



Review of Indigenous oral health

Introduction

Oral health is a term used to describe the health of a person's teeth and gums. Good oral health means that a person can eat, speak, and socialise in comfort and not feel embarrassed about their teeth and gums [1]. Poor oral health can cause a lot of pain and affect a person's everyday life [2].

Oral health can also affect a person's general health; if a person has poor oral health it may affect other body systems like the cardiovascular system (heart and circulatory system) [3]. Poor oral health is also associated with diabetes [4], stroke [5], and giving birth to premature and low birthweight babies [6].

Two common diseases that occur in the mouth and affect oral health are caries and periodontal diseases (gum disease).

What is caries?

Caries, also known as cavities or tooth decay, is caused by bacteria that live in the mouth [7]. When a person eats sweet and sticky foods, these bacteria produce acid that decays (breaks down) the tooth's enamel (hard outer part of the tooth). If caries is found early it can be treated and there are no long-term effects. But if caries continues it will cause small holes that can be painful and require a filling. If the small holes are not treated, caries will continue to decay the tooth and cause carious lesions (large holes) that can make the whole tooth weak. If this happens, the tooth may need major treatment or have to be extracted (pulled out). If carious lesions are not treated they can infect the tooth's pulp (soft tissue inside the tooth, including the nerve and blood vessels). This can result in an abscess (swelling) and painful toothaches, and the tooth will probably have to be extracted [8].

Contents

Introduction.....	1
What is caries?.....	1
How is caries measured?.....	2
What are the protective and risk factors for caries and how do they affect Indigenous people?.....	2
What are periodontal diseases?.....	2
What are the protective and risk factors for periodontal diseases and how do they affect Indigenous people?.....	2
How common is caries among Indigenous children?.....	3
How common is caries among Indigenous adults?.....	3
How common are periodontal diseases among Indigenous children?.....	4
How common are periodontal diseases among Indigenous adults?.....	4
What is known about tooth loss?.....	5
What other oral health problems do Indigenous people experience?.....	5
What oral health services are available for Indigenous people?.....	5
Oral health promotion.....	5
Oral health treatment.....	5
What are the barriers to good oral health for Indigenous people?.....	6
References.....	7

CORE FUNDING



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How is caries measured?

Caries is measured by the DMFT index for permanent (adult) teeth and the dmft index for deciduous (baby) teeth [7]. These indices (measurements) are used by dentists to count how many teeth in a person's mouth are decayed (D/d), missing (M/m), and filled (F/f). Unfortunately, this scale only says how many teeth are affected, it cannot tell the difference between a tooth with minor problems and a tooth with major problems. A more detailed measure, the DMFS/dmfs index, counts how many tooth surfaces (sides of the tooth) are decayed (D/d), missing (M/m), and filled (F/f). Counting the number of decayed/missing/filled surfaces of each tooth gives a lot more detail about how a person is affected by caries.

What are the protective and risk factors for caries and how do they affect Indigenous people?

There are a number of factors that make it more likely or less likely that a person will develop caries:

- Diet - caries can mostly be prevented by having a healthy diet [7]. The traditional diet of many Indigenous people included a lot of fibre and protein and was low in sugar. Traditional bush foods generally required a lot chewing which increased the amount saliva (spit) that was produced and helped keep teeth clean [9]. By comparison, the modern diet of many Indigenous people includes a lot of processed and sugary foods that increase the risk of developing caries [7][9].
- Water fluoridation - adding fluoride (a chemical) to drinking water has been proven to be a very good way to prevent caries [10]. The fluoride is added to the water before it leaves the treatment plant, which means it reaches everyone who drinks the water. This is thought to be the most cost-effective way to prevent dental decay for large numbers of people. It is especially effective in areas where many of the people cannot afford to spend a lot of money on dental products or treatment, including Indigenous communities.
- Tooth brushing - tooth brushing with fluoridated toothpaste everyday is essential for good oral health. Evidence suggests that oral care was not necessary with a traditional Indigenous diet, for reasons given above, and was not part of all Indigenous cultures [7]. People who are less well off are less likely to brush their teeth and floss everyday [7][11].
- Visiting the dentist - dental checkups and professional care are important for preventing and treating caries. Visits to the dentists can be expensive and dentists are not always available, especially in rural and remote areas [7]. Most dental offices are not culturally sensitive which can create a barrier for Indigenous people. Many Indigenous people find it difficult to visit a dentist regularly [7][11].

