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Ear and hearing health of Aboriginal and Torres Strait Islander people 2021



Ear and hearing
health of Aboriginal
and Torres Strait
Islander people
2021



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Summary

This is the inaugural Australian Institute of Health and Welfare (AIHW) national report on the ear and hearing health of Aboriginal and Torres Strait Islander children and adults.

Indigenous Australians experience excessive rates of ear and hearing problems which can have profound impacts on overall health and quality of life. These problems may limit opportunities for education, work, personal relationships and wider community engagement. Problems affecting children can have ongoing impacts, affecting speech, language, cognitive and behavioural development. Importantly, ear and hearing problems affect the passing of Indigenous cultural knowledge and immersion in culture. Much ear disease and hearing loss affecting Indigenous Australians, particularly children and younger adults, is preventable.

This report brings together information on the prevalence of ear and hearing problems among Indigenous Australians along with insights on key protective and risk factors. It presents information on accessibility and use of ear and hearing health-care services by Indigenous Australians, from screening to treatment to rehabilitation and includes on-the-ground experiences of Indigenous-specific primary health-care service providers. The report identifies key data gaps and potential areas for data development.

Prevalence

- In 2018–19, a national voluntary hearing test was conducted as part of the Australian Bureau of Statistics' (ABS) National Aboriginal and Torres Strait Islander Health Survey (NATSIHS). Based on this test among Indigenous Australians, an estimated:
 - 43% aged 7 and over (290,400 people) had hearing loss in one or both ears
 - 29% of children aged 7–14 had hearing loss in one or both ears, increasing to 40% in *Remote* and *very remote* areas
 - 82% of adults aged 55 and over had hearing loss in one or both ears
 - 79% aged 7 and over with measured hearing loss did not report having it long term.
- The age-standardised rate of burden of living with ear and hearing-related conditions (years lived with disability per 1,000 population) among Indigenous Australians was 3.6 times that for non-Indigenous Australians.
- Prevalence data are a key gap identified in this report. Comprehensive information is needed on how many people have ear and hearing conditions and the type of conditions. It is noted that:
 - no national data source exists on:
 - causes of hearing loss among Indigenous Australians
 - the prevalence of otitis media and other ear disease
 - measured hearing loss among Indigenous children aged 0–6, with poor ear and hearing health a serious problem among this group
 - hearing loss among Indigenous Australians in contact with the criminal justice system
 - repeated measurement of ear and hearing health of Indigenous Australians of all ages in national health surveys is needed.

Protective and risk factors

- Protective factors for ear and hearing health during pregnancy, birth and childhood include antenatal care, avoiding smoke exposure, vaccination, breastfeeding support, good hygiene and adequate housing. Risk factors include birth complications, low birthweight or premature birth, hereditary and non-hereditary genetic factors.
- Protective factors across all ages include managing repeated or chronic ear infections and other chronic conditions, limiting repeated exposure to loud noise, and reducing smoking rates. Risk factors include ageing, injury or trauma to the ear or head, use of ototoxic medications and exposure to ototoxic chemicals and workplace noise.
- Public awareness helps prevent ear disease and hearing loss by raising knowledge on signs and symptoms, treatment and services.
- Access to health care may be impacted by accessibility and availability of culturally appropriate health services, complexity of the health system and continuity of care.
- More evidence is needed on protective and preventive measures related to ear disease and hearing loss among Indigenous Australians and their impact.

Screening and diagnosis

- In 2019–20, between 94% and 99% of eligible (medically suitable) Indigenous babies completed neonatal hearing screening under state and territory programs in Queensland, Western Australia (public maternity hospitals), South Australia and the Northern Territory's Top End Health Service. While all states and territories have universal hearing screening programs for Indigenous babies, these programs had data accessible for reporting in 2019–20. A national data set for neonatal hearing screening, including pathways to diagnosis and treatment, is needed and efforts towards this goal are ongoing.
- Between 2010–11 and 2020–21, the proportion of Indigenous Australians who had an Indigenous specific health check increased from 10% to 27%. An ear and hearing test is a requirement of the check for those aged under 55 and recommended for those aged over 55. However, reliable information is not available on how many Indigenous Australians had a test during their health check or on results of the check. While there is currently no other source of information on ear and hearing checks, development has been agreed for a new national key performance indicator. This indicator will provide information on Indigenous children aged 0–14 who received an ear health check through Government-funded Aboriginal Medical Services.
- In 2019–20, 7,400 (8.7 per 1,000 population) Indigenous Australians of all ages received Medical Benefits Schedule (MBS) subsidised audiology services (13,900 audiology services provided in total). Audiology service rates were highest among Indigenous children aged 0–14 (4,600 children, 16 per 1,000 population). However, rates for Indigenous children aged 0–14 were lower than for non-Indigenous children aged 0–14 (a difference of 2.9 per 1,000 population). The largest difference in rates between Indigenous and non-Indigenous Australians was for those aged 65 and over (difference of 4.5 per 1,000 population).

- In 2018–20, 18,100 emergency department presentations were made by Indigenous Australians for ear or hearing-related problems (11 per 1,000 population). Over half (52%) were by Indigenous children aged 0–14. The age-standardised rate of ear or hearing-related emergency department presentations was more than twice the rate among Indigenous Australians than non-Indigenous Australians.
- Improved primary health-care data are essential to understanding the role and use of primary health care in screening, diagnosing, treating and managing ear disease and hearing loss among Indigenous Australians. Several initiatives are underway to help bridge this gap.

Treatment and rehabilitation

- Between July 2018 and June 2020:
 - almost 7,000 hospitalisations took place for Indigenous Australians for ear or hearing problems (4.1 per 1,000 population)
 - the rate of ear or hearing-related hospitalisations among Indigenous Australians was 1.4 times the rate among Indigenous Australians than non-Indigenous Australians (after adjusting for age differences between the 2 populations).
 - ear or hearing-related hospitalisation rates were highest among Indigenous children aged 0–14 living in *Remote* and *Very remote* areas (11 and 13 per 1,000 population respectively)
 - 5,000 additional hospitalisations among Indigenous Australians had a diagnosis of coexisting ear or hearing-related problems. While not the main (principal) condition responsible for hospitalisation, it affected patient care. For Indigenous children aged 0–14, the hospitalisation rate with ear or hearing-related problems as a principal diagnosis or coexisting condition was 13 per 1,000 population.
 - Indigenous Australians had 8,500 ear or hearing-related procedures in hospital (5.0 per 1,000 population), the most common was myringotomy (4,500 procedures, 2.7 per 1,000 population)
 - 1,600 Indigenous Australian patients were admitted for elective myringotomy surgery from public hospital waiting lists, with half of these patients waiting at least 75 days for admission. In comparison, half of the non-Indigenous Australians myringotomy patients waited 62 days to be admitted.
- As at 31 December 2019, 6,949 Indigenous Australians fitted with a hearing aid or cochlear implant were provided services as clients of Hearing Australia (8.1 per 1,000 population).
 - Indigenous Australians made up 3.5% of all aided and implanted clients
 - 115 Indigenous Australian clients had at least one cochlear implant, 6,892 had at least one hearing aid (58 had both a cochlear implant and hearing aid).
- Between 2008 and 2019, among Indigenous children and young people aged 0–25 who were Hearing Australia clients fitted with a hearing aid or cochlear implant, the peak age of first fitting decreased from 8–9 years to 4–6 years of age.
- As of 30 June 2020, 1,700 Indigenous Australians were active participants in the National Disability Insurance Scheme (NDIS) and reported hearing impairment as a disability (5.3% of the 32,400 Indigenous Australian participants). Almost 2 in 3 Indigenous Australian NDIS participants with hearing impairment lived in Victoria (32%) or New South Wales (31%).

- Some data gaps were identified in preparing this report, including the need for data on:
 - fitting and use of hearing devices and related services beyond those provided by Hearing Australia under the Hearing Services Program (HSP)
 - the use of rehabilitation services such as speech pathology or occupational therapy for ear or hearing-related problems
 - referral pathways and waiting times for audiologists, Ear Nose and Throat (ENT) specialists and allied health services.

Workforce

- In 2016, 1,885 people reported their occupation as an audiologist, a rate of 7.8 per 100,000 population. Almost 4 in 5 (78%) lived in Major cities and less than 5 identified as Indigenous Australians.
- In 2019, 475 ENT specialist surgeons were employed in Australia (2.1 full time equivalent per 100,000 population). Over 4 in 5 ENT specialists were based in Major cities as their principal place of practice.
- Between 2013–14 and 2019–20, the proportion of Indigenous-specific primary health-care organisations with an employed or visiting audiologist or audiometrist doubled, from 28% to 58%. The proportion with an ENT specialist increased 2.7 times, from 12% to 32%.
- Detailed information is required on the ear and hearing health workforce, including on the:
 - location of services, employment of Indigenous staff and training undertaken
 - training pathways for Indigenous Australians entering the ear and hearing health workforce
 - cultural safety of ear and hearing health-care provided to Indigenous Australians and data on the current workforce providing culturally appropriate services
 - ENT specialists and audiologists participating in outreach activities.

Aboriginal and Torres Strait Islander children

- In 2018–19, 40% of Indigenous children aged 7–14 in *Remote* and *very remote* areas had measured hearing loss in one or both ears, compared with 23% in *Major cities*.
- In 2019–20, over one in 4 (73,000 or 26%) Indigenous children aged 0–14 were reported as having had a basic ear check, including otoscopy, as part of an Indigenous-specific health check. An ear and hearing test is a requirement of this health check for Indigenous children aged 0–14. However, reliable information is not available on how many Indigenous Australians had the test during their health check or on results of the check.
- Between July 2018 and June 2020, over 4,500 hospitalisations (8.1 per 1,000 population) took place for Indigenous children aged 0–14 for ear or hearing-related problems:
 - 2,300 hospitalisations were for Indigenous children aged 0–4 (12 per 1,000 population)
 - the rate of ear or hearing-related hospitalisations was 1.4 times the rate among Indigenous children aged 0–14 than non-Indigenous children aged 0–14. The rate ratio increased with age – from 1.1 for children aged 0–4 to 2.5 for those aged 10–14.

- From July 2018 to June 2020, Indigenous children aged 0–14 had higher rates of middle ear-related surgical procedures than non-Indigenous children (rates of 7.1 and 5.9 per 1,000 population respectively).
- Between 2008 and 2019, 3,300 Indigenous children aged 0–14 were fitted with a hearing aid or cochlear implant and received audiological or hearing support services from Hearing Australia.
- Given the high rates of ear disease and long-term developmental impacts of even short-term ear or hearing problems in children, a national approach to measuring and reporting on Indigenous children’s ear and hearing health is required. More information is also needed on outcomes for those with ear or hearing problems. Data issues to address among Indigenous children include:
 - the prevalence of ear and hearing conditions, particularly for otitis media and associated hearing loss, which is not known
 - data on measured hearing loss are not available for children aged under 7
 - information on diagnosis, treatment and patient pathways is limited.



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Introduction

1 Introduction

Following a key recommendation from the 2017 Report on the Inquiry into the Hearing Health and Wellbeing of Australia, by the House of Representatives Standing Committee on Health, Aged Care and Sport, this inaugural report provides a national framework for reporting on ear and hearing health problems across the continuum of care, among Aboriginal and Torres Strait Islander people. It provides insights on prevalence, common protective and risk factors, and accessibility and use of ear and hearing health-care services from screening to treatment to rehabilitation. It also identifies key data gaps and potential areas for data development.

Indigenous Australians experience excessive rates of ear and hearing problems. In 2018–19, more than 2 in 5 (43%) Indigenous Australians aged 7 and over presented with hearing loss (ABS 2019c, Chapter 2). Moreover, it is estimated that Indigenous Australians lost an estimated 5,200 years of healthy life due to living with hearing loss and ear disease in 2018, or 6.3 years of healthy life lost for every 1,000 Indigenous Australians (AIHW Australian Burden of Disease Study, unpublished).

Indigenous children also experience some of the highest rates of ear disease and associated hearing loss in the world (WHO 2004). The main ear condition affecting Indigenous children is otitis media, the inflammation and/or infection of the middle ear (Burns & Thomson 2013). This common childhood illness, often accompanying a cold or flu, is largely preventable and treatable. However, chronic or recurrent otitis media can cause persistent and potentially permanent hearing loss. Indigenous children are more likely than non-Indigenous children to experience long-term effects of otitis media, as they tend to develop ear disease at a younger age, and experience greater frequency and severity of infections (Jervis-Bardy et al. 2014). In 2018–19, Indigenous children aged 0–14 were more than twice as likely as non-Indigenous children to report an ear or hearing problem (6.9% compared with 3%) (ABS 2019c).

Ear and hearing problems in children can have ongoing impacts, affecting language, speech and language development (Menzies School of Health Research, 2020). Impacts may also affect the development of a wide range of skills children need to engage well at school. This can, in turn, lead to long-term developmental and behavioural problems, social isolation, lower school attendance, early school leaving and poorer educational outcomes (Burns & Thomson 2013; Leach et al. 2021; Su et al. 2020a; Su et al. 2019; Su et al. 2020b).

For adults, ear disease and hearing loss may limit employment opportunities, contribute to strained relationships and increase isolation from community and culture. It is associated with increased contact with the criminal justice system and with cognitive decline in older adults (Australian Indigenous HealthInfoNet 2021; Burns & Thomson 2013; Gotis-Graham et al. 2020).

The significant developmental, social and cultural impacts of ear and hearing problems were highlighted in feedback from the Aboriginal and Community Controlled Health Organisations (ACCHO) sector (Box 1.1).

Box 1.1 Feedback from the Aboriginal Community Controlled Health Organisations (ACCHO) sector

'Hearing loss in childhood can impair the development of verbal and written communication skills which can have a life-long detrimental impact on social skills, learning and behavioural development.'

