

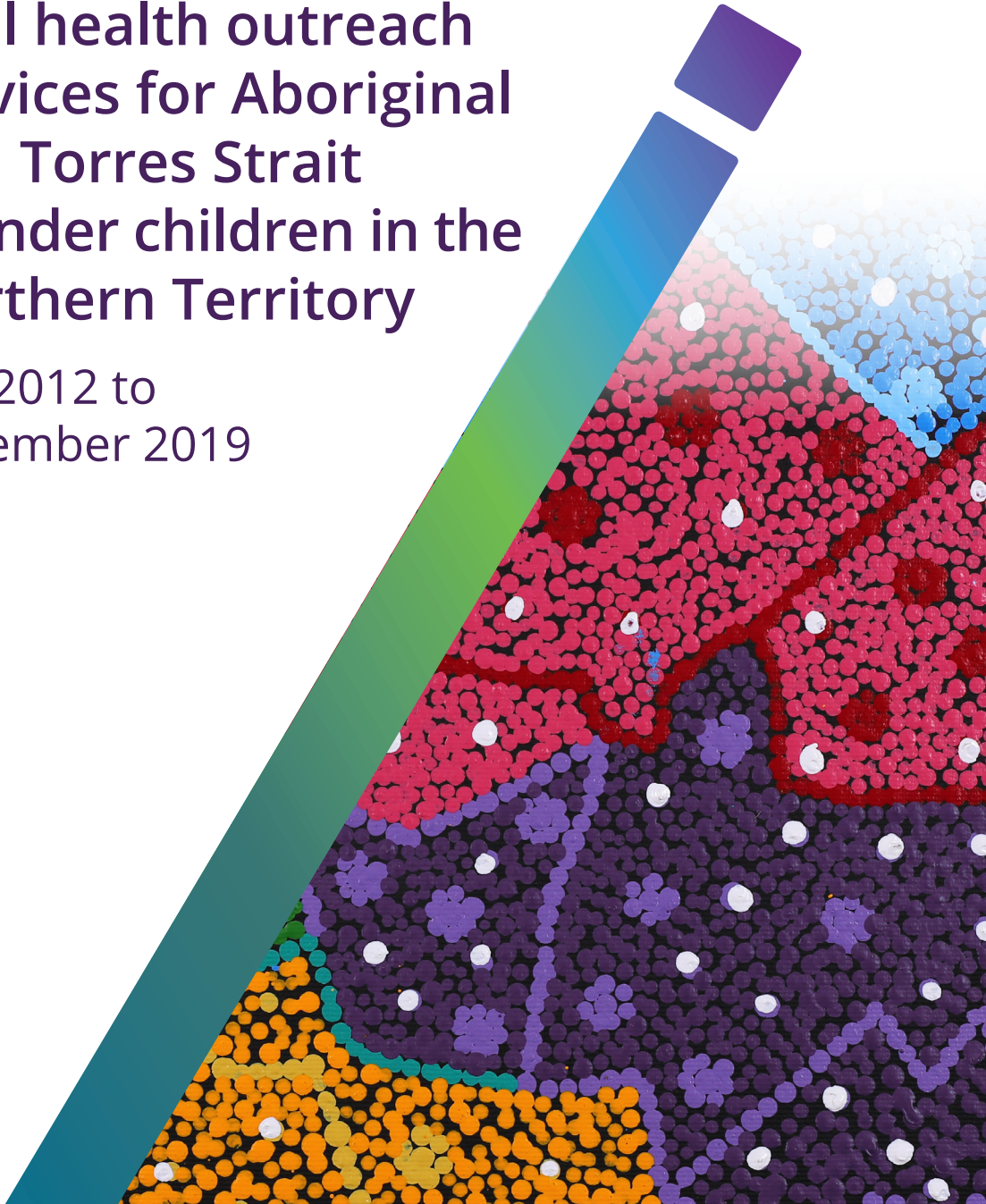


Australian Government
**Australian Institute of
Health and Welfare**



Oral health outreach services for Aboriginal and Torres Strait Islander children in the Northern Territory

July 2012 to
December 2019



**Oral health outreach
services for Aboriginal
and Torres Strait
Islander children in the
Northern Territory**

July 2012 to
December 2019



The Australian Institute of Health and Welfare is a major national agency whose purpose is to create authoritative and accessible information and statistics that inform decisions and improve the health and welfare of all Australians.

© Australian Institute of Health and Welfare 2021 

This product, excluding the AIHW logo, Commonwealth Coat of Arms and any material owned by a third party or protected by a trademark, has been released under a Creative Commons BY 3.0 (CC-BY 3.0) licence. Excluded material owned by third parties may include, for example, design and layout, images obtained under licence from third parties and signatures. We have made all reasonable efforts to identify and label material owned by third parties.

You may distribute, remix and build upon this work. However, you must attribute the AIHW as the copyright holder of the work in compliance with our attribution policy available at www.aihw.gov.au/copyright/. The full terms and conditions of this licence are available at <http://creativecommons.org/licenses/by/3.0/au/>.

A complete list of the Institute's publications is available from the Institute's website www.aihw.gov.au.

ISBN 978-1-76054-818-6 (Online)

ISBN 978-1-76054-817-9 (Print)

Suggested citation

Australian Institute of Health and Welfare 2021. Oral health outreach services for Aboriginal and Torres Strait Islander children in the Northern Territory July 2012 to December 2019. Cat. no. IHW 235. Canberra: AIHW.

Australian Institute of Health and Welfare

Board Chair

Mrs Louise Markus

Chief Executive Officer

Mr Barry Sandison

Any enquiries relating to copyright or comments on this publication should be directed to:

Australian Institute of Health and Welfare

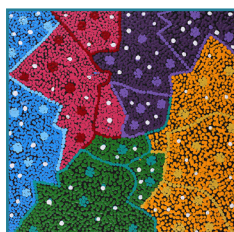
GPO Box 570

Canberra ACT 2601

Tel: (02) 6244 1000

Email: info@aihw.gov.au

Published by the Australian Institute of Health and Welfare.



Cover art

Ngapa Jukurrpa—Water Dreaming—Puyurru by Nikkita Nangala Sampson
© Warlukurlangu Artists Aboriginal Corporation

Please note that there is the potential for minor revisions of data in this report.
Please check the online version at www.aihw.gov.au for any amendments.

Contents

Summary	v
1 Introduction	1
Oral health in the Northern Territory	2
Australian Government oral health programs in the Northern Territory	3
About this report	3
2 Dental service delivery	5
What services are provided?	7
Consent rates	7
How many children had full-mouth fluoride varnish and fissure sealant services? ..	8
Full-mouth fluoride varnish	8
Fissure sealants	10
How many children had clinical service visits?	12
Services provided	14
How were services delivered?	14
3 Oral health status	16
How many children had decayed, missing and filled teeth?	17
Children in the NTRAI OHP compared with other Australian children	20
Significant Caries Index	21
How has tooth decay experience changed over time?	22
Changes over time and differences across CHCI (CtG) and NTRAI OHP	23
4 Progress against benchmarks	25
Service delivery targets	26
Health outcome targets	27

Appendix A: About the Northern Territory Remote Aboriginal Investment Oral Health Program data collection	28
Data collection, management and reporting	28
History of the program	29
Appendix B: Data quality statement	30
SFNT/NTRAI OHP dental data collection summary	30
Acknowledgments	31
Abbreviations	31
Glossary	32
References	34
List of tables	36
List of figures	36
Related publications	37

Summary

Oral health is an important part of overall health and quality of life. Poor oral health can affect adults and children alike, causing pain, embarrassment, even social marginalisation. For children, the effects can be long term, and carry through to adulthood.

Aboriginal and Torres Strait Islander children are more likely than non-Indigenous children to experience tooth decay. Several factors contribute to the poorer oral health of Indigenous children, including social disadvantage and lack of access to appropriate diet and dental services.

Since 2007, the Australian Government has helped fund oral health services for Indigenous children aged under 16 in the Northern Territory. The Northern Territory Remote Aboriginal Investment Oral Health Program (NTRAI OHP) complements the Northern Territory Government Child Oral Health Program by providing preventive (application of full-mouth fluoride varnish and fissure sealants) and clinical (tooth extractions, diagnostics, restorations and examinations) services.

This report mainly presents data from the NTRAI OHP from July 2012 to December 2019, but includes some longer term analyses for 2009 to 2019.

How many Indigenous children received services in the NTRAI OHP?

In 2019, more than 13,000 services were delivered to Indigenous children in the Northern Territory under the NTRAI OHP. Of those children:

- 5,614 received around 6,807 full-mouth fluoride varnish services, a rise of 378 services from 2018
- 1,612 received fissure sealant applications to almost 6,266 teeth, a decrease of 661 teeth from 2018
- 3,552 received clinical services during 4,780 visits—such as dental assessments, fillings, extractions, or preventive services—a rise of 894 visits from 2018.

In 2019:



5,614 children received fluoride varnish services



1,612 children received fissure sealant applications



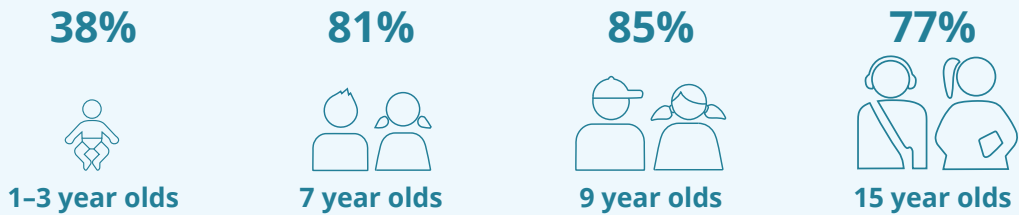
3,552 children received clinical service visits

Sources: tables S2.1, S2.3, S2.6.

How many Indigenous children experienced tooth decay in the NTRAI OHP?

Tooth decay varied by age, and in 2019, children aged 9 had the highest percentage of tooth decay experience (85%). In comparison, 4 in 10 (38%) children aged 1–3 experienced tooth decay in 2019.

Proportion of children in the NTRAI OHP who experienced tooth decay varied by age in 2019:



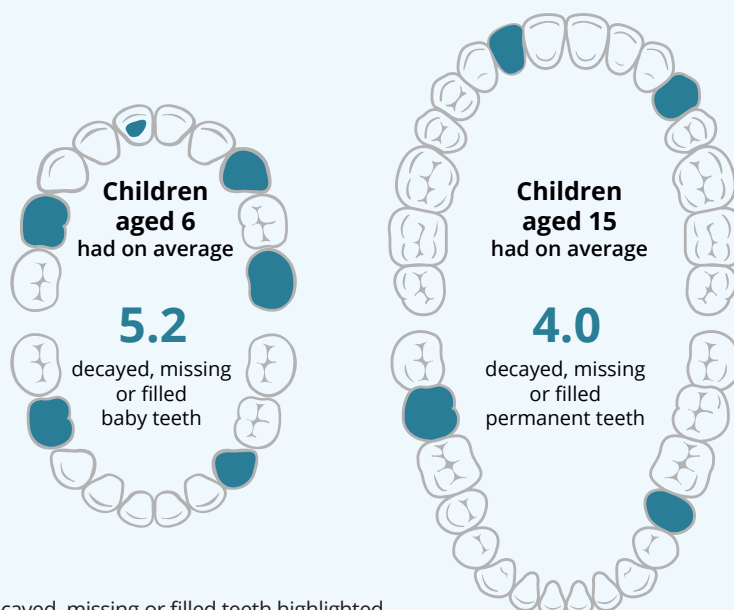
Source: Table S3.1.

