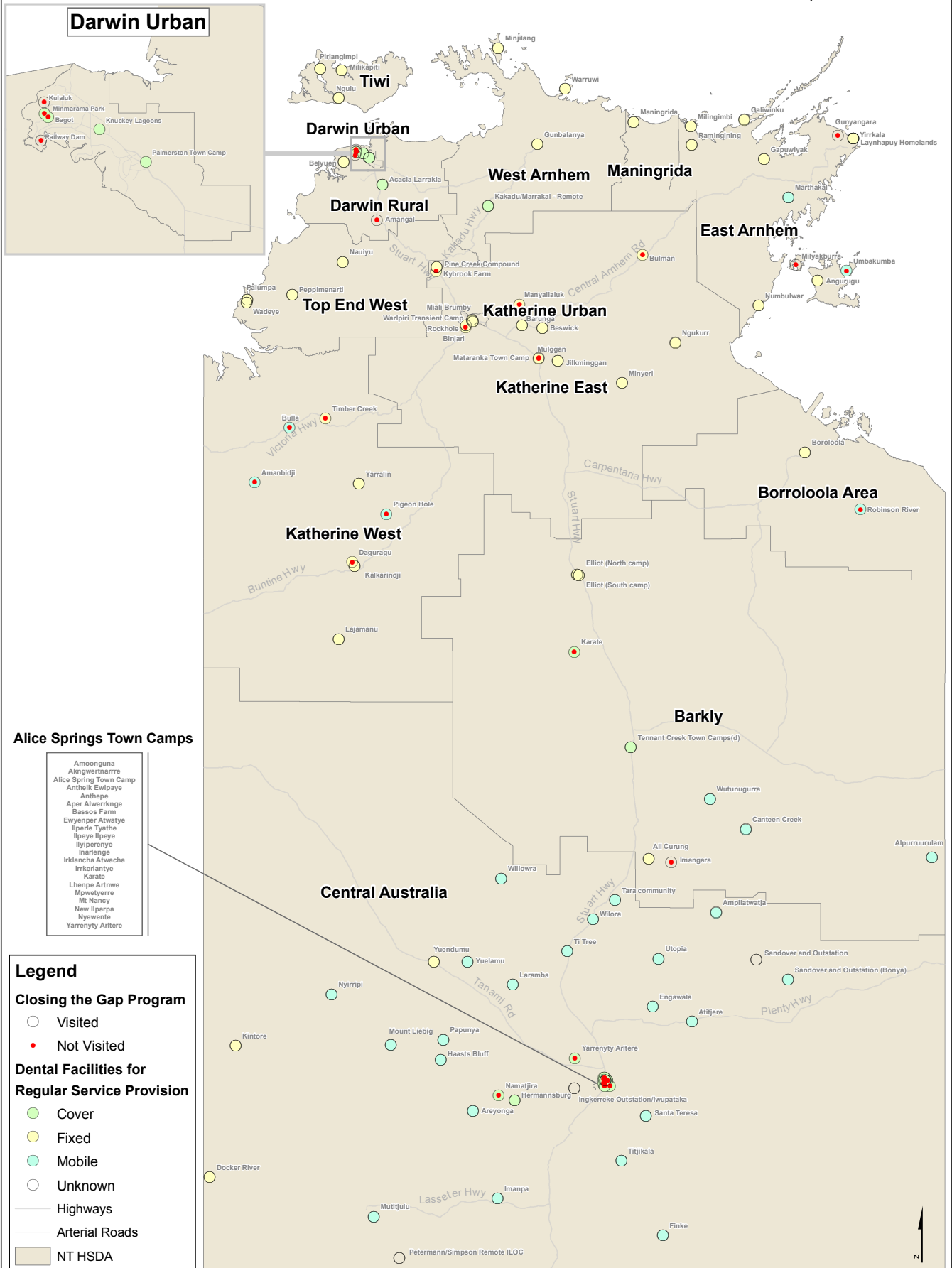
Yes No

Appendix 2

Map of communities covered in the CHCI dental program

Closing the Gap - Dental

Child Health Check Initiative Follow-up Data



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