'Hearing loss has a significant impact on the daily life of Indigenous people, including becoming less sociable, and reduced capacity to communicate with health services and community services in general.'

'The joy of a very oral culture is muted if someone feels shamed or excluded by their poor hearing. Hearing loss is a very socially isolating condition.'

More information: see Appendix B.

Much ear disease and hearing loss affecting Indigenous Australians, particularly children and younger adults, is preventable. Poor ear and hearing health is associated with the social determinants of health. These determinants include household overcrowding, access to hygiene and sanitation facilities, second-hand smoke exposure, occupational noise exposure, malnutrition and chronic conditions, and lack of access to medical services (Burns & Thomson 2013; Kong & Coates 2009).

There is some evidence of improvement. Coates and Kong (2020) observed, for example, that:

The last 10 years have seen steady improvement in Aboriginal and Torres Strait Islander ... ear and hearing health, with many new initiatives by government, Aboriginal Medical Services (AMS), non-government organisations (NGOs), specialist medical and paramedical groups and researchers.

1.1 Main ear and hearing conditions

The main causes of ear and hearing problems change across the life course (Figure 1.1). The main ear condition affecting Indigenous children is otitis media. Other forms of ear and hearing problems in Indigenous children include congenital hearing loss (present at birth), noise-related hearing loss, and loss caused by other infections and the use of ototoxic medications (see Glossary).

Figure 1.1 Causes of hearing loss over the life span

| Prenatal | Perinatal | Childhood and adolescence | Adulthood and older age |
|--|---|---|--|
| <ul style="list-style-type: none"> • Genetic factors • <i>Intrauterine infections (for example, rubella and cytomegalovirus)</i> | <ul style="list-style-type: none"> • <i>Early onset otitis media</i> • <i>Birth complications</i> • <i>Birth asphyxia</i> • <i>Neonatal jaundice</i> • <i>Low-birth weight</i> | <ul style="list-style-type: none"> • <i>Chronic otitis media</i> • <i>Meningitis and other infections</i> | <ul style="list-style-type: none"> • <i>Chronic diseases</i> • <i>Smoking</i> • <i>Otosclerosis</i> • <i>Age-related</i> • <i>Sudden hearing loss</i> |
| <p style="text-align: center;">Any age</p> | | | |

Trauma to the ear or head, loud noise, ototoxic medicines, ototoxic chemicals, nutritional deficiencies, viral infections and other ear conditions, impacted ear wax, delayed onset or progressive genetic hearing loss

Notes: Causes shown in italics are considered preventable.

Chart: AIHW Source: Smith 2019; WHO 2016, 2021.

Compared with children, adults are less likely to be affected by ear infections but are more likely to experience sensorineural hearing loss (Box 1.2), particularly at older ages. Hearing loss in adults may result from factors including ageing, exposure to loud noise, genetic causes, infectious and chronic diseases, use of ototoxic medicines, and injuries and accidents. Indigenous adults can also experience ongoing ear and hearing problems because of otitis media in childhood. Apart from hearing loss caused by genetic conditions and ageing, much hearing loss experienced by Indigenous adults is likely preventable.

Box 1.2 Understanding ear and hearing problems

Ear health refers to the healthy function of the ear. A wide range of conditions affect the ear such as infectious diseases, ear infections (including otitis media), injuries to the ear, balance disorders, tinnitus, hyperacusis and hearing loss.

Hearing loss refers to loss of hearing in one or both ears which may result from genetic causes, complications at birth, infectious diseases, chronic ear infections, use of certain medicines, injuries and accidents, exposure to loud noise and ageing.

While ear disease and other ear conditions can cause hearing loss, not all hearing loss is caused by ear conditions. Similarly, not all ear conditions cause hearing loss.

Hearing loss can be present at birth (congenital) or occur later in childhood or adulthood (acquired). The 3 types of hearing loss are:

- **sensorineural** – hearing loss that occurs when there is damage to the inner ear. Damage can be due to noise, chemicals from smoking, chemical agents or medications, and from ageing. Sensorineural hearing loss is permanent and cannot be rectified surgically or medically.
- **conductive** – hearing loss that occurs when sounds cannot get through the outer and middle ear. Causes can include otitis media, impacted wax in the ear or a ruptured ear drum. Conductive hearing loss can be temporary or permanent but can usually be rectified through surgery or medications.
- **mixed** – hearing loss that has elements of both sensorineural and conductive hearing loss. This means the outer ear cannot conduct sound properly to the inner ear and the inner ear cannot process sounds to be sent to the brain.

The impact of hearing loss varies widely. Some factors include: severity of the hearing loss (Section 2.3); whether it affects one ear (unilateral) or both ears (bilateral); age of onset of hearing loss; type of hearing loss; and access to services.

Otitis media refers to the inflammation and infection of the middle ear. It is the main cause of hearing loss in Indigenous children. Otitis media is a common childhood illness, often accompanying a cold or flu, and can be resolved without intervention. However, recurrent or chronic otitis media is more serious and can cause temporary or permanent hearing loss. Medical (antibiotics) or surgical intervention can be required to effectively manage chronic otitis media. The main forms of this disease include:

- **acute otitis media** (also known as a bulging eardrum), which refers to fluid behind the eardrum plus at least one of: bulging or red eardrum, recent discharge of pus, fever, ear pain or irritability
- **otitis media with effusion** (sometimes referred to as glue ear), which involves the presence of fluid behind the eardrum without acute symptoms
- **chronic suppurative otitis media with discharge** (sometimes referred to as runny ears), which refers to persistent ear discharge through a persistent perforation (hole) in the eardrum lasting for more than 2 weeks
- **chronic suppurative otitis media without discharge**, which refers to a hole in the eardrum without evidence of discharge or fluid behind the ear (Leach et al. 2020).

1.2 Factors influencing ear and hearing health

Protective and risk factors contributing to poor ear and hearing health among Indigenous Australians are complex. Social and cultural factors include historical, cultural and socioeconomic forces such as dispossession, powerlessness and lack of self-determination. Other factors relate to public awareness of conditions and treatment, determinants of ear and hearing health and access to health care. (Burns & Thomson 2013; DeLacy et al. 2020; Jervis-Bardy et al. 2014; Leach et al. 2020; Leach et al. 2021; NACCHO & RACGP 2018). Racism and unconscious bias in the healthcare system creates barriers to accessing healthcare and may result in a failure to refer patients to ENT specialists.

Protective and risk factors influencing ear and hearing health are explored in Chapter 3.

1.3 The ear and hearing health system

1.3.1 Ear and hearing health services

Ear and hearing health services are provided across a continuum of care from awareness, screening, diagnosis, treatment and rehabilitation. A broad overview of these services is provided in this section and summarised in Table 1.1.

Providers

Ear and hearing health-care services are provided by health-care providers. This includes Aboriginal and Torres Strait Islander health workers and health practitioners, General Practitioners (GPs), ENT specialists, audiologists, other allied health workers and nurses. Ear Health Coordinators work with communities and health-care providers to build skills and knowledge that helps prevent and treat ear disease and hearing loss and identify pathways to ear and hearing health services. Professionals not traditionally considered part of the health-care system – such as teachers, early childhood education and care professionals, teachers of the deaf and support workers – are also essential for delivering of ear and hearing services. They help prevent and identify ear and hearing problems and provide support and rehabilitation for people with these issues.

Services

Identifying and diagnosing ear disease or hearing loss can involve various screening and diagnosis tests. Once diagnosed, appropriate management varies based on cause. Ear disease and conductive hearing loss can usually be treated through medical and surgical interventions. Antibiotics treat chronic or recurrent ear infections. Procedures include cleaning ears and removing wax build ups, making incisions in the eardrum to remove fluid, inserting drainage tubes (called grommets), and repairing damage to the eardrum (Box 5.2).

Sensorineural hearing loss and other hearing problems such as tinnitus cannot usually be treated or reversed, but their impact can be mitigated through rehabilitation services. Rehabilitation refers to technologies, services and interventions designed to reduce the impact of ear disease and hearing loss on communication, educational outcomes, social activities, work and community participation, and quality of life. This includes providing hearing aids or cochlear implants, speech and/or occupational therapy, counselling, teaching and/or school assistance. Rehabilitation services can also mitigate the impact of conductive or temporary hearing loss.

Settings

Ear disease and hearing loss services are provided in different health-care settings. Most people enter the ear and hearing health system by attending primary health-care services delivered in settings such as general practices, community health centres and allied health practices. Patients may present for an ear or hearing problem or have a problem identified through a routine ear or hearing check. Treatment may also be provided by primary health-care services and referrals can be made to audiologists and ENT specialists.

People may also enter the ear and hearing health system in other ways. This includes attending ear or hearing screening programs, presenting at a hospital emergency department for an ear condition, or making an appointment directly with an audiology clinic or hearing aid provider.

Table 1.1: Overview of ear and hearing health services

| Screening | Diagnosis | Treatment | Rehabilitation |
|---|---|---|---|
| Services | Services | Services | Services |
| Ear examinations Hearing assessments | Ear examinations Hearing assessments Balance assessments Other scans, biopsies, cultures or tests | Antibiotics and other medical treatments Ear surgery (for example, myringotomy and myringoplasty) Wax removal and ear cleaning | Hearing aids, cochlear implants Assistive listening devices Communication training Vestibular (balance) rehabilitation Counselling Education and support services Speech therapy Occupational therapy |
| Providers | Providers | Providers | Providers |
| Aboriginal Health Workers GPs Nurses Audiologists Audiometrists Ear Health Coordinators | Aboriginal Health Workers GPs Nurses Audiologists Audiometrists ENT specialists | GPs Nurses Audiologists ENT specialists | Audiologists Audiometrists ENT specialists Teachers and other educators Support workers Speech pathologists Occupational therapists |
| Settings | Settings | Settings | Settings |
| Indigenous-specific primary health-care services including Aboriginal Community Controlled Health Services Community clinics and health centres Private practices and clinics Hospitals Schools and early childhood education and care services | Indigenous-specific primary health-care services including Aboriginal Community Controlled Health Services Community clinics and health centres Private practices and clinics Hospitals Outreach services | Indigenous-specific primary health-care services including Aboriginal Community Controlled Health Services Community clinics and health centres Private practices and clinics Hospitals Outreach services | Indigenous-specific primary health-care services including Aboriginal Community Controlled Health Services Community clinics and health centres Private practices and clinics Hospital outpatient clinics Outreach services in various settings |
| Access | Access | Access | Access |
| No referral required | Referral required for subsidised audiology and ENT services | Antibiotics can be provided by GPs or ENTs Surgery requires referral to ENT specialists | Referral required to access subsidised supports |

1.3.2 Ear and hearing health policy context, services and programs

Ear and hearing health services for Indigenous Australians are supported by a broad range of policies and programs (Figure 1.2). Responsibility for services in Australia is shared across levels of government, with the Australian and state and territory governments broadly sharing responsibility for funding, operating and managing the health system. The private for-profit and the non-profit sectors also play a key role in operating private hospitals, medical practices, audiology services and rehabilitation services.

Roadmap for Hearing Health

To spearhead a coordinated effort to improve hearing health and the lives of the millions of Australians affected by hearing loss, the Australian Government established a Hearing Health Sector Committee in July 2018 to develop the first Roadmap for Hearing Health (2019). The roadmap was reviewed by the Council of Australian Governments (COAG) Health Council in March 2019.

The roadmap highlights 8 key priorities and 147 actions, which highlight the broad range of initiatives that governments and the hearing sector can work on together. Among these priorities and actions are many recommendations that aim to improve ear and hearing health for Indigenous Australians. These include:

- a public awareness campaign to raise awareness of hearing health and help prevent hearing loss, aimed at Indigenous communities, the broader community, health professionals, and early childcare and primary school workers
- child ear health checks for children aged 0–6 where every child, particularly those in Indigenous communities, has regular ear health checks, the results of which are recorded in a national database with the objective of no child ‘slipping through the cracks’
- an audit of the workforce delivering hearing health services, to identify gaps and inform future workforce planning
- education system supports, including information to remove the stigma around hearing loss and support for students such as soundfield amplification and other individual supports
- more support for people on low incomes.

National Agreement on Closing the Gap

The National Agreement on Closing the Gap has 17 targets across areas that impact outcomes for Indigenous Australians across the life-course. Ear and hearing health is linked to targets across health, education and employment. One target, closely related to ear and hearing health, is to ensure that ‘Children thrive in their early years’ (Joint Council on Closing the Gap 2020). This target aims to increase the proportion of Indigenous children assessed as developmentally on track across the Australian Early Development Census domains of physical health and wellbeing, social competence, emotional maturity, language and cognitive skills and communication skills, and general knowledge. Research indicates that hearing problems as a young child especially impact development of language and cognitive skills, communication skills and general knowledge, and physical health and wellbeing. This increases the risk of being developmentally vulnerable in 2 or more of the Australian Early Development Census domains (Su et al. 2020b).

Initiatives for ear and hearing health

The Australian Government funds initiatives, policies and guidance to prevent and treat ear disease and hearing loss, including Indigenous-specific programs and national programs that subsidise ear or hearing-related health-care (Figure 1.2).

States and territories provide essential ear and hearing-related services through public hospitals, neonatal hearing screening programs for newborn babies, other targeted hearing screening programs, audiology services aimed at diagnosing hearing loss in young children and outreach services. Data from a selection of these programs has been included in this report.

Figure 1.2: Indigenous ear or hearing-related services, policies and programs in Australia



Notes:

1. This figure presents a selection of current Indigenous ear or hearing-related services, policies and programs in Australia, it is not a comprehensive overview of all services, policies, programs and organisations providing services.
2. PBS = Pharmaceutical Benefits Scheme; NDIS = National Disability Insurance Scheme; PLUM = Parents evaluated listening and understanding measure; HATS = Hear and talk scale; HAP-EE = Hearing Assessment Program – Early Ears; ACCHO = Aboriginal Community Controlled Health Organisation.
3. ^ In addition to the Indigenous Australian Health Program, ACCHOs may access other funding sources to support service delivery.
4. *Earbus Foundation is a non-profit sector organisation which accesses Government and other funding sources to support service delivery.