How many decayed, missing or filled teeth did Indigenous children have?

A widely used indicator to measure oral health status is a count of the number of decayed, missing or filled teeth.

On average, in 2019, children in the NTRAI OHP aged 6 had the highest average number of decayed, missing or filled baby teeth (dmft), at 5.2 teeth, while children aged 15 had the highest average number of decayed, missing or filled permanent teeth (DMFT), at 4.0 teeth.

Among Indigenous children in the NTRAI OHP in 2019:



Source: Table S3.1.

Note: The number of decayed, missing or filled teeth highlighted has been rounded to the nearest whole number.

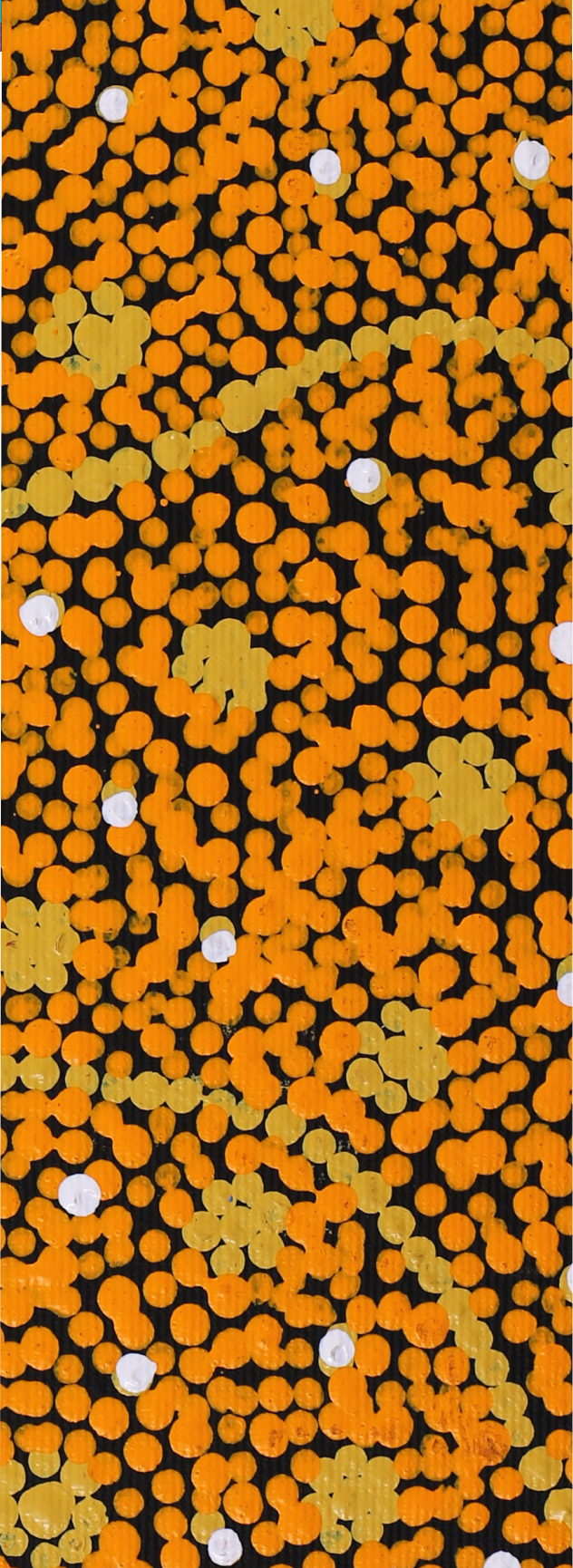
Is the program meeting its benchmarks?

The NTRAI OHP has performance indicators and benchmarks to monitor its outcomes. In 2019, the service delivery targets for clinical service visits and fissure sealant applications were met or exceeded. The target for fluoride varnish applications was not met (Table S1).

Table S1: Progress against benchmarks, 2019

Service delivery targets	Outcomes
At least 3,800 occasions of clinical service visits per year	4,780 clinical service visits
At least 6,908 fluoride varnish applications in 2019	6,807 fluoride varnish applications provided
Fissure sealant applications to at least 3,500 teeth in 2019	Fissure sealant applications to 6,266 teeth
Health outcome targets	
At least 50% of total service items are preventive services	67% of total service items were preventive in 2019





1

Introduction

Oral health plays a vital role in overall health, and can affect quality of life. Good oral health allows people to socialise and speak without pain, disease, discomfort or embarrassment. It can prevent children from being socially marginalised and embarrassed because of oral diseases and their consequences (NACDH 2012).

Oral health revolves around the health of the tissues in the mouth—bones, gums, muscles and teeth—with the most common oral diseases affecting the gums (periodontal disease) and teeth (tooth decay). Poor oral health has been linked to various chronic conditions including:

- cardiovascular disease
- oral cancers
- lung conditions
- diabetes
- stroke
- adverse pregnancy outcomes (DHSV 2011).

Poor oral health can affect adults and children alike, but in children, it can have long-term negative effects that carry through to adulthood. As such, encouraging and maintaining good childhood oral health habits, and having access to oral health services, are important to prevent dental disease (NACDH 2012).

Data for Aboriginal and Torres Strait Islander children aged 5–14 show that, in 2011, dental caries accounted for 6.2% of the total non-fatal burden of disease for boys and 7.2% for girls (AIHW 2016).

Indigenous Australians are less likely to receive preventive dental care, and are more likely to have untreated dental disease or to be hospitalised due to oral health (Jamieson et al. 2010; Kruger & Tennant 2015).

Oral health in the Northern Territory

As at 30 June 2019, there were an estimated 23,100 Indigenous children aged under 16 in the Northern Territory—constituting 41% of its population aged under 16, the highest proportion of all Australian states and territories (ranging between 2% and 10% in the other jurisdictions) (AIHW analysis of ABS 2019, 2020).

Children in the Northern Territory have higher levels of tooth decay than in other states and territories (AIHW 2018b), and Indigenous children experience twice as much tooth decay as non-Indigenous children (AIHW 2018a).

Several factors contribute to the poorer oral health of Indigenous children, including:

- poverty and social disadvantage
- lack of access to appropriate diet, resulting in the consumption of processed sugary foods and drinks

- lower use of fluoridated toothpaste
- lack of fluoridated water
- limited or no access to dental services, especially in rural and remote areas.

Australian Government oral health programs in the Northern Territory

The Northern Territory Remote Aboriginal Investment Oral Health Program (NTRAI OHP)—funded by the Australian Government, and implemented by the Northern Territory Department of Health—is designed to complement and support existing public dental services.

The program began in July 2015 and will be funded until 2022. Funded activities aim to decrease the prevalence, incidence, severity and impact of oral health problems of Indigenous children in the Northern Territory (CFFR 2016). The program works with primary health-care providers to incorporate primary prevention into their services and deliver clinical oral health treatments to Indigenous children.

The NTRAI OHP supersedes the Child Health Check Initiative—Closing the Gap, or CHCI (CtG) (2007 to mid-2012) and the Stronger Futures in the Northern Territory (SFNT) (July 2012–June 2015) programs.

This report focuses on data collected from the SFNT and NTRAI programs, but also includes some long-term analyses of the change in oral health over 2009–2019. For more information on the history of the program, see Appendix A.

About this report

This report presents information on oral health services provided by the NTRAI OHP and the SFNT OHP to Indigenous children under the age of 16 in the Northern Territory. It is an update of the *Northern Territory Remote Aboriginal Investment: Oral Health Program July 2012 to December 2018* report.

Supplementary tables are available at <https://www.aihw.gov.au/reports/indigenous-australians/oral-health-for-aboriginal-and-torres-strait-child/data>.

The data include more than 20,000 children under the age of 16 who came through the SFNT/NTRAI OHP between July 2012 and December 2019.

Table 1.1 shows that the majority of children and young people aged 0–15 who received services through the NTRAI OHP received those services in *Remote* and *Very remote* areas. It also shows how the numbers relate to the Northern Territory Indigenous population aged 0–15 within the same remoteness areas.

Services provided under the NTRAI OHP are available territory-wide to Indigenous children under the age of 16, but mainly focus on remote areas, where they are most needed.

Children and young people who receive services through the NTRAI OHP are not a random sample of the population, so the data might not be representative of the general population of Indigenous children in the Northern Territory.

Parents or guardians of children must provide their consent to share information with the Australian Institute of Health and Welfare (AIHW). As a result, some information in this report is representative of children for whom consent was obtained, rather than of all children (see Chapter 2 for more information). In 2019, the consent rate ranged from 73% to 81% depending on the service type. Children can receive more than 1 service in a given period. The number of children can only be counted accurately for services where consent was given.

Not all dental services provided in the Northern Territory are captured within this report, as it includes only oral health services funded by the Australian Government through the NTRAI OHP.

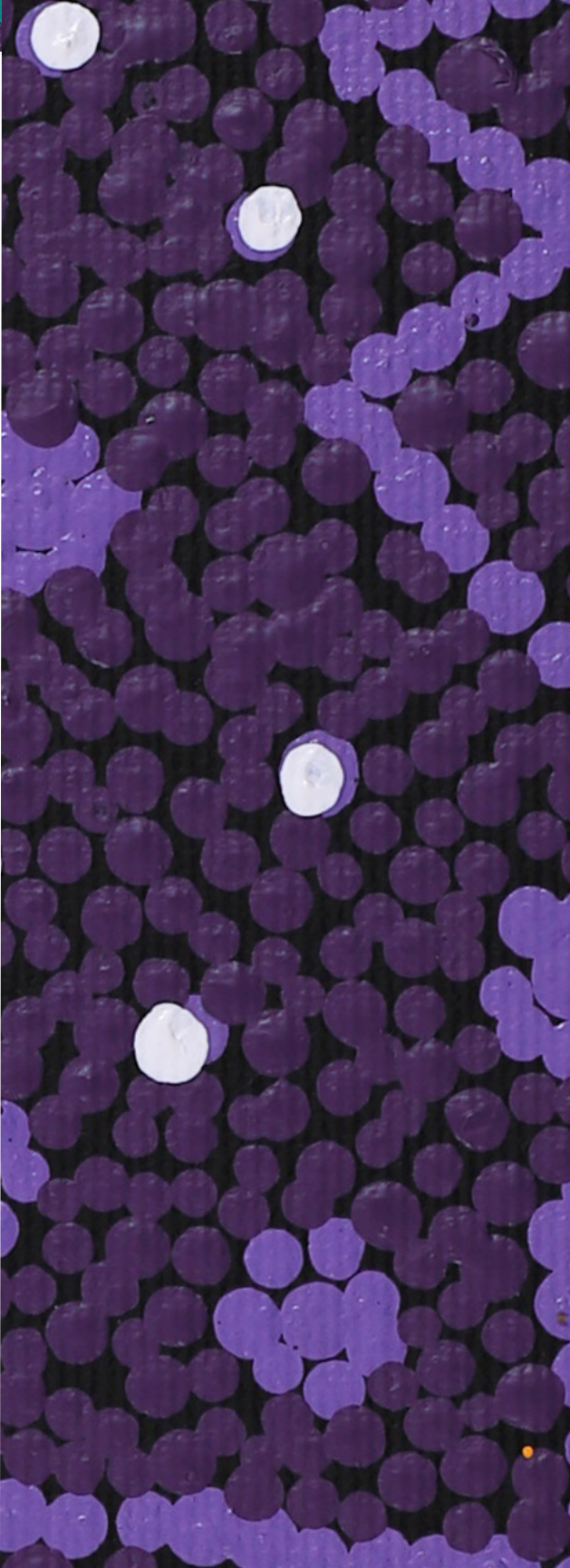
Table 1.1: Children aged 0–15 in the NTRAI OHP, and relationship to the Northern Territory Indigenous population^(a), by remoteness area, 2019

	Remoteness area			Total
	Outer regional	Remote	Very remote	
Number of NTRAI OHP children aged 0–15 ^(b)	541	1,143	2,772	4,456
Number of NTRAI OHP children aged 0–15 ^(b) as a percentage of the corresponding Northern Territory Indigenous population	9.1	24.1	22.5	19.3

(a) Children whose parent or guardian provided consent to share information with the AIHW as a proportion of the entire Northern Territory Indigenous population aged 0–15 within the corresponding remoteness area.