- Hypoplasia - hypoplasia is a condition where the tooth enamel becomes weak. This condition can exist from birth or result from premature birth, infections during childhood [12], not getting enough nutrients [13], and low birthweight [14]. These conditions are more common among Indigenous people than among other Australians [15].

What are periodontal diseases?

Periodontal diseases, also known as gum disease, are infections of the gums and supporting tissues around the tooth [7]. Periodontal diseases are caused by poor oral care (people not brushing and flossing enough) but are preventable and treatable. Periodontal diseases can range from gingivitis (gums that are swollen and bleed when a person brushes their teeth) to severe periodontitis (which destroys all the bone around the tooth). Smoking can make periodontal diseases worse.

What are the protective and risk factors for periodontal diseases and how do they affect Indigenous people?

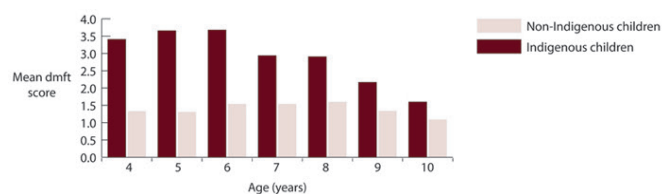
There are a number of factors that make it more likely or less likely for a person to develop periodontal diseases:

- Smoking - smoking is a big risk factor for developing periodontal disease [16]. Smoking reduces the amount of saliva in the mouth and damages the body's immune system so the body is not as good at fighting off infection. Studies have found that smoking is more common among Indigenous people than among non-Indigenous people [17].
- Diabetes - diabetes is associated with infections in the mouth, especially if the diabetes is not properly controlled [7]. Studies have found that diabetes is more common among Indigenous people than among non-Indigenous people [17].
- Tooth brushing - daily tooth brushing is needed to avoid periodontal diseases. Studies have shown that some remote Indigenous communities have low levels of tooth brushing with fluoridated toothpaste [18][19].
- Visiting the dentist - dentists are an important part of good periodontal health. According to the National survey of adult oral health (NSAOH), fewer Indigenous adults than non-Indigenous adults reported visiting a dentist in the 12 months leading up to the survey, and were less likely to visit a dentist every year [11].

How common is caries among Indigenous children?

Indigenous children experience more caries in their deciduous (baby) teeth than do non-Indigenous children [18]. According to the Child dental health survey (CDHS) the average dmft score (how many teeth were decayed/missing/filled) for Indigenous children aged 4 to 10 years was significantly higher than for non-Indigenous children of the same age in NSW, SA, and the NT in 2000-2003 (Figure 1). The scores were highest for Indigenous 6-year-olds who had dmft scores more than two times higher than those of non-Indigenous children.

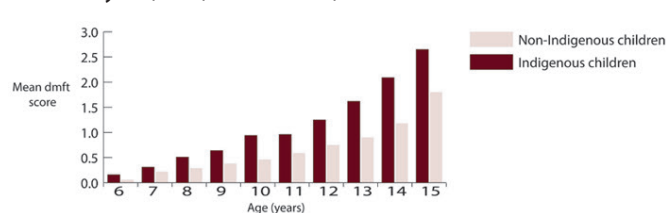
Figure 1. Average number of decayed, missing, and filled deciduous teeth for Indigenous and non-Indigenous children aged 4 to 10 years, NSW, SA and the NT, 2000-2003



Source: Jamieson LM, Armfield JM, Roberts-Thomson KF, 2007 [18]

Indigenous children continued to have more caries when they got their permanent (adult) teeth [18]. The DMFT scores were higher for Indigenous children aged 6-15 years than for non-Indigenous children of the same age in NSW, SA and the NT in 2000-2003 (Figure 2). The scores were highest for Indigenous fifteen-year-olds who had average DMFT scores one-and-a-half times higher than those of non-Indigenous fifteen-year-olds.