Source: This figure was developed by AIHW with input from the Australian Government Department of Health.

A number of programs have been established nationally, by states and territories, and non-profit organisations to address the high rates of ear disease and hearing problems among Indigenous Australians and overcome barriers to service use. Most target middle ear disease and conductive hearing loss among children.

National Indigenous-specific programs and strategies include:

- Healthy Ears – Better Hearing, Better Listening – an outreach diagnosis and treatment program for Indigenous children and youth from birth to age 21
- Hearing Assessment Program – Early Ears (HAPEE) – provides audiology assessments for Indigenous children aged 0–6 and supports health services to provide ear health care (Section 7.2.2)
- Ear Surgical Support – expedites access to ear surgery for Indigenous children by paying travel expenses for patients and carers to attend surgery, or for surgeons to travel to a patient’s location
- Ear Equipment – provides and maintains free ear and hearing assessment equipment to Aboriginal Medical Services
- Ear Health Assessment Training – trains health professionals on recognising and treating ear and hearing health issues in Indigenous Australians
- Care for Kids’ Ears – provides ear and hearing health awareness and education resources to support parents, carers and teachers to prevent ear health issues
- Aboriginal and Torres Strait Islander Ear and Hearing Health Partnership Committee, co-chaired by the Australian Government Department of Health and NACCHO, and consists of members from Hearing Australia, ACCHOs, and experts in the ear and hearing fields.

Other national programs subsidising ear or hearing-related health care include:

- Hearing Services Program (HSP) – provides subsidised assessment for hearing impairment and rehabilitation services, including hearing aid fitting, to eligible Australians (Section 5.2)
- Medicare – supports the provision of ENT services and some clinical audiology and audiometry services (Section 4.3)
- National Disability Insurance Scheme (NDIS) – funds additional supports such as early childhood intervention or assistive technologies not available through the HSP (Section 5.3).

States and territories provide essential ear and hearing-related services, including through:

- public hospitals (Section 5.1)
- neonatal hearing screening programs (Section 4.1)
- other targeted hearing screening programs (Section 7.1.4)
- outreach services.

Non-profit sector provides ear and hearing-related services, including through:

- clinical and cochlear implant services
- rehabilitation services including clinical allied health and therapy services (including NDIS service providers), education services
- advocacy, research and professional training.

This report includes data from a selection of these programs. More information on ear and hearing health programs: Appendix C.

While the role and benefits of policies and programs are well recognised, a need exists for better evaluation to inform decisions. Gotis-Graham et al. (2020) found, for example, that the 'impact of ENT outreach may be limited by a lack of quality evidence, service coordination and sustainability'.

1.4 The focus of this report

This report is the first national approach to measuring and reporting on Indigenous Australian's ear and hearing health for both adults and children. It brings together available information and data at both national and jurisdictional levels to provide information on:

- status of ear and hearing health
- protective and risk factors
- patient pathways through ear and hearing health services
- impacts of ear and hearing problems
- key gaps in data
- baseline data for further health and service monitoring, where possible.

The report is organised into 7 chapters. In chapters 2 to 6, children are included as a group for comparative purposes relative to other age groups. A more detailed analyses of ear and hearing health among Indigenous children is in Chapter 7.

- **Chapter 2: Prevalence** – presents detailed results on the prevalence of ear and hearing health problems.
- **Chapter 3: Protective and risk factors** – discusses key determinants associated with ear and hearing health.
- **Chapter 4: Screening and diagnosis** – presents information on screening and diagnosis services.
- **Chapter 5: Treatment and rehabilitation** – provides detailed information on the treatment of ear and hearing health conditions in hospitals and provision of assistive devices.
- **Chapter 6: Workforce** – provides information on the size and location of the ear and hearing health workforce.
- **Chapter 7: Ear and hearing health of Aboriginal and Torres Strait Islander children** – presents detailed information on ear and hearing health among Indigenous children aged under 15.
- **Chapter 8: Data gaps and development opportunities** – discusses the limitations of available data on the ear and hearing health of Indigenous Australians, and potential data development opportunities.

Table 1.2 provides an overview of the data sources in this report, by section. Qualitative data provided as part of a consultation process with the ACCHO sector is presented throughout the report, where appropriate, to help provide context to the quantitative data (Appendix B).

Table 1.2 Information and data sources

| Section | Data source | Latest reporting period |
|---|-------------------|-------------------------|
| Prevalence | | |
| Burden of disease from ear and hearing-related disorders | ABDS | 2018 |
| Measured hearing loss | NATSIHS | 2018–19 |
| Reported ear disease or hearing problems (long-term) | NATSIHS | 2018–19 |
| Protective and risk factors | | |
| Public awareness programs | - | - |
| Determinants of ear and hearing health | Various | Various |
| Access to health care | - | - |
| Screening and diagnosis | | |
| Neonatal hearing screening programs | UNHS | 2019–20 |
| Indigenous-specific health checks | MBS | 2020–21 |
| Audiology services | MBS | 2019–20 |
| Emergency department presentations for ear or hearing-related problems | NNAPEDCD | 2018–20 |
| Treatment and rehabilitation | | |
| Hospital admissions for ear or hearing-related problems | NHMD | 2018–20 |
| In-hospital procedures for ear or hearing-related problems | NHMD | 2018–20 |
| Waiting times for key elective ear or hearing-related surgeries | NESWTDC | 2018–20 |
| Provision of hearing aids and cochlear implants | Hearing Australia | 2019 |
| NDIS participants with hearing impairment | NDIA | 2020 |
| Workforce | | |
| Number and rate of audiologists | Census | 2016 |
| Number and rate of ENTs | NHWDS | 2020 |
| Ear and hearing health specialist services in Indigenous-specific primary health-care organisations | OSR | 2019–20 |
| Ear and hearing health of Aboriginal and Torres Strait Islander children | | |
| Prevalence – self reported and measured | NATSIHS | 2018–19 |
| Indigenous-specific health checks | MBS | 2020–21 |
| Hearing Assessment Program – Early Ears (HAPEE) | Hearing Australia | 2019–20 |
| Emergency department presentations for ear or hearing problems | NNAPEDCD | 2018–20 |
| Hospital admissions for ear or hearing-related problems | NHMD | 2018–20 |
| In-hospital procedures for ear or hearing problems | NHMD | 2018–20 |
| Hearing aids and cochlear implants | Hearing Australia | 2019 |
| Data gaps and opportunities | | |
| Data sources used in this report | - | - |
| Data development opportunities | - | - |

Notes:

- denotes areas where data are not available.
- ABDS = Australian Burden of Disease Study: Aboriginal and Torres Strait Islander people, NATSIHS = National Aboriginal and Torres Strait Islander Health Survey; UNHS = Universal Neonatal Hearing Screening programs (states and territories); MBS = Medicare Benefits Schedule; NNAPEDCD = National Non-admitted Patient Emergency Department Care Database; NHMD = National Hospital Morbidity Database; NESWTDC = National Elective Surgery Waiting Times Data Collection; NDIS = National Disability Insurance Scheme; NDIA = National Disability Insurance Agency; Census = 2016 Census of Population and Housing; NHWDS = National Health Workforce Dataset; OSR = Online Services Report.
- A range of government funded programs exist covering public awareness, diagnosis and screening and treatment and rehabilitation provision. Data are only available for some of these programs.

1.5 Impact of COVID-19

This report includes data collected during 2020 and 2021. Collection was affected by the wide-ranging impact of the coronavirus disease 2019 (COVID-19) global pandemic. For data covering 1 July 2019 to 30 June 2020, only the months between March and June 2020 overlap with the pandemic.

In light of the unprecedented impact of COVID-19, the Australian Government and state and territory governments recognised the necessity of reprioritising national efforts and resources towards responding to the major emergency across Australia. Measures put in place as part of government responses in the first half of 2020 had flow-on effects for ear and hearing-related health-care services provided in 2019–20 and beyond.

Some explanations for variations in data due to COVID-19 may include:

- postponement of non-urgent elective surgery, including non-urgent procedures for grommets and myringoplasty (ASOHNS 2022)
- restrictions on travel for patients and staff
- reluctance of some patients to attend during the pandemic or to use telehealth
- difficulties in recording telehealth consultations
- vulnerable staff working from home
- people returning from urban areas to remote areas.

Impacts of COVID-19 on data used in this report are explored in detail in AIHW reports, including:

- MBS data <https://www.aihw.gov.au/reports/health-care-quality-performance/impacts-of-covid19-mbs-pbs-quarterly-data/contents/data-overview>
- MBS Indigenous-specific health checks – Tracking progress against the Implementation Plan goals for the Aboriginal and Torres Strait Islander Health Plan 2013–2023 <https://www.aihw.gov.au/reports/indigenous-australians/tracking-progress-against-ipg-2013-2023/contents/impacts-of-covid-19-on-indigenous-specific-health-checks>
- Emergency department activity <https://www.aihw.gov.au/reports-data/myhospitals/sectors/emergency-department-care>
- Admitted patient activity <https://www.aihw.gov.au/reports-data/myhospitals/intersection/activity/apc>
- Elective surgery waiting times <https://www.aihw.gov.au/reports-data/myhospitals/sectors/elective-surgery>
- Indigenous specific primary health care – nKPI and OSR collections <https://www.aihw.gov.au/reports/indigenous-australians/indigenous-primary-health-care-results-osr-nkpi/contents/impact-of-covid-19>
- The effect of the COVID-19 pandemic on Indigenous Australians' use of health services <https://www.aihw.gov.au/reports/australias-health/australias-health-2022-data-insights/summary>

More AIHW data and information relating to COVID-19: www.aihw.gov.au/covid-19.



2



Prevalence

2 Prevalence



What do we know?

Prevalence data helps identify population groups and regions in greater need of support and services.

The extent of ear and hearing health problems

In 2018–19 among Aboriginal and Torres Strait Islander people aged 7 and over:

- 43% (290,400) had some degree of hearing loss (based on measured data)
- Only 9% (61,600 people) had hearing loss and also reported long-term hearing loss
- hearing loss increased with age, from 29% (42,200) of children aged 7–14, to 82% (79,800) of those aged 55 and over (based on measured data).

Indigenous Australians are overrepresented in the prevalence of ear or hearing problems.

In 2018, the estimated age-standardised rate of burden of living with these problems was 3.6 times the rate for non-Indigenous Australians (measured as years lived with disability, YLD).

This chapter describes the prevalence of ear and hearing problems among Indigenous Australians. It includes the burden of ear and hearing problems, number experiencing ear and hearing problems, population groups more likely to experience poor ear health, and main ear and hearing health conditions.

This chapter presents information from the Australian Burden of Disease Study 2018 and the 2018–19 NATSIHS, which collected information on:

- measured hearing loss data from a voluntary hearing test for people aged 7 and over
- reported data on long-term ear and hearing problems for all ages (Box 2.1).

Detailed information on the prevalence of ear and hearing problems among Indigenous children is presented in Chapter 7.

2.1 Burden of disease from ear and hearing-related disorders

This section presents information from the Australian Burden of Disease Study 2018 on the burden experienced by Indigenous Australians from living with hearing loss, otitis media and other hearing and vestibular disorders, measured using years lived with disability (YLD). These are referred to as 'ear or hearing-related conditions'.

Overall: In 2018, Indigenous Australians lost 5,199 years of healthy life due to living with ear or hearing-related conditions (YLD). The age-standardised rate of burden (YLD per 1,000 population) was 3.6 times the rate for non-Indigenous Australians (age-standardised rates of 9.7 and 2.7 YLD per 1,000 population respectively).

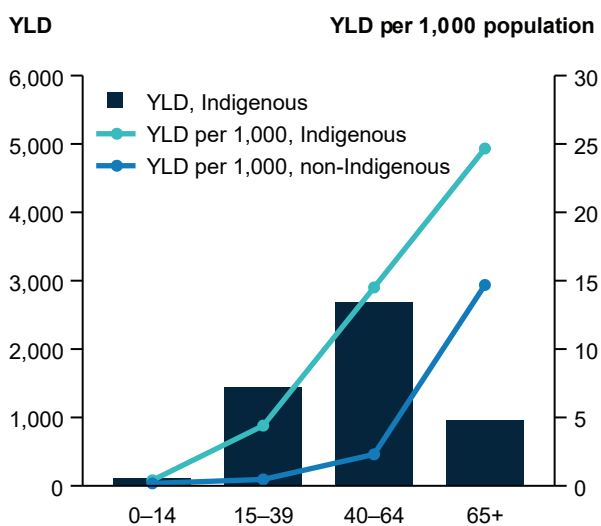
Causes: Hearing loss was the main cause of burden for Indigenous Australians from ear or hearing-related conditions in 2018 (4,714 YLD or 5.7 YLD per 1,000 population respectively). Other hearing and vestibular disorders contributed 420 YLD (0.5 per 1,000 population) and otitis media 65 YLD (0.1 per 1,000 population).

Age: The rate of burden due to ear or hearing-related conditions increased with age. It was highest for Indigenous Australians aged 65 and over and lowest for Indigenous children under 15 (25 YLD and 0.4 YLD per 1,000 population respectively) (Figure 2.1a).