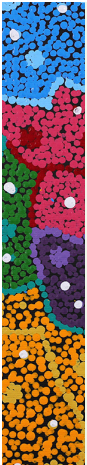
(b) Based on the location where the service was provided.

Source: NTRAI OHP data collection.



2

Dental service delivery



Key findings

In 2019, in the NTRAI OHP:

- more than 5,600 children received full-mouth fluoride varnish services
- more than 1,600 children received fissure sealant applications
- children aged 12–15 had the highest average number of teeth with fissure sealants (4.7 teeth per child)
- more than 3,550 children received clinical services, such as plaque removal, extractions, and restorative procedures—of whom about half (51%) were aged 6–11.

There are 2 main types of services delivered through the NTRAI OHP—preventive and clinical (Box 2.1).

Box 2.1: Types of services

Visit: An attendance (including scheduled and walk-in) at a dental clinic on a specific date. A single visit can involve multiple types of services.

Preventive services

Preventive service: Includes the removal of plaque and calculus, oral hygiene instruction, application of fissure sealants, application of full-mouth fluoride varnish, and other preventive services.

Full-mouth fluoride varnish: The application of a clinically determined amount of fluoride varnish (a concentrated form of fluoride) to the surfaces of the teeth.

Fissure sealants: The application of a protective adhesive to grooves in the biting surfaces of teeth at the back of the mouth, usually as soon as adult molars erupt. The sealants prevent dental plaque and acid build-up, and can last for many years, but require regular check-ups to see if the sealant is intact.

Clinical services

Clinical service: Can include restorative services, endodontics, tooth extractions, diagnostic services or assessments, orthodontic services and periodontic services (treatment of gums).

Clinical service visit: A visit where at least 1 clinical service was delivered (excluding visits where *only* full-mouth fluoride varnish application and/or fissure sealants were delivered).

What services are provided?

The NTRAI OHP provides clinical and preventive oral health services to Indigenous children in the Northern Territory. Figure 2.1 contains a broad overview of the services and the number of clinical and preventive services provided.

Preventive services are part of routine care in all dental clinics, and are provided as part of an individual's dental treatment plan. Specific preventive services include the application of full-mouth fluoride varnish and fissure sealants. Other preventive services include the removal of plaque/calculus, dietary advice or oral health education.

General dental services that are provided in all NTRAI OHP settings include:

- examinations
- restorative fillings
- extractions
- emergency care
- preventive services.

Consent rates

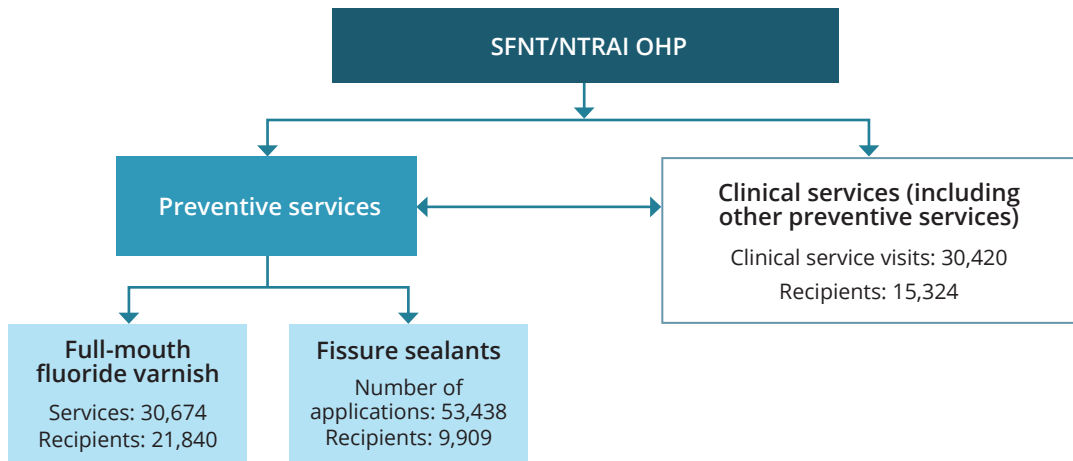
Parents or guardians of service recipients must provide their consent to share information with the AIHW. The demographic information in this report, apart from the number of services and service recipients, represents only children whose parent or guardian provided consent to share their information. In 2019, the consent rate ranged from 73% to 81% depending on the service type.

When a child's parent or guardian does not provide consent to share information, only a limited amount of combined information is provided to the AIHW. Due to this limited information, in this report the number of non-consent service recipients for most years in the program is estimated to be equal to the number of non-consent visits.

As children might have multiple visits, the total number of service recipients presented in Figure 2.1 might be an overestimate of the true number of children who had visits under the SFNT/NTRAI OHP. Children who had consent to share information and had multiple visits within the program, were included only once in the total number of service recipients between July 2012 and December 2019.

See Appendix A for more information.

Figure 2.1: Services provided under the SFNT/NTRAI OHP, July 2012 to December 2019



Notes

1. The 2-way arrows mean that a child can receive multiple types of services—for example, clinical services and preventive services, and services within the 2 categories.
2. A single clinical service visit can involve multiple types of services.
3. The number of fissure sealant applications is the number of teeth to which fissure sealants were applied.
4. The total number of service recipients includes children who did not have consent to share information with the AIHW. As such, for these children, the number of service recipients is estimated to be equal to the number of non-consent visits for most years of the program, and might be an overestimate of the true number of service recipients. Children with consent to share information, and who had multiple visits during the program were included only once in the total number of service recipients within each service type.

Sources: Tables S2.1, S2.3, S2.6.

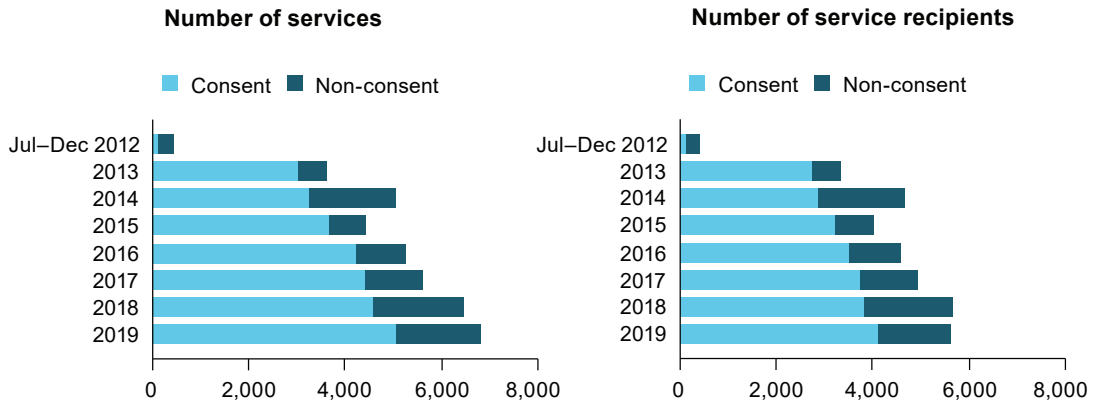
How many children had full-mouth fluoride varnish and fissure sealant services?

Full-mouth fluoride varnish

Full-mouth fluoride varnish has been shown to decrease the incidence of tooth decay by up to 25%–45% when professionally applied 2–4 times per year. It is considered to be a valuable public health intervention (Bonetti & Clarkson 2016; Marinho et al. 2013):

- In 2019, 5,614 children received 6,807 full-mouth fluoride varnish services (Figure 2.2).
- Between July 2012 and December 2019, 21,840 children received 37,674 full-mouth fluoride varnish services. This includes 12,721 children with consent to share information with the AIHW.
- The number of services and service recipients increased steadily between 2015 and 2019.

Figure 2.2: Full-mouth fluoride varnish services and service recipients, July 2012 to December 2019

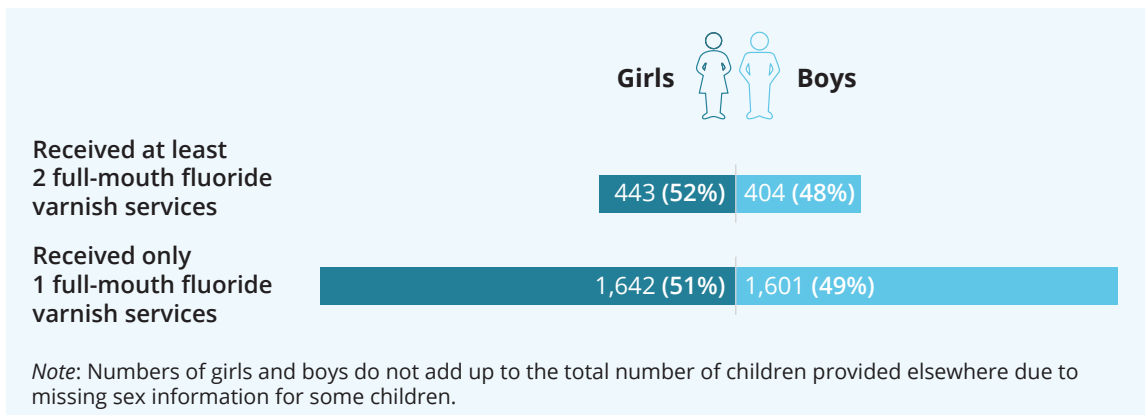


Note: Consent refers to the services and service recipients where consent to share information with the AIHW was provided by the service recipient's parent or guardian. Where a parent or guardian does not provide consent to share information, only a limited amount of combined information is provided to the AIHW. Due to this limited information, in this report the number of non-consent service recipients for most years is estimated to be equal to the number of non-consent visits.

Source: Table S2.1.

Consent rates to share information have fluctuated over the years. The consent rate for children receiving full-mouth varnish services was 73% in 2019.

In 2019, of those who received full-mouth fluoride varnish services, a slightly higher percentage were girls than boys.