Figure 2. Average number of decayed, missing, and filled permanent teeth for Indigenous and non-Indigenous children aged 6 to 15 years, NSW, SA and the NT, 2000-2003



Source: Jamieson LM, Armfield JM, Roberts-Thomson KF, 2007 [18]

Where children live affects their oral health

Caries is more common in rural and remote areas than in major cities [18]. The Study of Aboriginal and Torres Strait Islander child oral health in remote communities found that Indigenous children in rural and remote areas had the worst oral health (highest dmft and DMFT scores) of all Australian children, followed by Indigenous children in cities. Non-Indigenous children in rural/remote areas and living in cities had similar levels of oral health, with dmft/

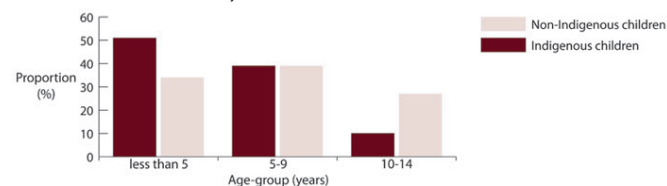
DMFT scores lower than those for Indigenous children in the same locations.

Hospital treatment for dental problems

Sometimes people need to go into the hospital to get dental treatment. The Study of Aboriginal and Torres Strait Islander child oral health in remote communities found that, while rates for hospital care were similar for Indigenous and non-Indigenous children, rates were around one-and-a-half times higher for children living in rural areas than for children living in cities [18]. This may be because there are fewer dental services in rural areas. It is likely that more extractions are necessary in rural areas because more children have teeth that cannot be restored (saved) or because, if their treatment was unsuccessful, it would be too long before they are able see a dentist again.

While hospitalisation rates were similar for Indigenous and non-Indigenous children, the ages that Indigenous and non-Indigenous children went into hospital were quite different [18]. More than one-half of Indigenous children were less than five years old when they went to the hospital for dental treatment, compared with around one-third of non-Indigenous children (Figure 3). Children may need to go to the hospital for dental treatment because they may have a lot of serious caries in their deciduous teeth that will need extraction. In these cases, dentists often use general anaesthesia (put people 'under' or to 'sleep' temporarily) to reduce the distress for the child.

Figure 3. Proportions (%) of Indigenous and non-Indigenous children receiving hospital dental care, by age-group (years), Qld, WA, SA and the NT, 2002-03



Source: Jamieson LM, Armfield JM, Roberts-Thomson KF, 2007 [18]

How common is caries among Indigenous adults?

Caries is much more common for Indigenous adults than for non-Indigenous adults [11]. According to the NSAOH, Indigenous adults had more than two times more untreated caries than did non-Indigenous adults in 2004-2006. This means that more than one-half of the Indigenous adults who were surveyed had untreated caries compared with one-quarter of the non-Indigenous adults. The Aboriginal birth cohort (ABC) study, conducted in the NT in 2006-2007, found that Indigenous adults (aged 17-20 years) had, on average, eight times more decayed teeth than non-Indigenous adults from the NSAOH [20].

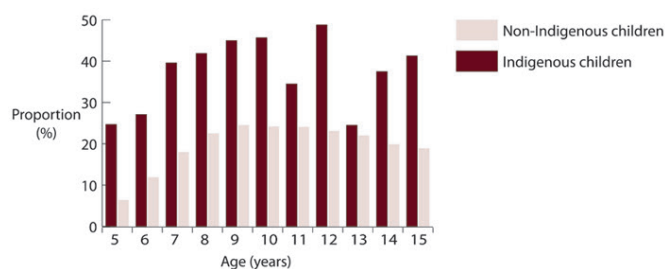
Indigenous adults have more severe caries than non-Indigenous adults [11]. According to the NSAOH, Indigenous adults had more than three times more decayed tooth surfaces than non-Indigenous adults in 2004-2006. The greatest difference was seen among Indigenous people aged 35-54 years who had five times more decayed tooth surfaces than non-Indigenous people of the same age. When comparing the ABC Indigenous adults with the NSAOH non-Indigenous adults, the average number of decayed tooth surfaces was almost 11 times higher for Indigenous adults aged 17-20 years than for non-Indigenous adults of the same age [20].