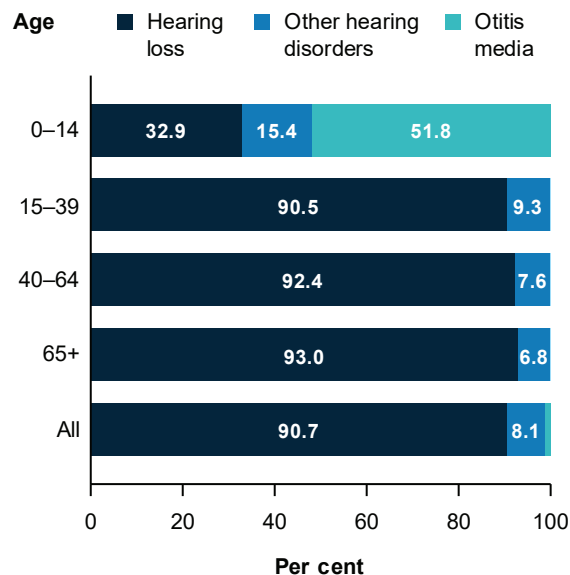
Otitis media among children under 15: Almost all the burden from otitis media was seen among Indigenous children aged 0–14 (0.2 per 1,000 population) compared with Indigenous Australians aged 15 and over (0.01 per 1,000 population) (Figure 2.1b). The burden of otitis media among Indigenous children was 3.5 times the rate experienced among non-Indigenous children (0.2 and 0.06 YLD per 1,000 population respectively).

Figure 2.1: Years lived with disability (YLD) from ear or hearing-related conditions^(a), 2018

a) YLD and rates (YLD per 1,000 population), by age and Indigenous status



b) Proportion (%) of YLD for Indigenous Australians, by age and cause status



Notes:

(a) Years lived with disability (or non-fatal burden) from hearing loss, otitis media and other hearing and vestibular disorders.

1. YLD = years lived with disability.

2. Figure b) presents each cause as a proportion of total non-fatal burden from ear or hearing-related conditions.

3. Data for these figures are available in the supplementary tables.

Source: AIHW Australian Burden of Disease database

2.2 Measured hearing loss

This section presents estimates of the prevalence and severity of measured hearing loss among Indigenous Australians aged 7 and over, based on results from a voluntary hearing test conducted in NATSIHS 2018–19.

Box 2.1 Measured and reported ear or hearing problems

Measured hearing loss

In the NATSIHS 2018-19 measurements of hearing were collected from respondents aged 7 years and over who did not have a cochlear implant using a voluntary, self-administered test. This was the first time this data has been collected by the ABS– 46% of participants completed the test. The hearing test required respondents to listen through headphones to a series of beeps over two audio frequencies (one kilohertz and four kilohertz) and respond to hearing a beep by pressing a key on the laptop (ABS 2019b).

The hearing test may have limitations:

- testing undertaken in the field with background noise, rather than in a soundproof room
- children who do not present with hearing loss at the time of the test, may experience hearing loss at other times (due to the episodic nature of ear disease)
- hearing loss at the time of the test may be temporary, due to short-term ear congestion associated with a short-term illness or ear infection. It may not indicate the presence of an ongoing or recurring problem
- children can have otitis media with no symptoms or hearing loss
- the hearing test measures the participant's hearing on the day of the test and is not a comprehensive diagnostic test (ABS 2019c, 2020).

Reported hearing loss

NATSIHS 2018-19 asked respondents about ear or hearing problems that have lasted or are expected to last for 6 months or more (ABS 2019c). An adult (parent or guardian) was asked to respond on behalf of children aged 0–14 and provided the option to respond on behalf of children aged 15–17.

NATSIHS reported survey data may underestimate the true prevalence of ear and hearing conditions. Reported data excludes short-term ear and hearing conditions, including some infections, traumas or injuries. The data will not include conditions that people are not aware they have, or have chosen not to disclose for example, some people may not report a condition due to cultural and social reasons such as social stigma related to ear disease and hearing loss, or because it is personally sensitive (ABS 2020; Senate Community Affairs References Committee 2010).

2.2.1 Measured hearing loss in one or both ears

Overall: In 2018–19, an estimated 290,400 (43%) Indigenous Australians aged 7 and over were found to have hearing loss in one (20%) or both ears (23%) (Table 2.1).

Age: The proportion of Indigenous Australians with measured hearing loss increased steadily with age. An estimated 29% (42,200) of Indigenous children aged 7–14 and 82% (79,800) of Indigenous Australians aged 55 and over were found to have hearing loss in one or both ears (Table 2.1).

Table 2.1: Estimated number of Aboriginal and Torres Strait Islander people with hearing loss by age (in thousands)

| Age (years) | No measured hearing loss | With measured hearing loss | | | Total |
|--------------|--------------------------|----------------------------|--------------------|-------------------------|---------------------|
| | | One ear only | Both ears | Total with hearing loss | |
| 7–14 | 102.9 (71%) | 24.0 (17%) | 18.1 (12%) | 42.2 (29%) | 145.1 (100%) |
| 15–24 | 111.1 (71%) | 29.7 (19%) | 15.3 (10%) | 44.7 (29%) | 155.5 (100%) |
| 25–34 | 79.2 (67%) | 25.5 (22%) | 13.3 (11%) | 39.1 (33%) | 117.8 (100%) |
| 35–44 | 49.6 (59%) | 16.2 (19%) | 17.9 (21%) | 33.9 (41%) | 83.7 (100%) |
| 45–54 | 30.7 (38%) | 22.2 (27%) | 28.3 (35%) | 50.7 (62%) | 81.8 (100%) |
| 55 and over | 17.6 (18%) | 18.2 (19%) | 61.7 (63%) | 79.8 (82%) | 97.6 (100%) |
| Total | 390.8 (57%) | 135.8 (20%) | 154.3 (23%) | 290.4 (43%) | 681.0 (100%) |

Note: Estimated number in thousands.

Source: ABS National Aboriginal and Torres Strait Islander Health Survey 2018–19: Table 32.1.

Sex: Measured hearing loss was similar among Indigenous males (43%) and females (42%) (Table 2.2). Among Indigenous children aged 7–14, a greater proportion of Indigenous girls (35%) had measured hearing loss than Indigenous boys (23%) (Figure 2.2a). Whereas a greater proportion of Indigenous men aged 55 and over (90%) had measured hearing loss than Indigenous women aged 55 and over (75%).

Table 2.2: Estimated number of Aboriginal and Torres Strait Islander people aged 7 and over with hearing loss by sex (in thousands)

| Sex | No measured hearing loss | With measured hearing loss | | | Total |
|--------------|--------------------------|----------------------------|--------------------|-------------------------|---------------------|
| | | One ear only | Both ears | Total with hearing loss | |
| Male | 189.0 (57%) | 63.1 (19%) | 79.2 (24%) | 142.8 (43%) | 331.8 (100%) |
| Female | 201.7 (58%) | 72.6 (21%) | 75.1 (22%) | 147.4 (42%) | 349.3 (100%) |
| Total | 390.8 (57%) | 135.8 (20%) | 154.3 (23%) | 290.4 (43%) | 681.0 (100%) |

Note: Estimated number in thousands.

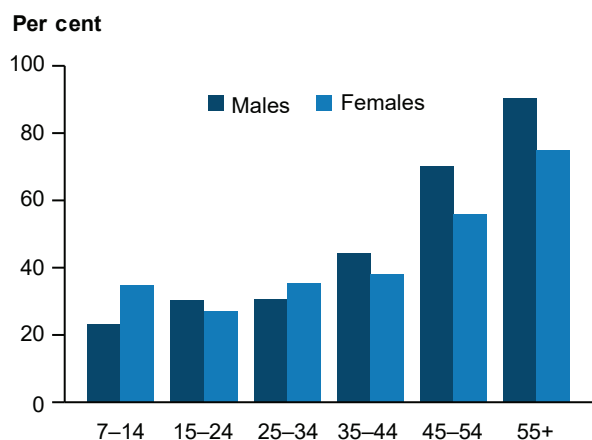
Source: ABS National Aboriginal and Torres Strait Islander Health Survey 2018–19: Table 32.1.

Remoteness area: For all age groups, measured hearing loss increased with remoteness (Figure 2.2b). This difference between remoteness areas was greatest among people aged 15–54 (30 percentage points difference between *Major cities* and *Remote and very remote* areas).

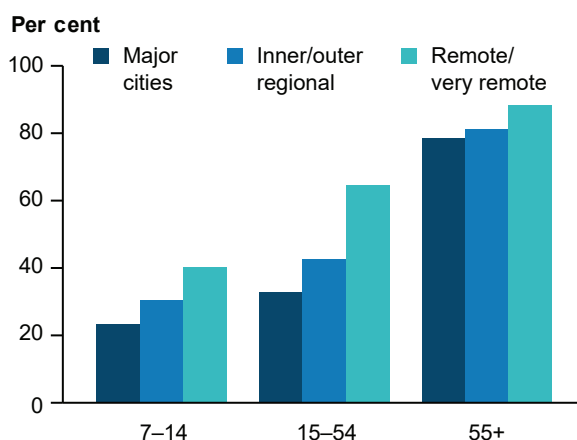
State/territory: The proportion of Indigenous Australians with measured hearing loss was highest in the Northern Territory (60%). The proportion was lowest in Victoria (33%) and Tasmania (34%) (Figure 2.2c).

Figure 2.2: Measured hearing loss, Aboriginal and Torres Strait Islander people aged 7 and over, by selected characteristics, 2018–19

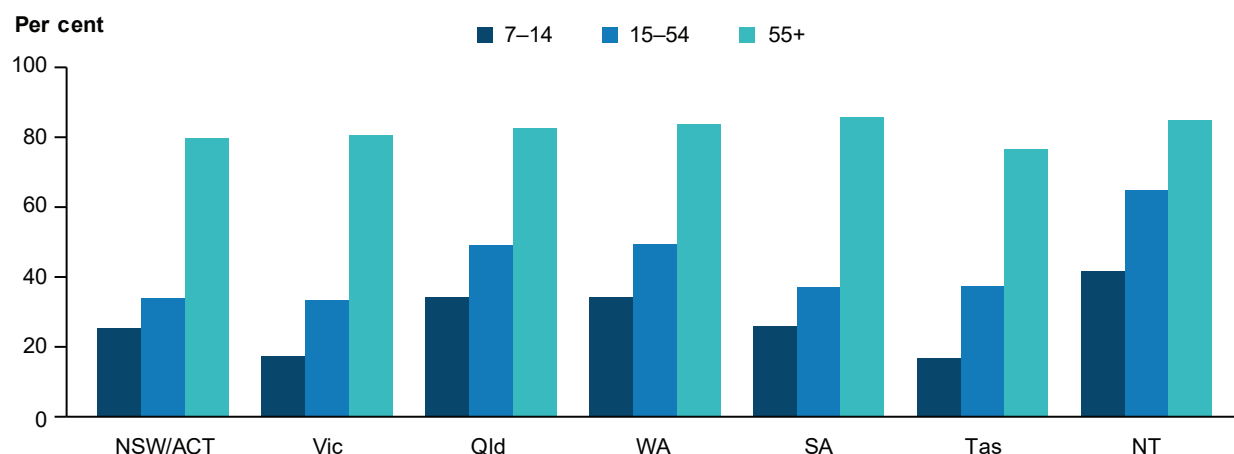
a) By age and sex



b) By age and remoteness area



c) By state/territory and age



Notes:

1. Data for measured hearing loss were imputed for all participants who elected not to complete the hearing test.

2. Data for these figures are available in the supplementary tables.

Source: AIHW analysis of ABS National Aboriginal and Torres Strait Islander Health Survey 2018–19; ABS 2019.

2.2.2 Severity of measured hearing loss

For Indigenous Australians with measured hearing loss in both ears, the severity of hearing impairment was determined using the quietest sound a person could hear in their better ear (Box 2.2). Using this measurement of hearing impairment, people with hearing loss in one ear only are not classified as having a hearing impairment.

Box 2.2 Measuring hearing impairment

Two measures of hearing status are used in this report: hearing loss and hearing impairment.

Hearing loss may affect one ear (unilateral) or both ears (bilateral).

Hearing impairment is based on the ear with better hearing, meaning that people with unilateral hearing loss are not defined as having a hearing impairment. The severity of hearing impairment is classified based on the lowest volume of sound a person can hear.

The classifications are:

Mild (21–40dB): The person may hear speech, but soft sounds are hard to hear, such as whispers or the consonants on the end of words like ‘shoes’ or ‘fish’.

Moderate (41–70dB): The person may hear another person speaking at a normal level, but have difficulty understanding what they are saying. They might hear the vowels within a sentence, but not hear the consonants. This makes comprehending a sentence almost impossible.

Severe (71–90dB): The person may hear little to no speech of a person talking at a normal level and only some loud sounds. Very loud sounds, such as a car horn, are not as startling as they would be to a person with normal hearing.

Profound (91dB+): The person cannot hear any speech. They can only hear very loud sounds, and feel the vibrations of only the loudest of sounds (AIHW 2020b; Cochlear Australia n.d.).