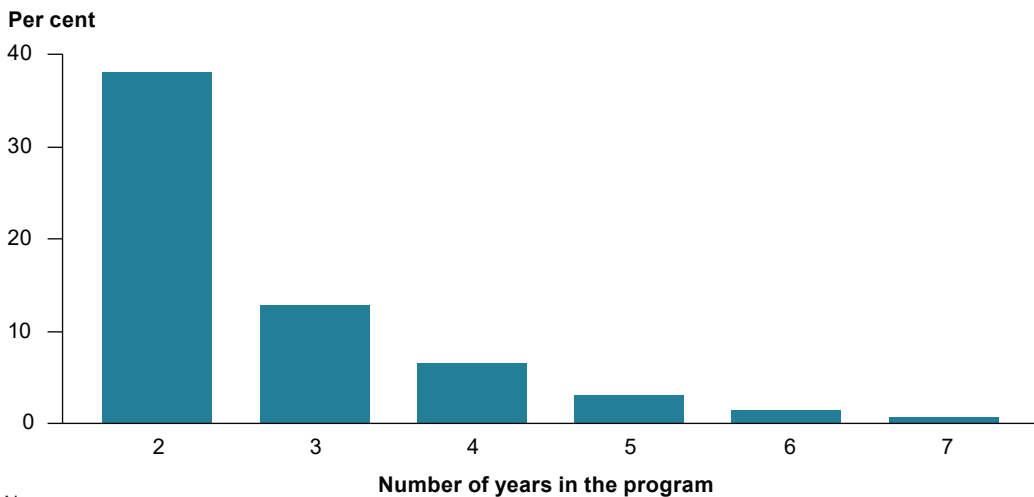


Ideally, full-mouth fluoride varnish services should be provided at least twice a year, but some studies have shown that 1 application per year can slightly reduce tooth decay (Arruda et al. 2011; Weintraub et al. 2006).

The proportion of service recipients receiving an annual fluoride varnish service decreased the longer children stayed in the program (Figure 2.3). Among children who received their first service in 2013 (7 years in the program), only 1% had an annual fluoride varnish service.

However, it was difficult to follow up children accurately because in each year since 2015 about 20%–30% of parents or guardians of children who received fluoride varnish services did not give consent to share their information with the AIHW.

Figure 2.3: Service recipients over the period 2013 to 2019 who received an annual fluoride varnish service, by number of years in the SFNT/NTRAI OHP



Notes

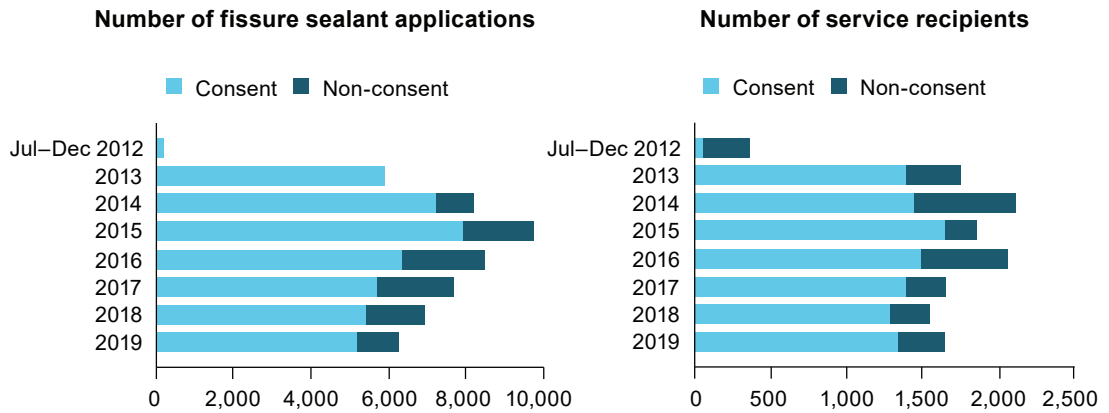
1. Only includes service recipients aged 15 or under who were still eligible for services through the NTRAI OHP in 2019.
2. Excludes service recipients whose parent or guardian did not consent to share information.

Source: Table S2.11.

Fissure sealants

- In 2019, 1,612 children had fissure sealants applied to 6,266 teeth (Figure 2.4).
- The number of children in the program who received fissure sealant applications fluctuated over time. In 2019, the number of children who received fissure sealants increased slightly from 2018, while the number of teeth with fissure sealant application decreased.
- Over the period from July 2012 to December 2019, 9,909 children received fissure sealant applications to 53,438 teeth. This includes 6,965 children for whom consent to share information with the AIHW was provided.
- Consent rates to share information have fluctuated since the start of the program. The rate of consent was 81% in 2019.

Figure 2.4: Fissure sealant applications and service recipients, July 2012 to December 2019



Notes

1. Fissure sealant applications refers to the number of teeth that fissure sealants were applied to.
2. Non-consent data for the number of teeth that fissure sealants were applied to were only available from July 2014.

Source: Table S2.3.

A fissure sealant can be applied to numerous teeth during 1 visit. In 2019, among the 1,612 children and young people who had fissure sealants applied, 1,308 (81%) had information recorded on the number of teeth to which fissure sealants were applied. These service recipients had a fissure sealants applied to an average of 4.0 teeth.

Among the 620 children who received a fissure sealant service in 2019 and had their dmft/DMFT score recorded, 502 had existing caries. Children with existing caries had, on average, fissure sealants applied to fewer teeth compared with children with no existing caries (3.6 and 4.4 teeth, respectively).

Children who had fissure sealant applications, by caries status, 2019



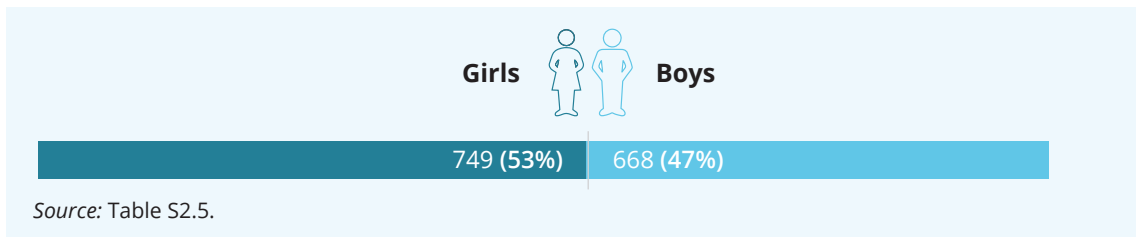
Children **with no existing caries** had an average of **4.4 teeth** with fissure sealants



Children **who had existing caries** had an average of **3.6 teeth** with fissure sealants

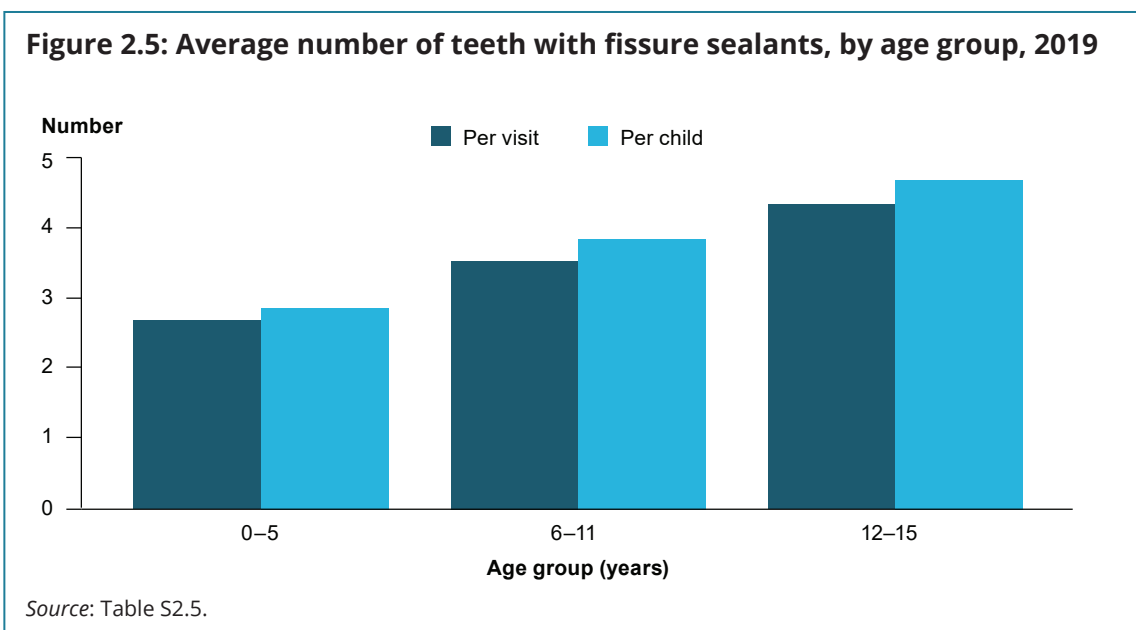
Source: Table S2.4.

Girls had more visits than boys for fissure sealant applications in 2019.



Children aged 6–11 made up the largest proportion (65%) of those who received fissure sealants through the NTRAI OHP in 2019. However, children aged 12–15 had the highest average number of fissure sealants per child (4.7) (Figure 2.5). The lower averages for younger children are expected because fissure sealants should be applied to permanent teeth.

Figure 2.5: Average number of teeth with fissure sealants, by age group, 2019



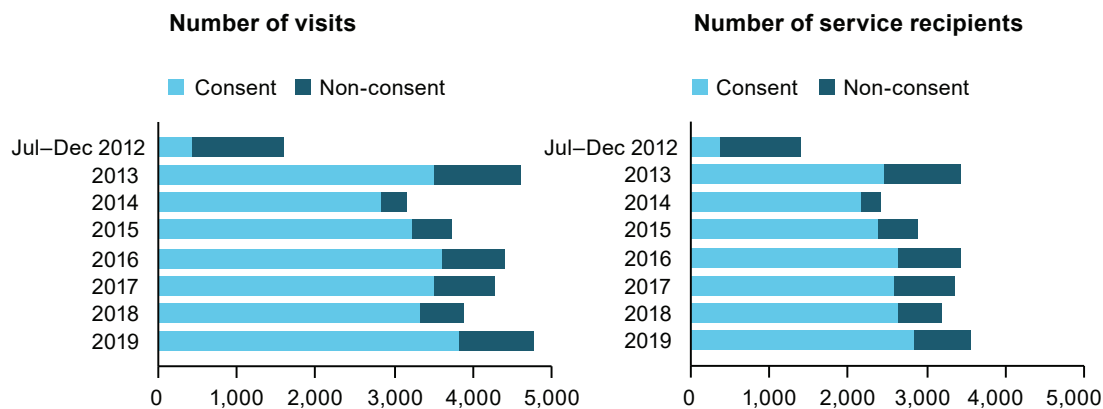
How many children had clinical service visits?

Clinical service visits can include restorative services, endodontics, tooth extractions, diagnostic services or assessments, orthodontic services and periodontic services (treatment of gums).

- In 2019, 3,552 children received 4,780 clinical service visits (Figure 2.6).
- Between July 2012 and December 2019, 15,324 children received 30,420 clinical service visits. This includes 9,663 children with consent to share information with the AIHW.

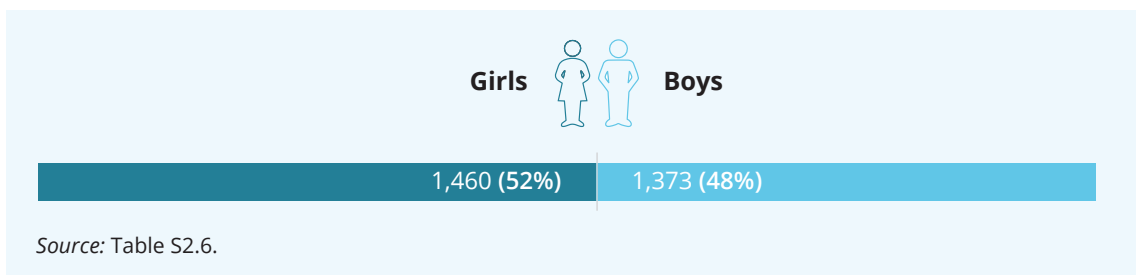
- The number of visits and service recipients have fluctuated over the years, but were higher in 2019 than in 2018.
- Consent rates have fluctuated over time, ranging between 72% of service recipients in 2013 to 91% in 2014. The consent rate in 2019 was 80%.