Indigenous adults have fewer fillings than non-Indigenous adults [20]. Fewer fillings and higher levels of caries suggest that Indigenous people do not use oral health services as much as non-Indigenous people.

How common are periodontal diseases among Indigenous children?

Children do not develop severe periodontal disease often but many children develop gingivitis (a mild periodontal disease). According to the CDHS, gingival bleeding (a common symptom of gingivitis) was more common among Indigenous children than among non-Indigenous children in SA and NSW [18]. In SA in 2003, Indigenous children aged 6 to 15 years had higher levels of gingival bleeding than non-Indigenous children at every age; it was highest for Indigenous twelve-year-olds (Figure 4).

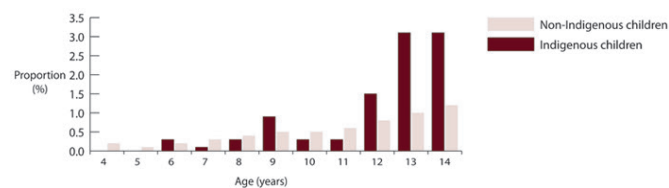
Figure 4. Proportion (%) of Indigenous and non-Indigenous children with gingival bleeding, SA, 2003



Source: Jamieson LM, Armfield JM, Roberts-Thomson KF, 2007 [18]

In NSW in 2000, very few Indigenous and non-Indigenous children aged 4 to 11 years had gingival bleeding, but for children aged 12 to 14 years, almost three times more Indigenous children than non-Indigenous children had gingival bleeding (Figure 5) [18].

Figure 5. Proportion (%) of Indigenous and non-Indigenous children aged 4 to 14 years with gingival bleeding, NSW, 2000

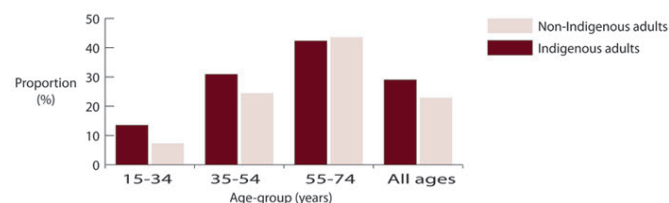


Source: Jamieson LM, Armfield JM, Roberts-Thomson KF, 2007 [18]

How common are periodontal diseases among Indigenous adults?

Indigenous adults are more likely to suffer from periodontal diseases than non-Indigenous adults, especially at younger ages [11]. According to the NSAOH, more than one-in-four Indigenous adults aged 15-75 years had gingival inflammation (swollen gums; a mild periodontal disease), compared with one-in-five non-Indigenous adults. For moderate or severe periodontitis, there were similar proportions of Indigenous and non-Indigenous adults 15-75 years. But, when looking only at younger adults (aged 15-34 years), Indigenous people were twice as likely to have moderate or severe periodontitis as non-Indigenous people (Figure 6).

Figure 6. Proportion (%) of Indigenous and non-Indigenous adults with moderate or severe periodontitis, 2004-2006, Australia

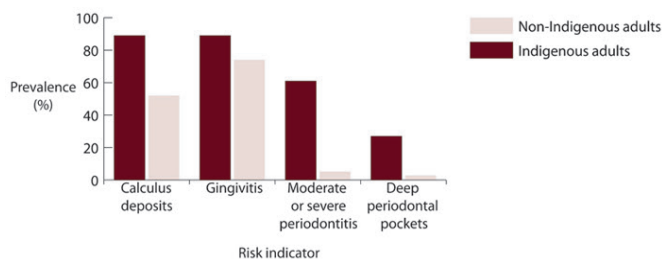


Source: Slade GD, Spencer AJ, Roberts-Thomson, KF, 2007 [11]

Deep periodontal pocket (a gap between the tooth and gum that provides a place for bacteria to live and breed) is an indicator of advanced periodontal disease. While Indigenous and non-Indigenous adults surveyed in the NSAOH had similar levels of deep periodontal pockets at all ages, more young Indigenous adults (aged 15-34 years) were affected than non-Indigenous adults of the same age (18% compared with 13%) [11].