Overall: In 2018–19, 43% (estimated 290,400) of Indigenous Australians aged 7 and older had hearing loss or hearing impairment. This comprised:

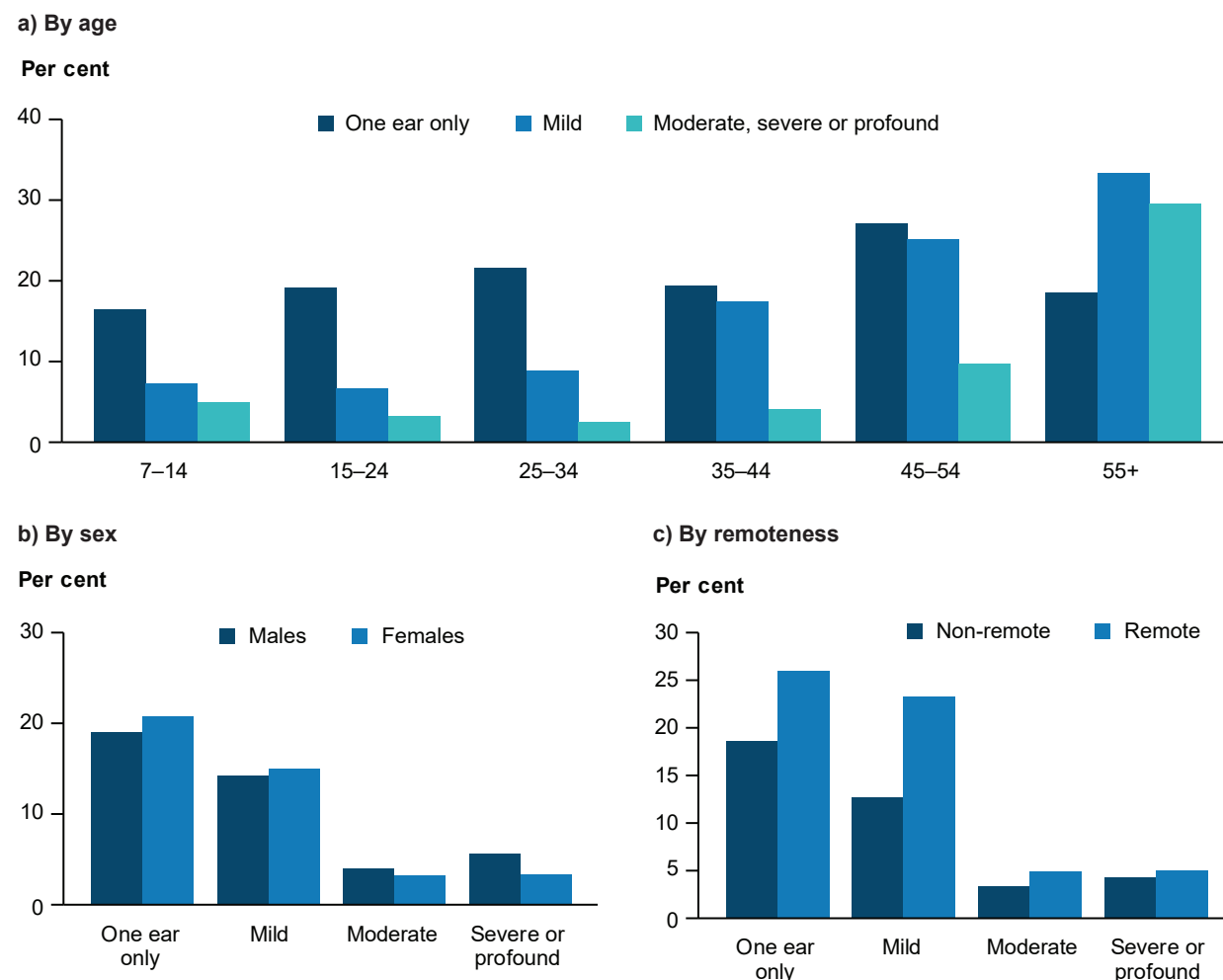
- 20% with hearing loss in one ear only
- 15% with a mild hearing impairment
- 3.6% with a moderate hearing impairment
- 4.4% with a severe or profound hearing impairment (ABS 2019c).

Age: Indigenous Australians aged 7 to 34 were more likely to have hearing loss in one ear only than a hearing impairment. For example, among Indigenous children aged 7–14, 17% had hearing loss in one ear only and 13% had hearing impairment in both ears. In comparison, rates were much higher among Indigenous Australians aged 55 and over – 63% had hearing impairment in both ears and 18% had hearing loss in one ear only.

Sex: A higher proportion of males (5.6%) had a severe or profound hearing impairment than females (3.3%) (Figure 2.3b). For all other levels of hearing loss (hearing loss in one ear only or a mild to moderate hearing impairment), the proportion of males and females was similar.

Remoteness area: A greater proportion of people in *Remote* areas had hearing loss in one ear only or a mild hearing impairment compared with *Non-remote* areas (Figure 2.3c). The proportion of people with moderate, severe or profound hearing loss was similar in *Remote* and *Non-remote* areas.

Figure 2.3: Severity of hearing loss among Indigenous Australians aged 7 and over, by selected characteristics, 2018–19



Notes:

1. In figure (b) 'Remote' includes *Remote* and *Very remote* areas and 'Non-remote' includes *Major cities*, *Inner regional* and *Outer regional* areas.
2. Data for measured hearing loss was imputed for all participants who elected not to complete the hearing test.
3. Data for these figures were available in the supplementary tables.

Source: AIHW and ABS analysis of ABS National Aboriginal and Torres Strait Islander Health Survey 2018–19.

2.2.3 Hearing loss, education and employment

Measured hearing loss is correlated with several key socioeconomic outcomes. For instance, among all Indigenous Australians who did not have any hearing loss, 41% had completed Year 12 or equivalent educational qualifications, and 56% were employed. The equivalent proportions among Indigenous Australians who had measured hearing loss in one or both ears were 26% and 40% respectively. Among those with hearing loss in both ears, only 21% had completed Year 12 or equivalent, and 32% were employed (ABS 2019c; AIHW 2021f).

The severity of hearing impairment is also associated with these outcomes. For instance, among those with a severe or profound hearing impairment, 18% had completed Year 12, and 17% were employed, compared with 23% with Year 12 and 36% employed among those with a mild hearing impairment (ABS 2019c; AIHW 2021f).

2.3 Reported long-term ear or hearing problems

This section presents estimates from NATSIHS 2018–19 of reported ear or hearing problems expected to last for 6 months or more among Indigenous Australians of all ages (Box 2.1).

Overall: In 2018–19, an estimated 14% (111,700) of Indigenous Australians reported that they had a long-term ear or hearing problem. After adjusting for age differences between the 2 populations, Indigenous Australians were 1.4 times more likely to report long-term ear or hearing problems than non-Indigenous Australians (AIHW 2020a).

Types of ear/hearing problems: Reported long-term ear or hearing problems were categorised into hearing loss, otitis media, and other diseases of the ear and mastoid. People could report experiencing conditions in more than one category. In 2018–19, 10% of Indigenous Australians reported hearing loss, 1.3% reported otitis media, and 3.3% reported other diseases of the ear or mastoid.

The prevalence of reported hearing loss increased with age, with 3.8% of Indigenous children aged 0–14 reporting hearing loss. This increased to 30% of those aged 55 and over. Indigenous children aged 0–14 were more likely to have otitis media than older age groups (2.6% in children compared with 1.0% or less in older age groups) (Figure 2.4a).

Age: The prevalence of ear or hearing problems increased with age and was lowest among those aged 0–14 (6.9%) and highest among those aged 55 and over (34%) (Figure 2.4b).

Sex: The proportion of Indigenous Australians reporting ear or hearing problems was the same for males and females (14%). Among those aged 55 and over, males (38%) were more likely to report ear or hearing problems than females (31%). (Figure 2.4b).

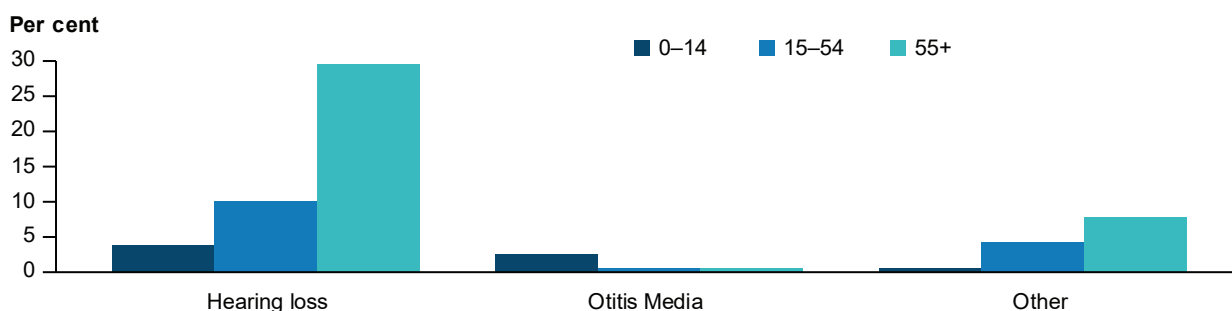
Remoteness area: The proportion of Indigenous Australians reporting ear or hearing problems was similar for those living in *Remote and very remote* areas (13%) and *Non-remote* areas (14%). The most notable difference was among Indigenous Australians aged 55 and over, with those living in *Remote and very remote* areas (25%) were less likely to report ear or hearing problems than those living in *Major cities* (35%) or *Inner and outer regional* areas (37%) (Figure 2.4c).

State/territory: The proportion of Indigenous Australians reporting an ear or hearing problem was highest in Tasmania (17%) and lowest in Northern Territory (10%). For Indigenous children aged 0–14, the rate was highest in Western Australia (9.0%) and lowest in Victoria (5.7%) (Figure 2.4d).

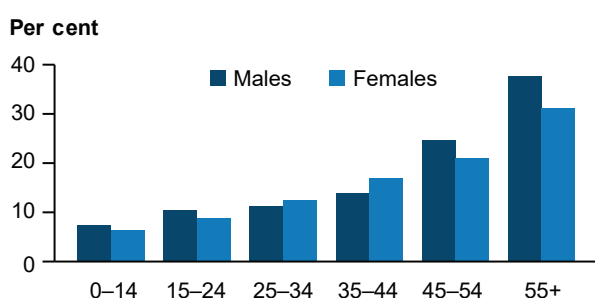
Time trend: Overall, the proportion of Indigenous Australians reporting an ear or hearing problem was similar between 2001 (15%) and 2018–19 (14%). For Indigenous children aged 0–14, the proportion with an ear or hearing problem decreased from 11% to 6.9% over the same period (Figure 2.4e).

Figure 2.4: Reported long-term ear/hearing problems among Indigenous Australians, by selected characteristics

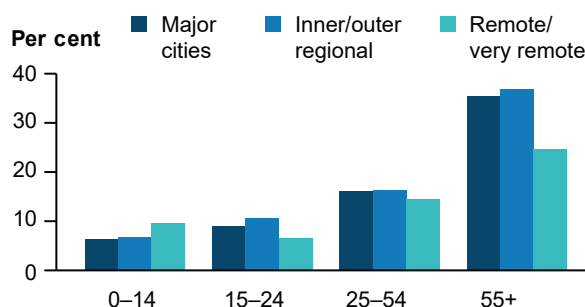
a) By type of ear/hearing problem and age, 2018–19



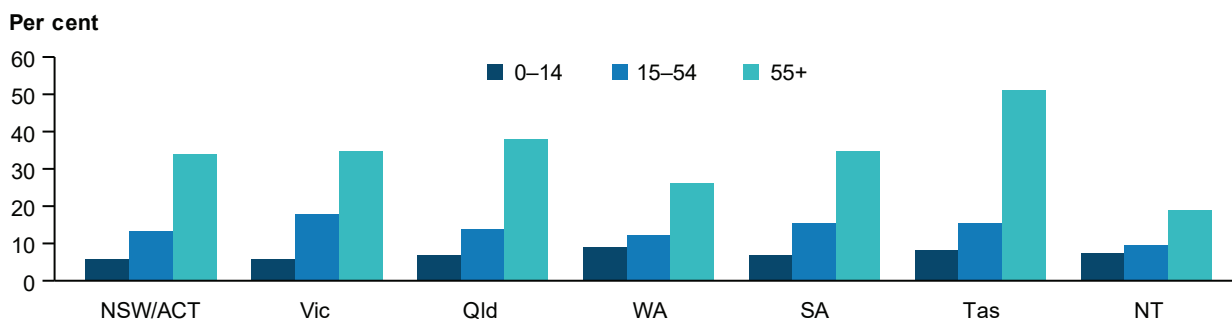
b) By age and sex, 2018–19



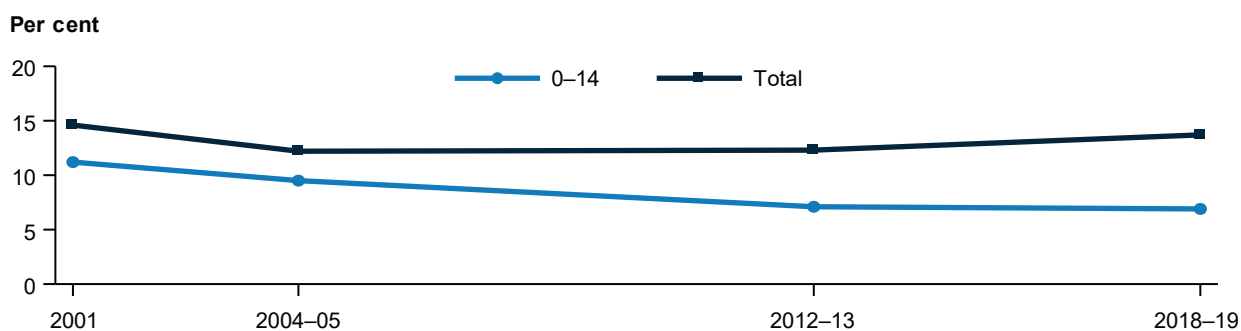
c) By age and remoteness area, 2018–19



d) By state/territory and age, 2018–19



e) Time trend, by age, 2001 to 2018–19



Note: Data for these figures are available in the supplementary tables.

Source: AIHW analysis of ABS National Health Survey 2001, National Aboriginal and Torres Strait Islander Health Survey 2004–05, Australian Aboriginal and Torres Strait Islander Health Survey 2012–13 and National Aboriginal and Torres Strait Islander Health Survey 2018–19.

2.4 Comparing measured and reported hearing loss

Measuring the proportion of people with measured hearing loss who did not report hearing loss can assist in identifying the degree to which hearing loss may be under-reported among Indigenous Australians (ABS 2020). The reported data in this section are limited to people who reported long-term deafness or hearing loss in one or both ears. This excludes people who reported other ear conditions, such as otitis media, which may cause short-term hearing loss.