Figure 2.6: Clinical service visits and service recipients, July 2012 to December 2019



Source: Table S2.6.

Overall, in 2019, girls made up a slightly higher proportion of children receiving clinical service visits than boys.



Source: Table S2.6.

In 2019, the majority of children who received a clinical service visit were aged 6–11 (51%), followed by those aged 0–5 (26%) and 12–15 (23%) (Table S2.7).

Services provided

In 2019, almost all children who received a clinical service visit in the NTRAI OHP received diagnostic (assessment) services and preventive services other than full-mouth fluoride varnish and fissure sealants. Preventive services include dental prophylaxis (for example, removal of plaque and calculus), as well as dietary advice, oral hygiene instruction and mouthguards.

Types of clinical services provided through the NTRAI OHP in 2019:



Notes

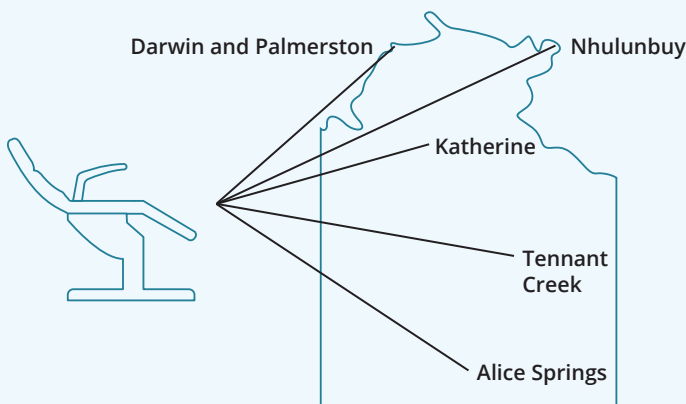
1. Only children who had a clinical service visit and provided consent to share information were included.
2. The percentages equate to over 100% as children can receive multiple types of services in 1 visit.


Source: Table S2.8.

How were services delivered?

The NTRAI OHP services are provided across the Northern Territory, in multi-chair community clinics, as well as through single-chair clinics found in urban and regional primary schools. To improve access to oral health services in remote areas, single-chair clinics are also found in remote community health centres or delivered through mobile dental trucks.

Multi-chair community clinics where NTRAI OHP services are delivered





Dental services provided under general anaesthetic are carried out by Oral Health Services Northern Territory staff in the Northern Territory. Dental services are provided to children under general anaesthetic for the treatment of dental disease and include dental extractions, fillings and metal crowns. Full-mouth fluoride varnish may be provided during the course of the procedure, but is not reported as a preventive service in this instance. Since 2015, data related to services provided under general anaesthetic have not been provided to the AIHW, so the services are not included in this report.

Mobile dental trucks are used to reach many remote communities in Central Australia. Outreach dental service teams comprising a dentist or a dental/oral health therapist and dental assistant travel to remote communities in Central Australia for 1–3 weeks at a time. Some teams also travel to remote single-chair clinics.

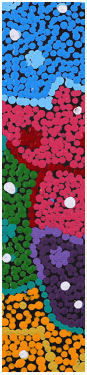
Remote community health centres are primarily used for service delivery in the Top End—the northern region of the Northern Territory—where dental teams use a single-chair clinic to provide dental services for 1–3 weeks at a time.

Distance, transport, unpredictable weather, cost and accommodation availability are all factors that challenge service delivery in remote areas of the Northern Territory. However, the NTRAI OHP complements and supports services in remote areas that are funded by the Northern Territory Government, enabling more visits and more equitable access to oral health services.



3

Oral health status



Key findings

In 2019, among Indigenous children in the NTRAI OHP:

- those aged 8–9 were the most likely to have tooth decay experience (84%)
- those aged 6 had the highest average number of decayed, missing and filled teeth
- generally, the proportion of those who experienced tooth decay fell over time.

How many children had decayed, missing and filled teeth?

Tooth decay is the most prevalent oral disease among children and adults. So a widely used indicator to measure oral health status is a count of the number of decayed, missing or filled teeth. The decayed, missing or filled teeth (dmft or DMFT) score is a measure of the number of such teeth a child has (Box 3.1).

Box 3.1: The dmft and DMFT score

The dmft or DMFT score counts the number of teeth that are decayed, missing or filled. Lower case dmft refers to deciduous or baby teeth, while upper case DMFT refers to permanent or adult teeth.

For example, a dmft score of 5 means that a child has 5 decayed, missing or filled deciduous teeth.

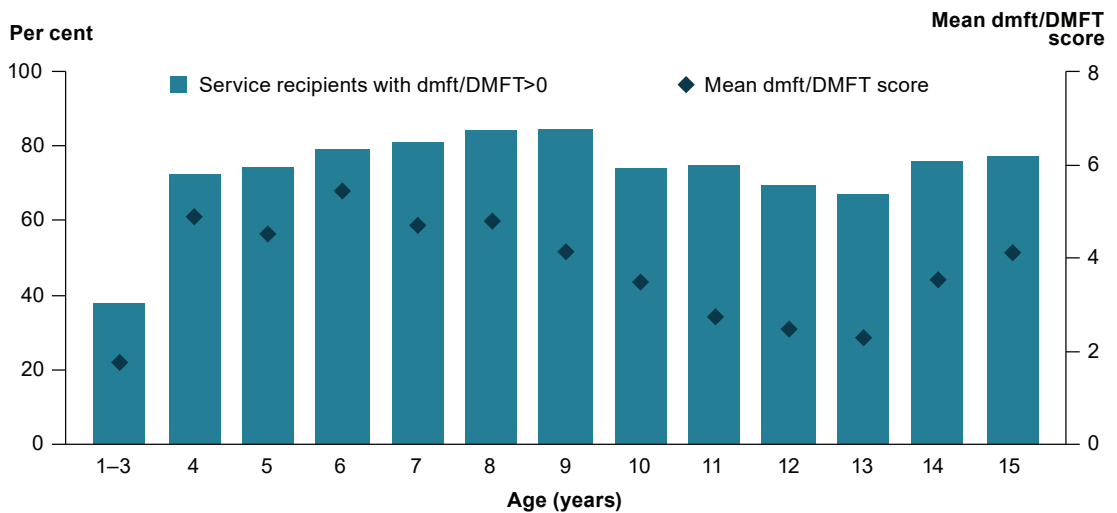
When children have a dmft/DMFT score that is greater than 0, this is known as having caries or tooth decay experience.

The proportion of children with tooth decay experience (a dmft/DMFT score greater than 0) varied with age (Figure 3.1). Children aged 6–9 had the highest percentages of tooth decay experience in 2019, with:

- 85% of those aged 9 experiencing tooth decay
- 84% of those aged 8 experiencing tooth decay
- 81% of those aged 7 experiencing tooth decay
- 79% of those aged 6 experiencing tooth decay.

The highest mean dmft/DMFT scores were among children aged 6 (5.4) and 4 (4.9).

Figure 3.1: Children with tooth decay experience, by age, 2019



Source: Table S3.1.

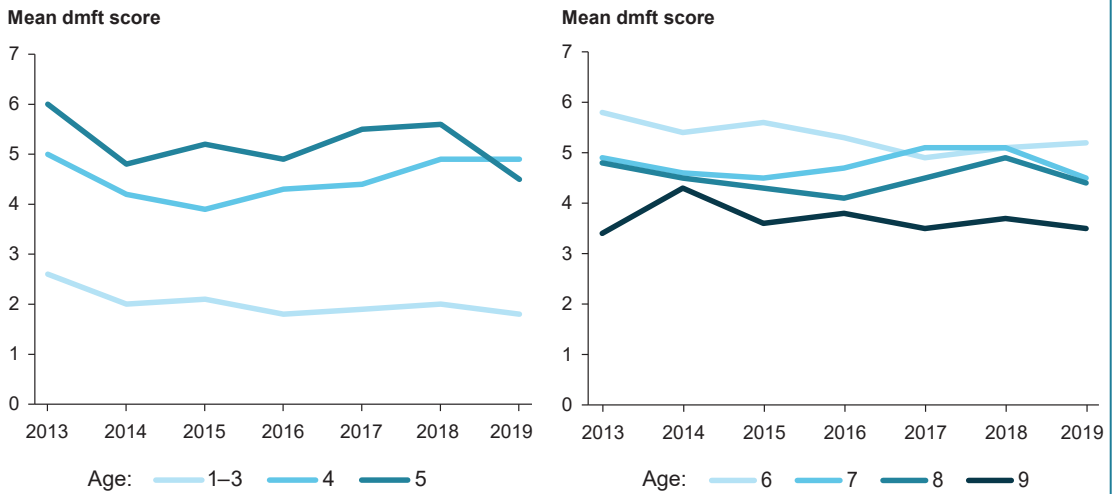
In general, mean dmft scores were higher than mean DMFT scores, meaning that more decayed, missing and filled teeth were found among children’s baby teeth. In 2019:

- children aged 6 had the highest average dmft score (5.2)
- children aged 15 had the highest average DMFT score (4.0).

The proportion of children who experienced decay differed with age and over time (figures 3.2 and 3.3). Between 2013 and 2019, the mean dmft or mean DMFT also varied by age. Children aged 1-3 and young people aged 12 experienced the largest decreases in dmft and DMFT scores, respectively. Compared to 2013, in 2019 the average number of decayed, missing or filled teeth decreased by:

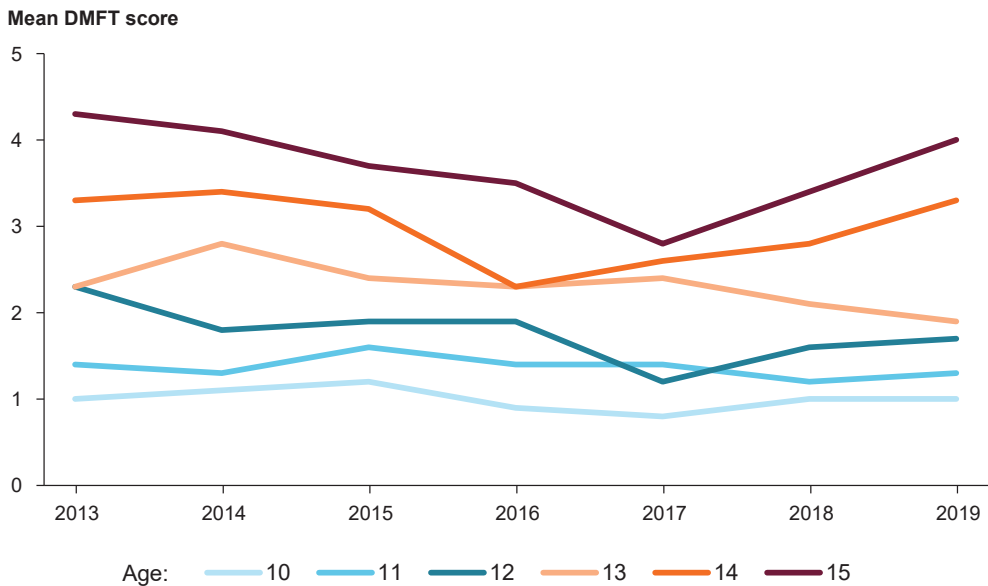
- 31% among children aged 1-3 (dmft)
- 26% among children aged 12 (DMFT).