A comparison of the ABC and NSAOH studies found more dramatic differences in periodontal diseases among Indigenous people and non-Indigenous people aged 17-20 years [20][21]. Indigenous people were more likely than non-Indigenous people to have calculus deposits (build up of minerals on the tooth that is a risk indicator for periodontal diseases), gingivitis, moderate or severe periodontal disease, and deep periodontal pockets (Figure 7).

Figure 7. Prevalence (%) of periodontal risk factors for Indigenous and non-Indigenous adults aged 17-20 years, Australia, 2004-2007



Source: Jamieson LM, 2010 [20], Jamieson LM, Sayers SM, Roberts-Thomson KF, 2010 [21]

Note: Prevalence is the percentage of people with the condition.

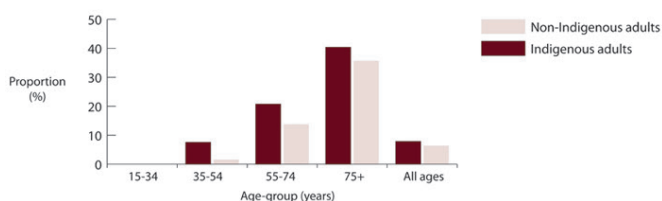
What is known about tooth loss?

The two main reasons why people lose teeth are:

- extraction of diseased teeth because of caries or periodontal diseases
- injury (for example, losing a tooth from an assault).

Complete tooth loss (when a person loses all their teeth) can be caused by poor oral hygiene or by treatment that relies on extractions rather than saving teeth. In Australia, older people are much more likely to have complete tooth loss than young people [11]. In 2004-2006, Indigenous adults aged 35-54 years were five times more likely to have lost all of their teeth than non-Indigenous adults of the same age (Figure 8). The proportions were similar for Indigenous and non-Indigenous adults 75 years and older.

Figure 8. Proportion (%) of Indigenous and non-Indigenous adults with complete tooth loss, 2004-2006, Australia



Source: Slade GD, Spencer AJ, Roberts-Thomson, KF, 2007 [11]

What other oral health problems do Indigenous people experience?

Some oral health problems are not as easy to identify as caries and periodontal diseases. The NSAOH found that [11]:

- Indigenous adults were almost twice as likely as non-Indigenous adults to have had a toothache in the year before the survey was conducted.

- Indigenous adults were twice as likely as non-Indigenous adults to report avoiding food because of oral health problems. Oral health problems can cause people to avoid certain kinds of food that might be difficult to eat (for example, someone who has lost most of their teeth may not be able to eat steak); this can reduce a person's enjoyment of food and may also make it difficult for them to have a balanced diet.
- Indigenous adults were one-and-a-half times more likely than non-Indigenous adults to rate their oral health as 'fair' or 'poor' (the two lowest measures).

What oral health services are available for Indigenous people?

There are two main kinds of oral health services: health promotion services and oral health treatment.

Oral health promotion

Health promotion services are designed to give people information about how to prevent, manage, or treat health problems. There are some organisations in Australia that have developed oral health promotion resources and programs for Indigenous people. Some of these organisations are part of the government, like the Queensland Department of Health Oral Health Unit. Examples of oral health promotion resources that have been specially developed for Indigenous people include:

- the Crocodile smiles program, developed by Queensland Department of Health Oral Health Unit
- The tooth book, developed by the Western Australian Department of Health' Dental Health Education Unit.

Oral health treatment

There are three main types of oral health treatment services available to Indigenous people in Australia:

- Private oral health - visiting a private dentist is the most common way for people to get oral health treatment. Unfortunately, private dentists can be expensive for people who have to pay the full cost or pay the 'gap' from their insurance company.
- Some patients may be eligible to get funded treatment through the following schemes:
 - Medicare
 - Chronic disease dental scheme - available to adults with a chronic disease that affects their oral health. The patient must have a referral from a general practitioner to be eligible (up to a maximum cost of \$4250 over two years).