In 2018–19, among Indigenous Australians aged 7 and over:

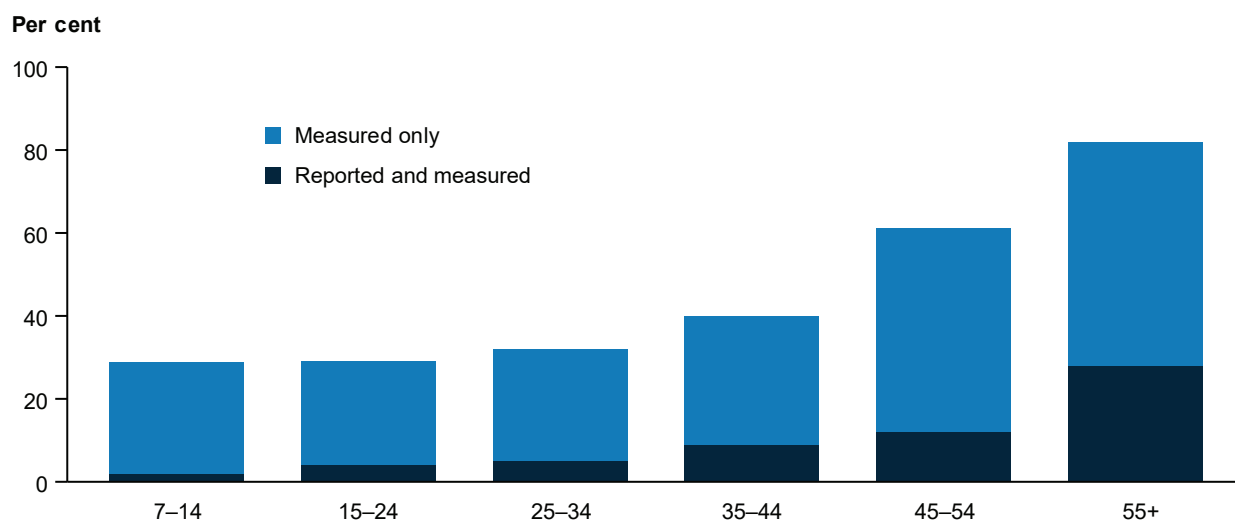
- 34% (228,500 people) had measured hearing loss and did not report long-term hearing loss.
- 9% (61,600 people) reported long-term hearing loss and had measured hearing loss
- 3% (17,500 people) reported long-term hearing loss and did not have measured hearing loss.

The proportion of Indigenous Australians who both reported long-term hearing loss and had measured hearing loss increased with age, from 2% among children aged 7–14 to 28% among adults aged 55 and over (Figure 2.5).

Among Indigenous Australians with measured hearing loss, almost 8 in 10 (79%) did not report hearing loss. Reported hearing loss was highest among those with a moderate, severe or profound hearing impairment (47%). It was lowest among those with a mild hearing impairment (18%) or hearing loss in one ear (13%).

Reporting was lower among Indigenous Australians living in *Remote or very remote* areas (16%), compared with Indigenous Australians living in *Non-remote* areas (23%).

Figure 2.5: Measured and reported hearing loss among Indigenous Australians aged 7 and over, by age, 2018–19



Notes:

1. Reported and measured estimates for Indigenous children aged 7–14 and Indigenous adults aged 35–44 have a high standard error and should be used with caution.
2. Reported hearing loss includes participants who reported complete deafness, partial deafness or hearing loss in one or both ears.
3. Data for measured hearing loss were imputed for all participants who elected not to complete the hearing test.
4. Data for this figure are available in the supplementary tables.

Source: AIHW analysis of ABS National Aboriginal and Torres Strait Islander Health Survey 2018–19.



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Protective and risk factors

3 Protective and risk factors



What do we know?

Ear disease and hearing loss experienced by Aboriginal and Torres Strait Islander people is largely preventable. The broad range of factors that contribute to ear and hearing health are complex. This chapter addresses those relating to public awareness, determinants of ear and hearing health over the lifespan, and access to health care.

Public awareness

Public awareness of ear and hearing problems is a key protective factor in preventing ear disease and hearing loss. Raising awareness about ear and hearing health and associated risk factors helps decrease prevalence and severity of ear and hearing problems and improve access to treatment and outcomes.

Determinants of ear and hearing health over the life span

During pregnancy, birth and childhood:

- protective factors include antenatal care, avoiding smoke exposure, vaccination, support for breastfeeding, good hygiene and adequate housing
- risk factors include birth complications, low birth weight or premature birth, hereditary and non-hereditary genetic factors

For all ages:

- protective factors include managing repeated or chronic ear infections and other chronic conditions, limiting repeated exposure to loud workplace and recreational noise and reducing smoking rates
- risk factors include ageing, injury or trauma to the ear or head, use of ototoxic medications and exposure to ototoxic chemicals and workplace noise.

Access to health care

Access to adequate ear and hearing health-care services may be impacted by a range of factors, including:

- accessibility and availability of culturally appropriate ear and hearing health services
- racism and unconscious bias from health-care providers
- complexity of the ear health system and continuity of care.

A broad range of protective and risk factors contribute to the ear and hearing health of Indigenous Australians. This chapter looks at those relating to public awareness, determinants of ear and hearing health, and access to health care. The chapter also provides examples of strategies used by the ACCHO sector to support good ear and hearing health.

3.1 Public awareness

Public awareness of ear and hearing problems is a key protective factor in preventing ear disease and hearing loss. National Acoustic Laboratories (2020) noted:

There is consensus among parents and carers that clear advice is needed: 'We want to know what to do, what are the signs, where to go'. There is low awareness of actions that prevent or reduce ear infection among parents and carers and low awareness of signs, symptoms and impacts particularly for expectant, new and young parents, unless the family has had personal experience.

Public awareness campaigns can help people recognise early signs and symptoms, modify risks, access health-care and services, and understand the importance of following treatment procedures (Box 3.1). Such campaigns can also support the inclusion of people with hearing loss in the community and reduce the stigma of assistive devices. They can also target health-care providers, teachers and other professionals (Section 1.3.1 Ear and hearing health services) to build skills to identify ear and hearing problems, navigate complex referral pathways to specialist services, and provide support.

Box 3.1: Raising awareness among new parents

Apunipima Cape York Health Council (Apunipima) is an Aboriginal Community Controlled Health Organisation, providing primary health care to 11 Cape York Communities. Apunipima developed the Baby One Program to support families, women and their children during and after pregnancy up to 1,000 days of life. The program:

'provides health education to pregnant women and young families, including the signs and symptoms of otitis media and hearing loss, and the importance of speech and language development for young children. Some of Apunipima's communities have had access to self-developed health education programs for young school aged children, including the importance of good hearing, good hygiene, how to care for ears, and how to seek help when ears are painful or blocked'.

(Quote from ACCHO sector consultation participant, see Appendix B)

A variety of awareness activities are delivered through primary health-care, including bespoke, locally developed programs and programs developed and funded by the Australian Government and state and territory governments (Box 3.2). Examples of some activities include:

- using the Australian Government's Care for Kids' Ears resources
- providing resources and screening at local events, such as sporting events
- running health education programs for pregnant women and young families
- participating in campaigns such as World Hearing Day and Hearing Awareness Week, to promote awareness of the signs and symptoms of otitis media and the risks of noise exposure.

Box 3.2: Initiatives to increase awareness of ear and hearing health

The ACCHO sector uses a range of initiatives and platforms to raise awareness of ear and hearing health in their communities. Many ACCHOs provide customised information about locally available services. This ranges from providing information in hard-copy handouts to website information and social media campaigns.

Special events and community activities are also ways to raise awareness. One ACCHO, for example, provided screening tests at a local sporting event, using promotional bags and education booklets to encourage interest. They were able to provide referrals to the local ACCHO service and local GPs if an abnormal result was detected during screening.

3.2 Determinants of ear and hearing health over the life span

Hearing loss may result from ageing and genetic causes, complications at birth, low birth weight, certain infectious diseases, chronic ear infections, use of certain medicines, injuries and accidents, smoke exposure and noise (Figure 1.1).

3.2.1 Pregnancy, birth and childhood

Worldwide, 60% of childhood hearing loss is due to preventable causes (WHO 2017). High-quality care during pregnancy decreases the risk of birth complications, low birth weight, premature birth and infections during pregnancy that can cause congenital hearing loss. Among live births to Indigenous women, 12% were born low birthweight (about 4,900 babies) (AIHW 2021g).

The main cause of congenital hearing loss is hereditary and non-hereditary genetic factors. A family history of hearing loss, particular genes and some syndromes can also increase the risk of progressive genetic hearing loss at any age. These are not preventable (Shearer AE 2017, Smith A 2019, WHO 2016, WHO 2021). However, regular and timely screening of those at-risk can help improve outcomes if hearing loss occurs.

During pregnancy and childhood a number of vaccine-preventable conditions including rubella, measles, *Haemophilus influenzae* type b (Hib), pneumococcus, meningococcus and influenza can also cause congenital and acquired hearing loss. In 2020, the national immunisation coverage rate for Indigenous children aged 5 years exceeded the target of 95% coverage (Department of Health 2021). Coverage rates for Indigenous Australians aged 1, 2 and 5 years were 93.7%, 91.7% and 97.3% respectively.

The 2020 *Otitis media guidelines for Australian Aboriginal and Torres Strait Islander children: summary of recommendations* (Leach et.al. 2020) recommend several evidence based preventive strategies for otitis media, particularly:

- breastfeeding babies for at least the first 6 months
- avoiding smoke exposure
- frequent handwashing for children attending day care centres
- keeping children away from sick children and those with a runny nose, especially at day care centres.

Reducing smoking rates and exposure to second-hand smoke can also reduce the risk of preterm births and low birthweight, and of adults developing sensorineural hearing loss (Leach et al. 2021; NACCHO & RACGP 2018; Jones et al. 2012; Dawes et al. 2014; Lalwani et al. 2011). Smoking rates have been falling for Indigenous Australians aged 15 and over. However in 2018–19, Indigenous Australians were 2.9 times as likely to be a current smoker as non Indigenous Australians (age-standardised rates of 41% compared with 14% respectively) (AIHW 2021e).

Overcrowded or inadequate housing increases the risk of infections, such as otitis media and respiratory infections associated with hearing loss including pneumococcal disease. A study in Northern Territory remote communities found that having a greater number of children aged under 5 in a household increased the risk of the youngest child contracting otitis media (Leach et al. 2014).

3.2.2 Adults and all ages

Age-related sensorineural hearing loss is one of the main causes of hearing loss and is not preventable. As people age, functioning in the cochlea or inner ear gradually declines, reducing their ability to distinguish similar speech sounds or hear in noisy environments (Senate Community Affairs References Committee Hear Us report 2010). Timely diagnosis can help remediate the impact of age-related hearing loss.

Repeated exposure to loud noise is one of the most common preventable causes of hearing loss. Workplace noise and recreational noise are the most common source of damaging noise exposure, including regular exposure to loud music, television and personal media devices.

Early identification and appropriate management of some chronic health conditions and malnutrition can reduce the risk of developing ear and hearing problems. These conditions include ear health conditions such as repeated or chronic otitis media, as well as heart disease and diabetes (Bainbridge et al. 2008; Helzner & Contrera 2015; Lin et al. 2012). In 2018–19, 13% of Indigenous Australians reported having diabetes or high blood/urine sugar levels, 2.8 times the rate for non-Indigenous Australians (AIHW 2021c).

Traumas and injuries to the ear (ear canal, ear drum, middle ear bones or inner ear) or head may also result in temporary or permanent hearing loss or vestibular problems due to damage to the ear drum, skull or related nerves.

Certain medications and chemicals – termed ototoxic – can cause damage to the hair cells in the inner ear, which can lead to hearing loss. For some medications, hearing loss is temporary, reversing when the drug is discontinued. For others it can be permanent. The use of ototoxic medications in pregnant women can affect their hearing health and that of their newborns (Duthey 2013).

3.3 Access to health care

Systemic barriers exist to Indigenous Australians accessing ear and hearing health services, including (Burns & Thomson 2013; Gotis-Graham et al. 2020, AIHW 2021a):

- patients' perception of how culturally safe services are (Box 3.3)
- discrimination from health-care providers and experiences of racism in health-care environments for patients, families or community members, and fear of how they will be treated
- racism and unconscious bias within the healthcare system creates barriers to accessing healthcare and may, for example, result in a failure to refer patients to ENT specialists.

Quigley et al. (2020) explored the impacts of implicit bias towards Indigenous Australian patients within emergency departments, finding that Indigenous Australians:

...suffer adverse experiences in healthcare, with inequitable care prevalent in emergency settings. Individual, institutional and systemic factors play a significant part in these persisting healthcare disparities, with biases remaining entrenched in healthcare institutions. This includes implicit racial bias which can result in stereotyping of racial minorities and premature diagnostic closure. Furthermore, it may contribute to distrust of medical professionals resulting in higher rates of leave events and hinder [Indigenous Australians] from seeking care or following treatment recommendations.

Other barriers include:

- complexity of the referral pathway for specialists and long wait times for follow up services
- wide geographic spread and isolation of some Indigenous communities
 - audiologists and ENT specialists work mostly in metropolitan areas and outreach visits by audiologists and ENT specialists are costly and infrequent
 - the high mobility of Indigenous families may mean they are not present during outreach services visits
- access to transport services
- affordability of health-care services plus indirect costs of transportation, time taken for travel and taking time off work.

Box 3.3: Cultural safety

Improving cultural safety for Indigenous Australians can improve access to, and the quality of health care. Cultural safety is an essential component of access to and the quality of health care. This means a health system that respects Indigenous cultural values, strengths and differences, and also addresses racism and inequity (AIHW 2021 a).