Figure 3.2: Mean dmft score among children aged 1–9, by age, 2013–2019



Sources: tables S3.1, S3.2, S3.3, S3.4, S3.5 and S3.6.

Figure 3.3: Mean DMFT score among children aged 10–15, by age, 2013–2019



Sources: tables S3.1, S3.2, S3.3, S3.4, S3.5 and S3.6.

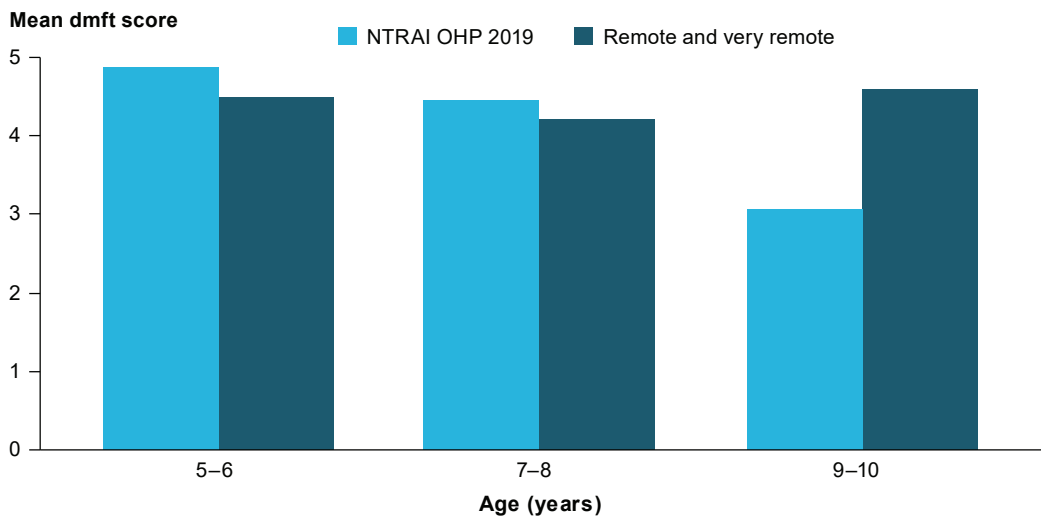
Children in the NTRAI OHP compared with other Australian children

The National Child Oral Health Study 2012–14 provides a snapshot of Australian children’s oral health. Data were collected from children aged 5–14, living in all Australian states and territories, and 5.5% of the total respondents were Aboriginal or Torres Strait Islander (Ha et al. 2016).

As services provided under the NTRAI OHP are mainly focused on Indigenous children and young people living in remote areas of the Northern Territory, the mean dmft/DMFT score of children from the program was compared with other Australian children living in *Remote and very remote* areas.

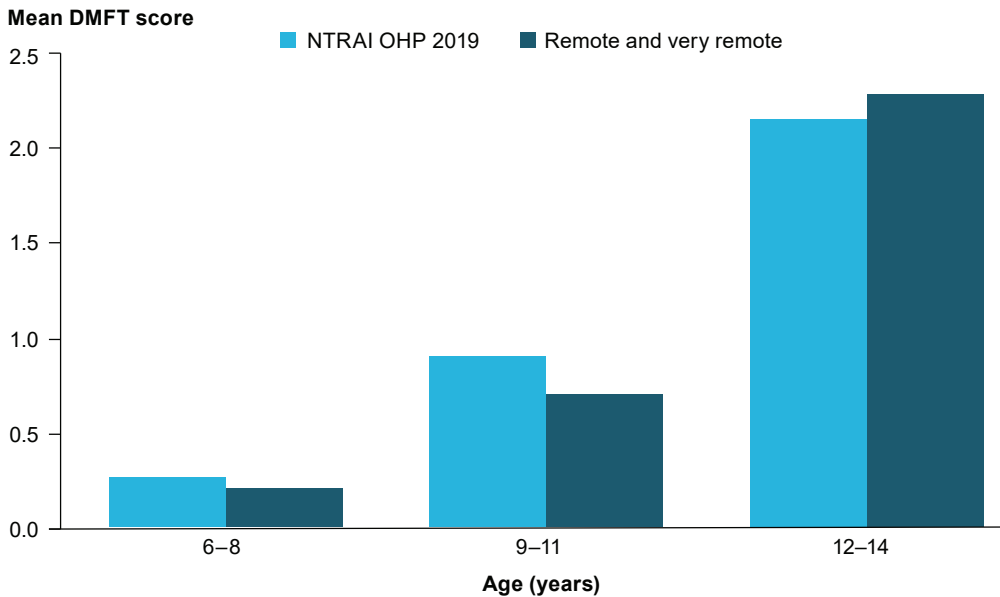
Children aged 5–8 in the NTRAI OHP had slightly higher mean dmft scores than all children living in *Remote and very remote* areas (Figure 3.4). For children with permanent teeth, DMFT scores were similar between those aged 6–14 in the NTRAI OHP and all children living in *Remote and very remote* areas (Figure 3.5).

Figure 3.4: Mean dmft score among children in the NTRAI OHP (2019) and all children living in *Remote and very remote* areas (2012–14)



Sources: Table S3.1; National Child Oral Health Study 2012–14.

Figure 3.5: Mean DMFT score among children in the NTRAI OHP (2019) and all children living in *Remote and very remote* areas (2012–14)



Sources: Table S3.1; National Child Oral Health Study 2012–14.

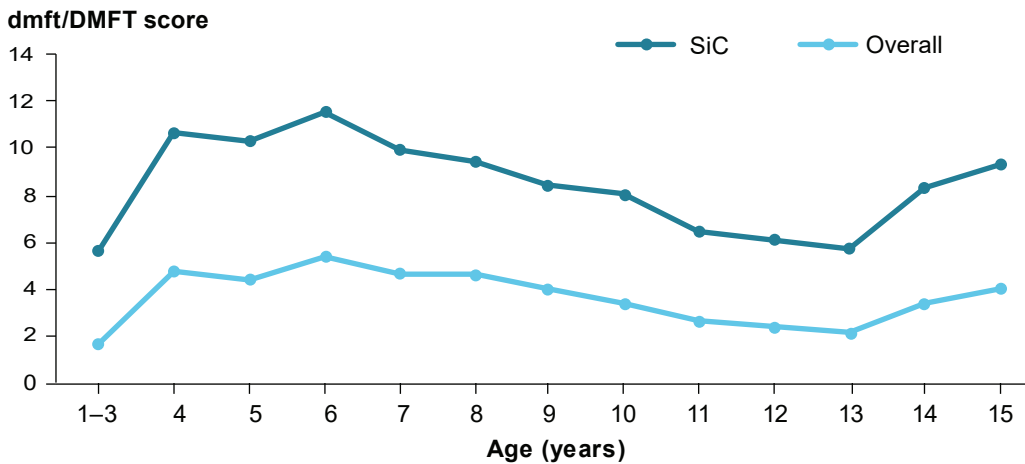
Significant Caries Index

The Significant Caries Index (SiC) is used to pinpoint children who have the most tooth decay experience in a group. In the NTRAI OHP, the SiC value is the average number of dmft/DMFT among children with the highest 30% of dmft/DMFT scores of all children in the program.

Figure 3.6 shows the difference between the mean dmft/DMFT scores among children with SiC values and all children in the NTRAI OHP.

In 2019, children in the NTRAI OHP with the highest 30% of dmft/DMFT scores (SiC values) had scores that were 2–3 times as high as those of all children in the NTRAI OHP overall.

Figure 3.6: SiC and mean total dmft/DMFT scores of children in the NTRAI OHP, by age, 2019



Note: The SiC value is the mean dmft/DMFT score among children in the NTRAI OHP who have the highest 30% of dmft/DMFT scores (the most tooth decay experience).

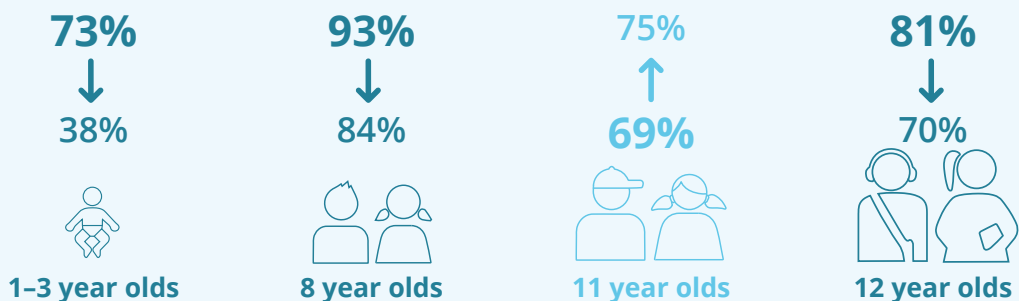
Source: Table S3.1.

How has tooth decay experience changed over time?

Although this report focuses on services provided between July 2012 and December 2019, information from 2009 to June 2012 is included in this section to describe long-term trends over time.

From March 2009 to December 2019, the proportion of children with tooth decay experience fell for most ages, though it rose from 69% to 75% for children aged 11.

Tooth decay experience from March 2009 to December 2019



Source: Table S3.8

Changes over time could be associated either with changes in the sample of children who were in the program at different times, or with actual changes in tooth decay experience among children in the program. Results are based on data made available to the AIHW periodically, and are not representative of the whole population.

Changes over time and differences across CHCI(CtG) and NTRAI OHP

Another way to look at the changes in children's oral health among programs is to compare tooth decay experience in the same children across multiple visits. Data from the CHCI(CtG) are available from August 2008 to June 2012 and can be compared with the SFNT/NTRAI OHP data from July 2012 to December 2019.

The change in dmft/DMFT for children who had at least 2 dmft/DMFT records in 1 of the CHCI(CtG) or SFNT/NTRAI OHP time periods was investigated. A time gap of at least 3 months between visits was included to allow for enough time to see changes in oral health. As well, to truly compare the programs, children who had visits in both programs were excluded.