- Teen dental plan - yearly dental checks for teens (12-17 years) to a maximum cost of \$157 per year.
- Child health checks - free dental checks available to children up to 15 years of age.
- Public oral health - oral health services do not receive much government funding. Types of oral health treatment services provided by government (other than those available through Medicare) include:
 - State-funded dental treatment - available to adults with a Centrelink concession card. Waiting times can be long and patients in some states and territories may have to cover some of the costs. Most treatment is limited to emergency treatment to reduce pain.
 - School dental service - available to children in primary and secondary school. There is evidence that this scheme may be under-used by Indigenous children in some communities for reasons like: the dentists are only in the communities for a short time; children more likely to miss school and therefore miss out on the school dental services; families move around from one community to another and miss out; people may not be aware of the importance of the checks [19]. Some school dental services require parents to pay some of the cost of the treatment.
- Aboriginal community controlled health services - some Aboriginal community controlled health services (ACCHSs) offer oral health treatment as part of their health services. ACCHSs are run by the communities and provide medical care that is culturally appropriate.
- Long distances to oral health services - people living in remote or very remote parts of Australia need to travel long distances to visit a dentist [23]. About one-in-four Indigenous people live in remote or very remote areas.
- Limited access to fresh foods - fresh foods can help keep teeth healthy. Indigenous people in remote or very remote areas may only be able to buy or afford processed foods high in sugar that can lead to caries.
- Limited access to fluoridated water - fluoridated water can help to reduce caries. Most Indigenous people living in remote areas do not have access to fluoridated water [10].
- Overcrowded living conditions - overcrowded living conditions can affect oral health (for example, people are less likely brush their teeth if they think someone else may have used their toothbrush at home or at school) [24]. Surveys have found that around one-in-four Indigenous people live in overcrowded houses [25].
- Less daily brushing and flossing - there is evidence that brushing was not part of traditional life for many Indigenous people [7][22] and it is likely that there is still a lack of understanding about the benefits of brushing and flossing. Indigenous people in some communities do not brush with fluoridated toothpaste as often as is recommended [19].
- Expense of dental treatment - studies have found that oral health services are often too expensive for some Indigenous people [11].

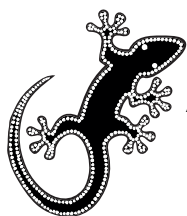
What are the barriers to good oral health for Indigenous people?

Indigenous people experience many barriers to good oral health including:

- Few culturally appropriate services - most oral health services are not culturally appropriate for Indigenous people (staff do not get cultural awareness training and there are no Indigenous health workers on staff) [22].
- Few Indigenous people work in oral health services - it is likely that Indigenous people feel more comfortable visiting an Indigenous oral health professional than a non-Indigenous one [22], however, there are not very many Indigenous people working as oral health professionals (dentists, hygienists, nurses, etc).

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Australian Indigenous HealthInfoNet

The Australian Indigenous HealthInfoNet is an innovative Internet resource that contributes to 'closing the gap' in health between Indigenous and other Australians by informing practice and policy in Indigenous health.

Two concepts underpin the HealthInfoNet's work. The first is evidence-informed decision-making, whereby practitioners and policy-makers have access to the best available research and other information. This concept is linked with that of translational research (TR), which involves making research and other information available in a form that has immediate, practical utility. Implementation of these two concepts involves synthesis, exchange and ethical application of knowledge through ongoing interaction with key stakeholders.

The HealthInfoNet's work in TR at a population-health level, in which it is at the forefront internationally, addresses the knowledge needs of a wide range of potential users, including policy-makers, health service providers, program managers, clinicians, Indigenous health workers, and other health professionals. The HealthInfoNet also provides easy-to-read and summarised material for students and the general community.

The HealthInfoNet encourages and supports information-sharing among practitioners, policy-makers and others working to improve Indigenous health – its free on line yarning places enable people across the country to share information, knowledge and experience. The HealthInfoNet is funded mainly by the Australian Department of Health and Ageing. Its award-winning web resource (www.healthinonet.ecu.edu.au) is free and available to everyone.

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