The ACCHO sector (see Appendix B) noted the importance of culturally respectful and safe health-care services.

'Having a trained Aboriginal or Torres Strait Islander Ear Health worker is absolutely essential for a successful program. The young kids we visit at school (or those that attend the clinic) feel culturally safe and related and we become a familiar face as we see them throughout their starting years at school.'

'Visits are significantly more successful when community can assist with a nurse or driver to help locate community members and help with language barriers and clients feel more culturally safe if a community member can attend with them.'

'Referring clients to another service is not always an appropriate method of service delivery with reports of clients not showing up to the appointment due to feeling culturally unsafe.'



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Screening and diagnosis

4 Screening and diagnosis



What do we know?

Timely detection and accurate diagnosis of ear disease and hearing loss is essential for early intervention and prompt access to appropriate treatment and rehabilitation services. Early diagnosis can prevent further hearing loss or ongoing problems. In the case of some ear disease, early diagnosis and appropriate treatment can prevent associated hearing loss.

The use of screening and diagnosis services

- In 2019–20, between 94% and 99% of eligible (medically suitable) Australian and Torres Strait Islander babies completed neonatal hearing screening under state and territory programs in Western Australia (Western Australia's public maternity hospitals only), Queensland, South Australia, and the Northern Territory (for the Top End Health Service). While all states and territories have universal hearing screening programs for Indigenous babies, these states and territories had data accessible for reporting in 2019–20
- In 2020–21, one in 4 (236,000 or 27%) Indigenous Australians had an ear and hearing check as part of an Indigenous-specific health check
- In 2019–20, 7,400 (8.7 per 1,000 population) Indigenous Australians of all ages received at least one Medical Benefits Schedule (MBS) subsidised audiology services (13,800 audiology services provided in total). Audiology service rates were highest among Indigenous children aged 0–14 (4,600 children, 16 per 1,000 population). However, rates for Indigenous children aged 0–14 were lower than for non-Indigenous children aged 0–14 (a difference of 2.9 per 1,000 population). Rates for Indigenous Australians aged 65 and over were 35% lower than for non-Indigenous Australians aged 65 and over.
- In 2018–20, there were 18,100 emergency department presentations by Indigenous Australians for ear or hearing-related problems (11 per 1,000 population), more than twice the rate among non-Indigenous Australians.

Primary health-care providers play a key role in detecting ear problems, treating many ear and hearing health conditions and referring people to more specialised care. Diagnosing hearing loss and more complex cases of ear disease usually requires further assessment by an audiologist or ENT specialist.

Ear or hearing screening can occur opportunistically at primary health-care visits, including visits with GPs, nurses, Aboriginal Health Workers or community hearing health workers. Some regions also provide targeted screening programs. These include school-based programs like those operated by Earbus or Winnunga Aboriginal Health Care Service (Appendix C). Screening may also occur through universal screening programs, such as neonatal hearing screening.

People may also present at an emergency department for ear disease or hearing loss because they have severe symptoms or lack access to, or awareness of, primary health-care services.

Information in this chapter comes from 4 sources:

- neonatal hearing screening programs in states and territories (where accessible)
- Indigenous-specific health checks subsidised by the MBS
- audiology services subsidised by the MBS
- emergency department presentations for ear or hearing problems.

More information on ear and hearing health checks for Indigenous children: Chapter 7.

4.1 Neonatal hearing screening and diagnosis

Universal Neonatal Hearing Screening is used to detect bilateral moderate to profound permanent congenital hearing impairment in infants, which occurs in one to 2 infants per 1,000 births. All state and territory governments have screening programs that aim to screen all eligible infants as early as possible. This is through non-invasive, automated tests, such as automated auditory brainstem response (AABR) technology, which can be performed bedside in term and pre-term infants soon after birth (Patel & Feldman 2011). Neonatal hearing screening leads to earlier identification of congenital hearing loss, earlier intervention, and ultimately better language development and outcomes (Ching et al. 2006; Leigh 2010; Neumann et al. 2019; Pimperton et al. 2016; Sininger et al. 2009).

This section provides information on participation in screening, referrals and diagnoses from neonatal hearing screening programs in Victoria, Queensland, Western Australia (for births in public maternity hospitals only), South Australia and the Northern Territory. Data from the Northern Territory was provided separately for the Top End Health Service and the Central Health Service screening programs. While all states and territories have universal hearing screening programs for Indigenous babies, these programs had data accessible for reporting. More details: Appendix C.

States and territories collect data on their newborn hearing screening programs. However, the content and scope varies. This includes methods for collecting Indigenous status. There is a clear need for consistent and comparable national neonatal hearing screening indicators and a national data set. Ongoing efforts towards this goal are substantial.

Box 4.1: Babies eligible for screening

Eligibility criteria for screening varies somewhat between programs. In general, all babies of at least 34 weeks gestation can be screened within hours of birth using automated tests such as AABR. Ideally testing should be completed within one month of birth (corrected age), however babies may be eligible for screening up to either 3 or 6 months of age (corrected age), depending on individual program protocols.

While screening should be offered to all eligible babies, it may not be undertaken or completed for several reasons (Coates & Gifkins 2003, Neonatal Hearing Screening Work Group (NHSWG) 2013, Queensland Health 2020):

- in rare situations a baby may be deemed medically unfit or unsuitable by a treating clinician.
- children at high risk of hearing loss may be referred directly to audiology services without being screened
- informed parental consent is required and parents may choose to decline
- contact with families may be lost. Screening programs take considerable efforts to follow-up with families and minimise loss of contact.

4.1.1 Participation in neonatal hearing screening

This section presents information on the percentage of all eligible Indigenous babies who complete neonatal hearing screening, and the percentage who complete screening within one month of birth. This may be referred to as ‘screening coverage’ or ‘participation in screening’.

Box 4.2: Participation in screening

The *National framework for neonatal hearing screening* (2013) highlights that all parents of newborns should be given the opportunity to participate in a neonatal hearing screen and parents must be provided with appropriate information to give informed consent. The National Framework Target for participation in screening is for at least 97% of eligible babies to complete a hearing screen before one month corrected age (AIHW 2013, Neonatal Hearing Screening Work Group (NHSWG) 2013).

In 2019–20, screening coverage of eligible Indigenous babies was 99% in the Northern Territory’s Top End Health Service, 98% in Western Australia’s public maternity hospitals, 97% in Queensland and 94% in South Australia (Table 4.1). In the same year, Northern Territory’s Central Australian Health Service screening coverage rates for all babies was 96% (Northern Territory Department of Health, unpublished).

Most neonatal hearing screening occurs within one month of birth. In 2019–20, 95% of eligible babies in Queensland completed screening within one month of birth, 94% in Western Australian public maternity hospitals and 82% in South Australia. This information was not available for the Northern Territory screening programs (Table 4.1).

In July 2020, the Victorian Infant Hearing Screening Program started collecting information on the Indigenous status of babies screened. Between July 2020 and February 2021, screening coverage rates for Indigenous babies in Victoria were 97% by one month of birth and 99% for all eligible Indigenous babies (Table 4.1).

Table 4.1: Screening coverage of eligible Indigenous babies by age at screening, number and percent screened

| State/Territory | within one month of birth | total screened ¹ |
|--|---------------------------|-----------------------------|
| July 2019 to June 2020 | | |
| Northern Territory Top End Health Service ² | Not available | 775 (99.5%) |
| Western Australia ³ | 2,116 (93.5%) | 2,208 (97.6%) |
| Queensland | 5,491 (95.2%) | 5,622 (97.4%) |
| South Australia | 905 (82.4%) | 1,032 (94.0%) |
| July 2020 to February 2021 | | |
| Victoria (Jul 20 - Feb 21) ⁴ | 701 (97.1%) | 714 (98.9%) |

Notes:

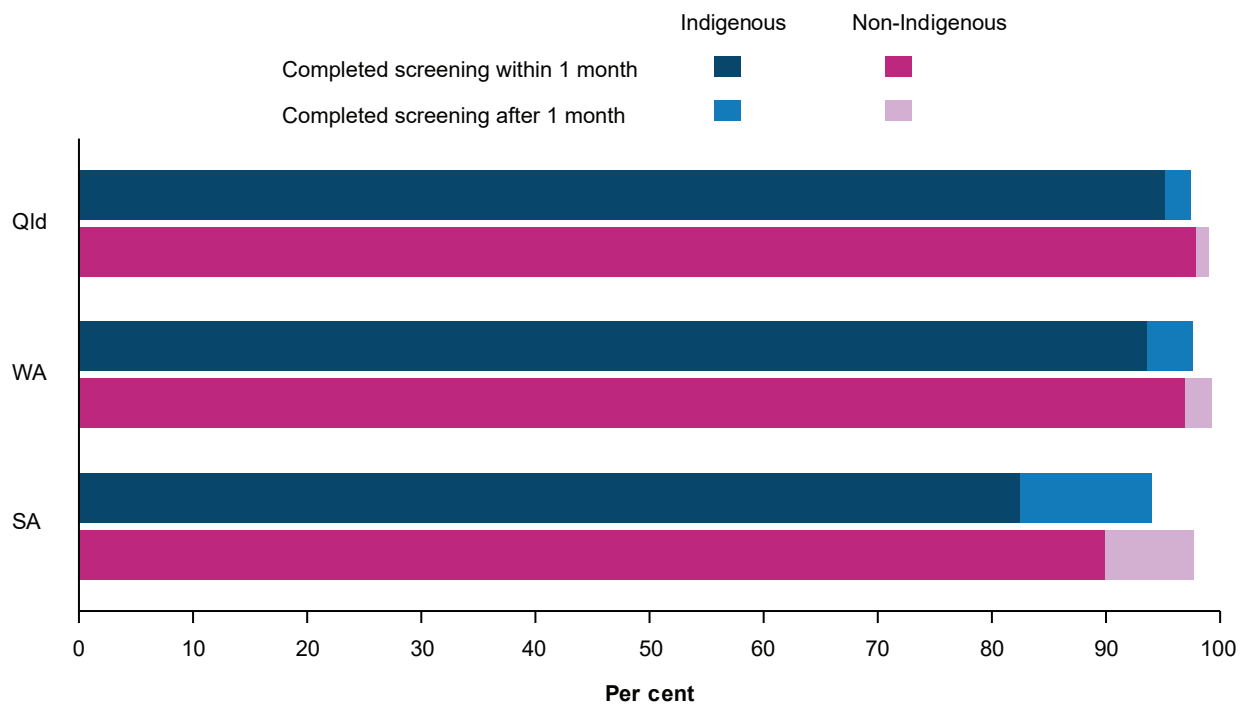
1. The column ‘total screened’ includes babies screened within one month of birth and babies screened after 1 month of birth.
2. The Northern Territory Top End Health Service includes Royal Darwin Hospital, Palmerston Regional Hospital, Katherine Hospital, Gove Hospital, Top End Mental Health Services and numerous remote health clinics.
3. Data for Western Australia are for babies born in public hospitals only.
4. For Victoria, information on Indigenous status was collected from July 2020. Data presented here are from 1 July 2020 to 28 February 2021.

Sources: AIHW analysis of The Royal Children’s Hospital Melbourne data (unpublished); Queensland Health data (unpublished); Western Australia Department of Health data (unpublished); South Australia Women’s and Children’s Health Network data (unpublished); and Northern Territory Department of Health data (unpublished).

Screening coverage was similar for Indigenous babies and non-Indigenous babies. In 2019–20, differences in coverage rates ranged from 0.1 percentage points in the Northern Territory’s Top End Health Service to 4 percentage points in South Australia (Figure 4.1).

Indigenous babies were slightly less likely to be screened within one month of birth than non-Indigenous babies in Queensland (difference of 2.7 percentage points), Western Australian public maternity hospitals (difference of 3.3 percentage points) and South Australia (difference of 7.5 percentage points) (Figure 4.1)

Figure 4.1: Screening coverage of eligible babies by age, state and territory, by Indigenous status, 2019–20



Note: Data for these figures are available in the supplementary tables

Sources: AIHW analysis of Queensland Health data (unpublished); Western Australia Health data (unpublished); and Northern Territory Department of Health data (unpublished).

4.1.2 Referral for audiological assessment

Babies who screen positive for potential permanent hearing impairment on 2 occasions (2-stage screening) are referred to an audiologist for further diagnostic assessment (Section 4.1.3).

This section presents data on the ‘refer rate’, or percentage of babies screened who received a positive or refer screening result.