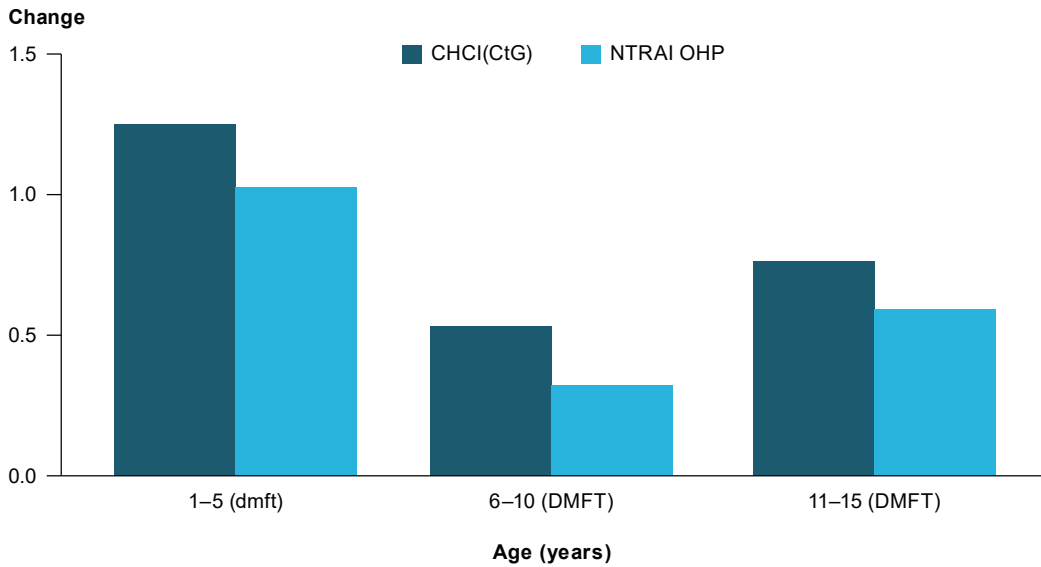
Through both programs, tooth decay fell over time, measured by an increment in dmft or DMFT score per person-year (Figure 3.7):

- For baby teeth in children aged 1–5 and for permanent teeth in children aged 6–10 and 11–15, increases in tooth decay were lower in the NTRAI OHP.
- Tooth decay fell for all age groups when comparing between the CHCI(CtG) and the NTRAI OHP:
 - by 18% for those aged 1–5
 - by 40% for those aged 6–10
 - by 22% for those aged 11–15.

Changes over time could be explained by various factors:

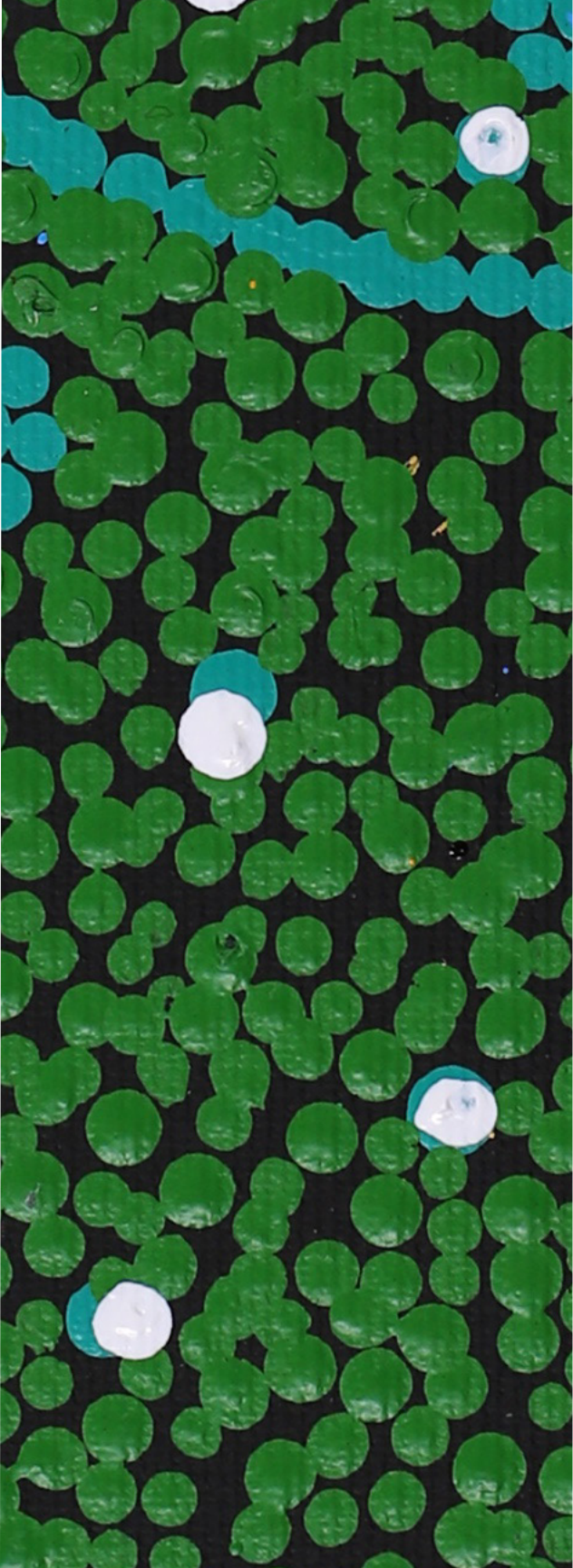
- Preventive interventions (for example, full-mouth fluoride varnish) introduced at the population level through the SFNT/NTRAI OHP could decrease tooth decay.
- The CHCI(CtG) cohort is relatively small, and the smaller sample size could cause variability in the findings.
- Children aged 6–10 have fewer teeth because their permanent teeth are still developing after they have lost their baby teeth. This could be a reason for this age group having the smallest increase in dmft/DMFT over time.

Figure 3.7: Changes in average dmft or DMFT score per person-year among children who had at least 2 visits, August 2008 to December 2019



Note: Change in average dmft or DMFT score is measured by an increment in dmft or DMFT score per person-year. A lower dmft or DMFT score indicates a lower rate of decay.

Source: Table S3.9.



4

Progress against benchmarks

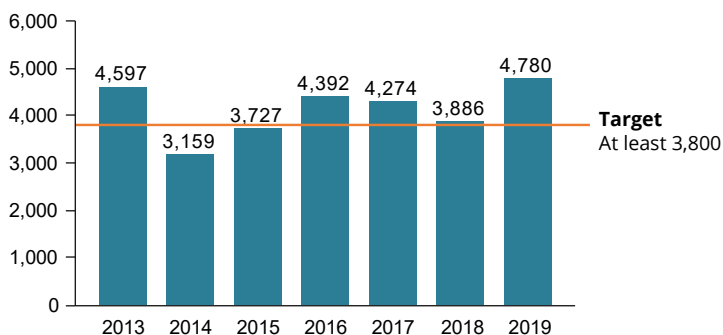
Progress against benchmarks

The NTRAI OHP has performance indicators and benchmarks to monitor the outcomes achieved through the program. The targets are set jointly by the Australian and Northern Territory departments of health, through the Northern Territory Health Implementation Plan (CFFR 2016).

Service delivery targets

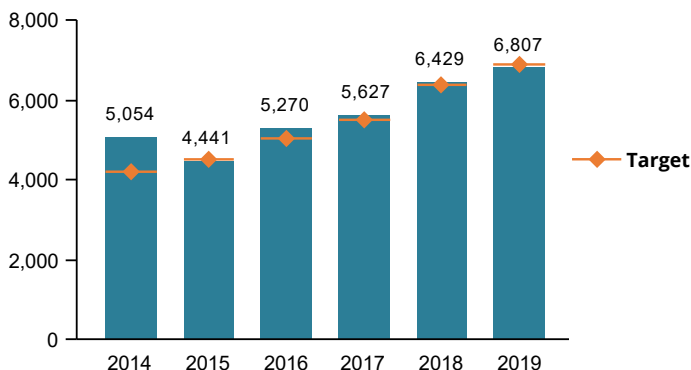
Indicator:
Clinical service visits provided

Target: 3,800 occasions of **clinical service** per year



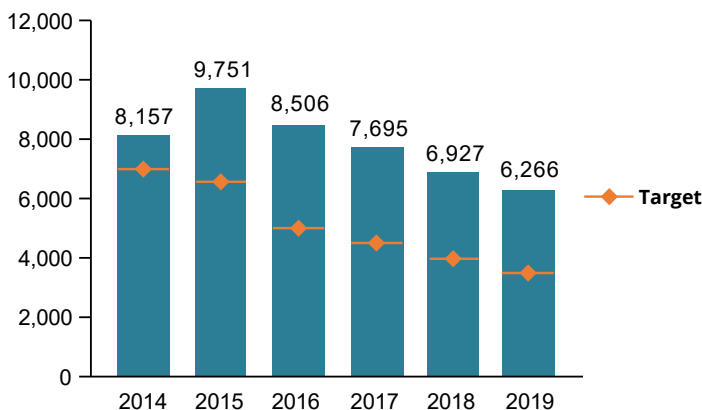
Indicator:
Fluoride varnish applications

Target: 6,908 **fluoride varnish** applications in 2019



Indicator:
Fissure sealant applications

Target: **Fissure sealant** applications to 3,500 teeth in 2019

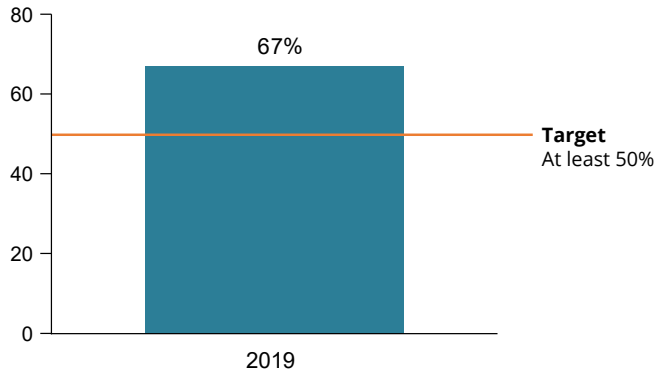


Note: The declining number of fissure sealants is due to the one-time only application of fissure sealants per tooth as well as to clinicians determining the most appropriate clinical treatment.

Health outcome targets

Indicator:
Prioritisation of preventive services

Target: At least 50% of total service items are **preventive services**



Note: The data for the preventive services target include fissure sealants, full-mouth fluoride varnish and preventive services (for example, removal of plaque/calculus) that were provided during clinical visits. Only data where consent was obtained to share information were used.

Appendix A: About the Northern Territory Remote Aboriginal Investment Oral Health Program data collection

Data collection, management and reporting

The Department of Health commissioned the Australian Institute of Health and Welfare (AIHW) to collect, manage and report on oral health services data provided through the Northern Territory Remote Aboriginal Investment Oral Health Program (NTRAI OHP).

The data are extracted from an electronic information system in which dental professionals record clinical information, before the data are sent electronically to the AIHW.

Children who receive oral health services under the NTRAI OHP are not a random sample of Indigenous children in the Northern Territory. Further, not all dental services provided in the Northern Territory are captured in the NTRAI dental data collection, because it includes only oral health services funded by the Australian Government through the NTRAI OHP. Services provided through other funding sources (for example, the Northern Territory Government or private sector) are not included in this report. As a result, findings in this report are not representative of all Indigenous children in the Northern Territory.

The data the AIHW receives rely on parents or guardians of service recipients providing their consent to share individual information. Detailed information on dental services are sent to the AIHW only when consent is given. In cases where that consent is not given, the AIHW receives only a limited amount of combined information.

Due to this limited information, the number of non-consent service recipients presented in this report for most years is estimated to be equal to the number of non-consent services. As a result, apart from the total number of services and service recipients, other information in this report is representative of children for whom consent was obtained, rather than of all service recipients.



History of the program

Services provided by the NTRAI OHP were originally a part of the Child Health Check Initiative (CHCI), a response to the poor oral health found among Indigenous children in the Northern Territory National Emergency Response prescribed areas in mid-2007.

The program later continued under the Closing the Gap (CtG) initiative in the Northern Territory National Partnership Agreement from mid-2009 to mid-2012. These 2 programs, from 2007 to mid 2012, are collectively referred to as the CHCI(CtG). Improvements were seen in the oral health of children who received services through CHCI(CtG) oral health programs, which shows their importance.

As a result of these improvements in oral health, the Australian Government continued to fund, and also expanded, the program under the Stronger Futures in the Northern Territory Oral Health Program (SFNT OHP) from July 2012 to June 2015. This program has been continued through the NTRAI OHP since July 2015 and will be funded until 2022.

Appendix B: Data quality statement

SFNT/NTRAI OHP dental data collection summary

- This data collection included more than 20,000 Indigenous children and adolescents aged 0–15 who received oral health services under the SFNT OHP and, later, the NTRAI OHP.
- Data collected as part of the SFNT/NTRAI OHP are a by-product of a clinical process. Dental professionals who provide clinical services document the results on standard data collection forms or in a computer-based data collection system.
- In the first 6 months of the SFNT/NTRAI OHP (July to December 2012), the consent rate to share data with the AIHW was low (27% for clinical service visit recipients, 26% for full-mouth fluoride varnish recipients, and 22% for fissure sealant recipients), so data collected in this period are not representative of all SFNT dental services and service recipients. Consent rates fluctuated since the initial period for all services in the collection. In 2019 consent rates for service recipients were 80% for clinical service visits, 73% for full-mouth fluoride varnish recipients and 81% for fissure sealant recipients.

A full data quality statement for the SFNT/NTRAI OHP dental data collection can be found online at <https://meteor.aihw.gov.au/content/index.phtml/itemId/741715>.

Acknowledgments

Ms Bin Tong, Ms Ruth Penm and Ms Kate Gersekowski of the AIHW's Indigenous Group prepared this report. The authors appreciate the assistance of Ms Isabella Stephens, and thank Dr Fadwa Al-Yaman, Mr Geoff Callaghan, Ms Jessica Cargill and Ms Pooja Chowdhary of the AIHW, for their guidance and comments.

The authors are grateful for the expert review comments from Professor Woosung Sohn (University of Sydney) and Dr John Skinner (University of Sydney).

The Department of Health provided funds to support data collection and report production, and members of the Indigenous Health Division are thanked for their comments on this report.

The authors also acknowledge the assistance, cooperation and feedback of the Northern Territory Department of Health. Special thanks go to the many clinicians and administrators who supported this data collection while also providing clinical services in remote locations across the Northern Territory.

As well, the authors wish to thank the families of the children who consented to share their information with the AIHW for this report.

Abbreviations

AIHW	Australian Institute of Health and Welfare
CHCI(CtG)	Child Health Check Initiative/Closing the Gap program
dmft	decayed, missing or filled deciduous (baby) teeth
DMFT	decayed, missing or filled permanent (adult) teeth
NTRAI	Northern Territory Remote Aboriginal Investment
OHP	Oral Health Program
SFNT	Stronger Futures in the Northern Territory
SiC	Significant Caries Index

Glossary

deciduous (baby) teeth: Primary teeth that develop during the embryonic stage of human development and erupt (that is, become visible in the mouth) during infancy. They are usually lost and replaced by permanent teeth, but in the absence of permanent replacements, can remain functional for many years.

dental caries: A biofilm-mediated disease that can lead to cavities (small holes) in the tooth structure which compromise both the structure and the health of the tooth, and commonly known as tooth decay.

diagnostic services: Services that include:

- examinations (consultations; written reports; referrals; and initial, periodic and emergency oral examinations)
- radiographical examination and interpretation (intraoral radiographs and skull radiographs)
- other diagnostic services (including bacteriological examinations, antibiotic sensitivity tests, biopsies and models).

dmft: Decayed, missing or filled **deciduous (or baby) teeth**.

DMFT: Decayed, missing or filled **permanent (or adult) teeth**.

dmft/DMFT: The score for **deciduous (baby) teeth** and **permanent teeth** combined (that is, dmft + DMFT).

endodontics: Pulp or nerve treatments (pulp capping, pulpotomy, extirpation or debridement of root canal).

extraction: Removal of permanent or deciduous tooth or tooth fragment.

fissure sealants: Protective adhesive applied to grooves in the biting surfaces of teeth at the back of the mouth, usually as soon as adult molars erupt. The sealants prevent dental plaque and acid build-up, and can last for many years; however, regular check-ups are required to see if the sealant is intact.

full-mouth fluoride varnish: A clinically determined amount of fluoride varnish (a concentrated form of fluoride) applied to the surfaces of teeth.

Indigenous: A person of Aboriginal or Torres Strait Islander descent who identifies as an Aboriginal or Torres Strait Islander and is accepted as such by the community in which they live.

permanent teeth: Adult or secondary teeth that start to erupt at about 6 years of age. By about age 21, a person usually has 32 permanent teeth.



preventive services: Services including:

- dental prophylaxis (removal of plaque, removal of calculus, recontouring of existing restorations)
- topical fluoride (application of fluoride solution or gel, instruction on self-application)
- other preventive services (including dietary advice, oral hygiene instruction, fissure sealing and provision of mouthguards).


restorative services: Removal of diseased tooth structures and replacement with amalgams, glass ionomer, silicate and composite resins (filling of 1, 2, 3 or more surfaces).

Significant Caries Index (SiC): Mean **dmft/DMFT** score among children who have the highest 30% of dmft/DMFT scores.

tooth decay experience: A dmft/DMFT score greater than 0.

References

- ABS (Australian Bureau of Statistics) 2019. Estimates and projections of Aboriginal and Torres Strait Islander Australians. Canberra: ABS. Viewed 5 January 2021, <https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/estimates-and-projections-aboriginal-and-torres-strait-islander-australians/latest-release>.
- ABS 2020. National, state and territory population. Canberra: ABS. Viewed 5 January 2021, <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release>.
- AIHW (Australian Institute of Health and Welfare) 2016. Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011. Australian Burden of Disease Study series no. 6. Cat. no. BOD 7. Canberra: AIHW.
- AIHW 2018a. Northern Territory Remote Aboriginal Investment Oral Health Program July 2012 to December 2016. Cat. no. IHW 190. Canberra: AIHW.
- AIHW 2018b. Oral health and dental care in Australia. Cat. no. DEN 231. Canberra: AIHW.
- AIHW 2019. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2015. Cat. no. BOD 22. Canberra: AIHW.
- Arruda AO, Senthamarai Kannan R, Inglehart MR, Rezende CT & Sohn W 2011. Effect of 5% fluoride varnish application on caries among school children in rural Brazil: a randomized controlled trial. *Community Dentistry and Oral Epidemiology* 40(3):267–76.
- Bonetti D & Clarkson JE 2016. Fluoride varnish for caries prevention: efficacy and implementation. *Caries Research* 2016, 50 (Supplement 1):45–9.
- CFFR (Council on Federal Financial Relations) 2016. Northern Territory Health Implementation Plan. Canberra: Council of Australian Governments.
- DHSV (Dental Health Services Victoria) 2011. Links between oral health and general health – the case for action: Dental Health Services Victoria. Melbourne: DHSV. Viewed 10 October 2019, https://www.dhsv.org.au/_data/assets/pdf_file/0013/2515/links-between-oral-health-and-general-health-the-case-for-action.pdf.
- Ha D, Roberts-Thomson K, Arrow P, Peres K & Do L 2016. Children’s oral health status in Australia, 2012–14. In: Do LG & Spencer AJ (eds). *Oral health of Australian children: the National Child Oral Health Study 2012–14*. Adelaide: University of Adelaide, 86–152.
- Jamieson LM, Roberts-Thomson KF & Sayers SM 2010. Risk indicators for severe impaired oral health among Indigenous Australian young adults. *BMC Oral Health* 10(1):1–11.



Kruger E & Tennant M 2015. Potentially preventable hospital separations related to oral health: a 10-year analysis. *Australian Dental Journal* 60(2):205–11.

Marinho VCC, Worthington HV, Walsh T & Clarkson JE 2013. Fluoride varnishes for preventing dental caries in children and adolescents. *Cochrane Database of Systematic Reviews* 2013(7):CD002279. doi:10.1002/14651858.CD002279.pub2.

NACDH (National Advisory Council on Dental Health) 2012. Report of the National Advisory Council on Dental Health. Canberra: NACDH.

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

List of tables

Table S1: Progress against benchmarks, 2019.....	vii
Table 1.1: Children aged 0–15 in the NTRAI OHP and relationship to the Northern Territory Indigenous population, by remoteness area, 2019.....	4

List of figures

Figure 2.1: Services provided under the SFNT/NTRAI OHP, July 2012 to December 2019.....	8
Figure 2.2: Full-mouth fluoride varnish services and service recipients, July 2012 to December 2019	9
Figure 2.3: Service recipients over the period 2013 to 2019 who received an annual fluoride varnish service, by number of years in the SFNT/NTRAI OHP	10
Figure 2.4: Fissure sealant applications and service recipients, July 2012 to December 2019	11
Figure 2.5: Average number of teeth with fissure sealants, by age group, 2019.....	12
Figure 2.6: Clinical service visits and service recipients, July 2012 to December 2019.....	13
Figure 3.1: Children with tooth decay experience, by age, 2019	18
Figure 3.2: Mean dmft score among children aged 1–9, by age, 2013–2019	19
Figure 3.3: Mean DMFT score among children aged 10–15, by age, 2013–2019	19
Figure 3.4: Mean dmft score among children in the NTRAI OHP (2019) and all children living in <i>Remote and very remote</i> areas (2012–14).....	20
Figure 3.5: Mean DMFT score among children in the NTRAI OHP (2019) and all children living in <i>Remote and very remote</i> areas (2012–14).....	21
Figure 3.6: SiC and mean total dmft/DMFT scores of children in the NTRAI OHP, by age, 2019.....	22
Figure 3.7: Changes in average dmft or DMFT score per person-year among children who had at least 2 visits, August 2008 to December 2019.....	24

Related publications

The following AIHW publications might be of interest:

- AIHW 2019. Northern Territory Remote Aboriginal Investment: Oral Health Program July 2012 to December 2017. Cat. no. IHW 205. Canberra: AIHW.
- AIHW 2019. Northern Territory Remote Aboriginal Investment: Oral Health Program July 2012 to December 2016. Cat. no. IHW 190. Canberra: AIHW.
- AIHW 2017. Northern Territory Remote Aboriginal Investment: Oral Health Program July 2012 to December 2015. Cat. no. IHW 175. Canberra: AIHW.
- AIHW 2014. Stronger Futures in the Northern Territory: Oral Health Program July 2012 to December 2013. Cat. no. IHW 144. Canberra: AIHW.
- AIHW 2012. Northern Territory Emergency Response Child Health Check Initiative—follow-up services for oral and ear health: final report, 2007–2012. Cat. no. DEN 223. Canberra: AIHW.
- AIHW 2011. Dental health of Indigenous children in the Northern Territory: findings from the Closing the Gap Program. Cat. no. IHW 41. Canberra: AIHW.

These reports can be downloaded from www.aihw.gov.au/publications. The website also includes information on ordering printed copies.



This report presents information on oral health outreach services provided to Aboriginal and Torres Strait Islander children and young people aged under 16 in the Northern Territory. It shows that in 2019 there were 6,807 full-mouth fluoride varnish services, 1,612 children received fissure sealant applications and 4,780 clinical service visits were provided to 3,552 children. There were some improvements over time in the proportion of Indigenous children in the NTRAI OHP with tooth decay.



Stronger evidence,
better decisions,
improved health and welfare