Box 4.3: Refer rate of the screening test

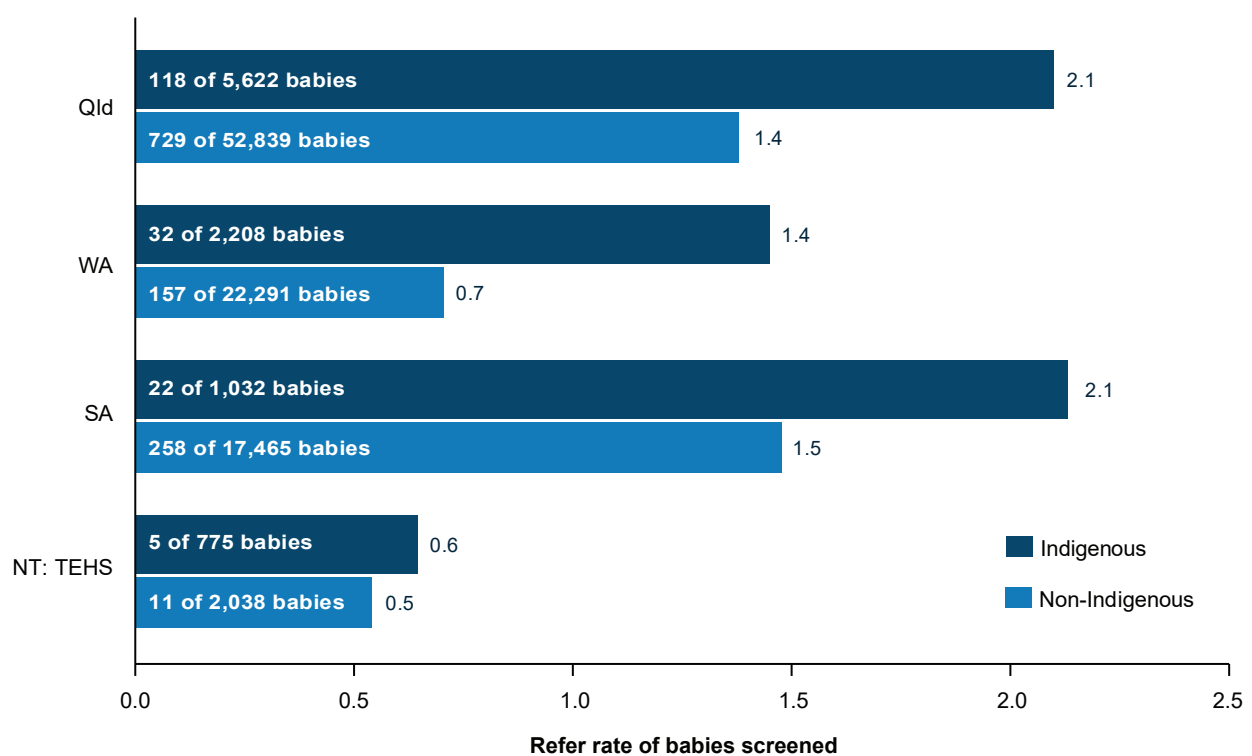
A refer rate of less than 2% is expected using automated auditory brainstem response technology (Neonatal Hearing Screening Work Group (NHSWG) 2013).

In 2019–20, the refer rate for Indigenous babies was 2.1% in Queensland and South Australia, 1.4% in Western Australian public maternity hospitals and 0.6% in the Northern Territory Top End Health Service (Figure 4.2).

In 2019–20, the refer rate for Indigenous babies was 1.5 times the rate among non-Indigenous babies in Queensland and South Australia, 2 times the rate in Western Australia, and similar in the Northern Territory Top End Health Service and the Northern Territory Central Health Service screening programs (Figure 4.2; Northern Territory Department of Health, unpublished).

In Victoria, from July 2020 to February 2021, the refer rate was 2.2% (16 babies) for Indigenous babies and 0.8% (396 babies) among other Australian babies (including babies where Indigenous status was unknown) (The Royal Children’s Hospital Melbourne, unpublished).

Figure 4.2: Refer rate of screening, by state and territory and Indigenous status, 2019–20



Notes:

1. Data for these figures are available in the supplementary tables.
2. TEHS = Top End Health Service.

Sources: AIHW analysis of Queensland Health data (unpublished); Western Australia Health data (unpublished); South Australia Women’s and Children’s Health Network data (unpublished); and Northern Territory Department of Health data (unpublished).

4.1.3 Diagnosis

Following a positive screening, an audiological diagnostic assessment establishes whether a baby has a definitive diagnosis of permanent childhood hearing impairment, other hearing or ear conditions, or functionally normal hearing. Babies diagnosed with hearing loss are referred for medical investigation and intervention services. Babies with functionally normal hearing and no known risk factors complete their neonatal hearing screening at this point.

Although the target condition for audiological assessment is bilateral permanent moderate to profound hearing loss, an assessment may also diagnose some cases of unilateral, mild, and transient conductive hearing loss following screening.

This section provides diagnostic information for babies referred for audiological assessment following screening.

Box 4.4: Detection rate

It is expected that bilateral permanent childhood hearing impairment occurs in around 1.3 per 1,000 babies (Neonatal Hearing Screening Work Group (NHSWG) 2013).

Results of diagnostic assessments for babies who participated in neonatal hearing screening are available for Queensland, South Australia and the Northern Territory and Victoria.

Of Indigenous babies participating in screening from July 2018 to June 2020, a diagnosis of permanent childhood hearing impairment was received for (Figure 4.3):

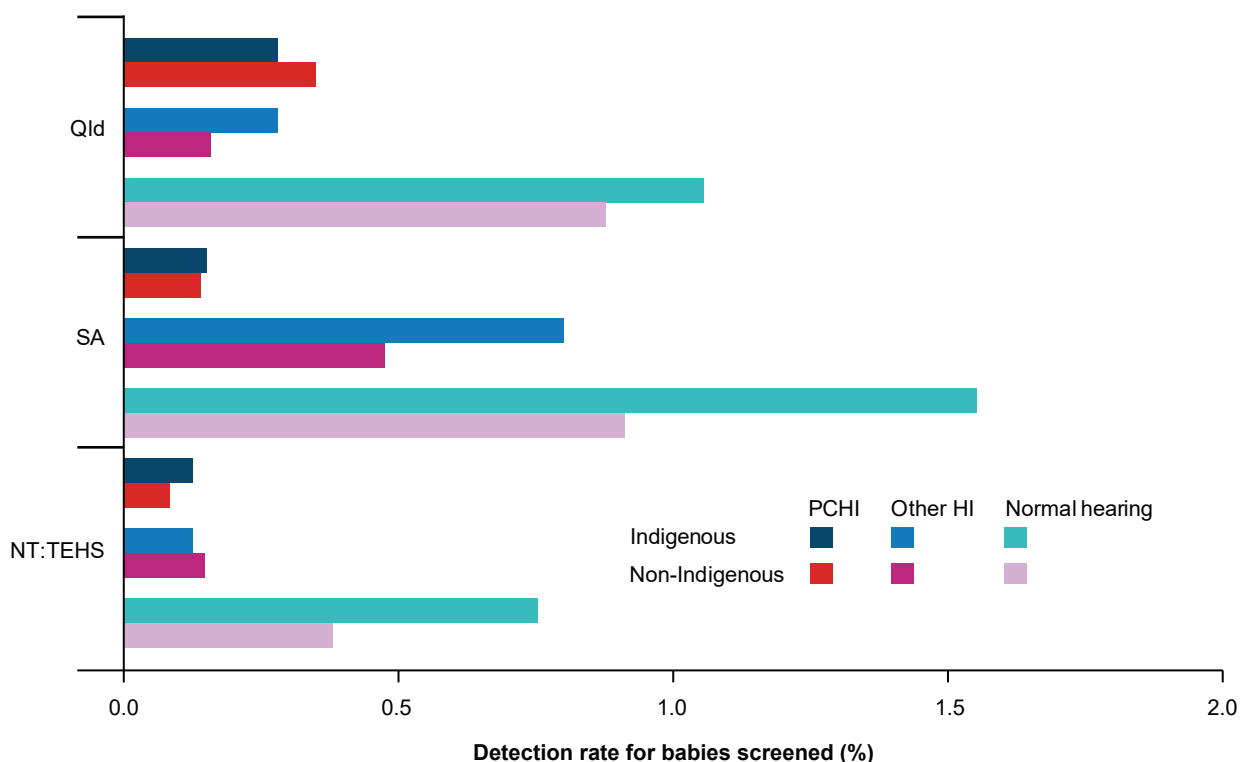
- 31 babies (0.3%) in Queensland
- 3 babies (0.3%) in South Australia
- 3 babies (0.1%) in the Northern Territory Top End Health Service
- 2 babies (% unavailable) in the Northern Territory Central Australian Health Services.

Of Indigenous babies screened in Victoria between July 2020 and February 2021, a diagnosis of permanent childhood hearing impairment was received for 5 babies (0.7%) (The Royal Children's Hospital Melbourne, unpublished).

Of Indigenous babies screened in 2018–20 (Figure 4.3):

- in most jurisdictions the rate of diagnosis for permanent childhood hearing impairment was similar among Indigenous and non-Indigenous babies referred for audiological assessments following screening
- the proportion referred and who were ultimately diagnosed with functionally normal hearing was higher than for non-Indigenous babies who completed screening in Queensland, South Australia and the Northern Territory Top End Health Service
- the proportion referred who were diagnosed with 'other hearing impairment' was also higher than for non-Indigenous babies who completed screening in Queensland and South Australia.

Figure 4.3: Diagnosis outcomes among babies who participated in screening, by state or territory, Indigenous status and diagnosis, 2018–20



Note:

1. Data for these figures are available in the supplementary tables.

2. PCHI = Permanent childhood hearing impairment (bilateral moderate to profound); Other HI = Hearing impairment, other than PCHI; TEHS = Top End Health Service.

Sources: AIHW analysis of Queensland Health data (unpublished); South Australia Women’s and Children’s Health Network data (unpublished); and Northern Territory Department of Health data (unpublished).

4.2 Indigenous-specific health checks

Indigenous Australians of all ages are eligible for an annual Indigenous-specific health check subsidised by Medicare. This is free at all Aboriginal Medical Services and bulk billing practices. The health check also provides access to follow-up services, including hearing services, and helps manage chronic health conditions.

For Indigenous children and adults aged under 55, the health check must include an ear and hearing examination. This includes an otoscopy – inspection of the outer and middle ear for signs of inflammation, discharge, infection or other issues using an otoscope. For Indigenous Australians aged 55 and over, the health check does not explicitly require an ear examination. However, an ear and hearing check including an ear examination with otoscopy is recommended for all age groups (RACGP 2021, Appendix D).

Many Indigenous Australians would have had their ear or hearing checked outside Indigenous-specific health checks. As such, the number of Indigenous Australians receiving such a check provides estimates of the minimum number of Indigenous Australians who have had their ears or hearing checked at least once during a year.

Box 4.5: Medicare Benefits Schedule items for Indigenous-specific health checks

These Indigenous-specific health checks are listed on the MBS:

- MBS item 715 – available from 1 May 2010, provided by GPs
- MBS item 228 – available from 1 July 2018, provided by non-vocationally recognised medical practitioners.

Since March 2020, in response to the COVID-19 pandemic, temporary telehealth items for Indigenous-specific health checks have been available by videoconference or teleconference (MBS items 92004, 92011, 92016, 92023). From December 2020, 2 additional temporary MBS items for face-to-face Indigenous-specific health checks were made available to care recipients in residential aged care facilities (MBS items 93470 and 93479).

While many required aspects of an Indigenous-specific health check can be completed as a remote service through telehealth, some can only be delivered through face-to-face consultation with the patient. This includes necessary physical examinations such as an ear examination with otoscopy. For an Indigenous health check undertaken by telehealth to be processed through Medicare, all components of the check, including remotely delivered and face-to-face, must be completed.

Sources: Department of Health 2020a and Department of Health 2020b.

Overall: In 2020–21, one in 4 (236,000 or 27%) Indigenous Australians had an Indigenous-specific health check. This included about 12,100 health assessments provided by videoconference or teleconference between July 2020 and June 2021 (Services Australia 2021).

Age: In 2020–21, the proportion of Indigenous Australians receiving a health check generally increased with age. The proportion of Indigenous Australians who had a health check was highest among people aged 65 and over (18,000 or 40%). It was lowest among Indigenous Australians aged 15–24 (36,300 or 22%) (Figure 4.4a).

Sex: In 2020–21, Indigenous females aged 15 and over were more likely than Indigenous males of the same age to have had a health check (29% and 25% respectively). However, for Indigenous children aged 0–14, the number and proportion of males that received a health check (38,800 or 27%) was slightly higher than for females and (34,200 or 25%) (Figure 4.4a).

Remoteness area: In 2020–21, the proportion of Indigenous Australians who had a health check was highest in *Outer regional* and *Remote* areas (33% in each). Rates were lower in *Inner regional* areas (26%), *Very remote* areas (25%) and *Major cities* (24%) (Figure 4.4b).

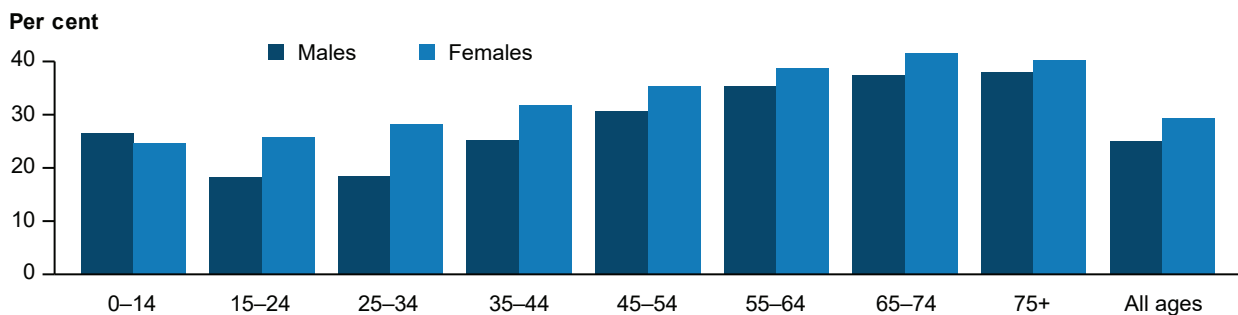
State/territory: In 2020–21, the proportion of Indigenous Australians who had a health check was highest in Queensland (34%) and the Northern Territory (32%) and lowest in Victoria (14%) (Figure 4.4c).

Time trend: For Indigenous children aged 0–14 the proportion who had a health check increased from 8.5% in 2010–11 to 28% in 2018–19. Since then, the proportion has dropped slightly, with 26% receiving a health check in 2020–21. The trend was very similar for Indigenous Australians aged 15–54. For those aged 55 and over the proportion rose from 17% in 2010–11 to 38% in 2018–19 and remained at 38% to 2020–21 (Figure 4.4d).

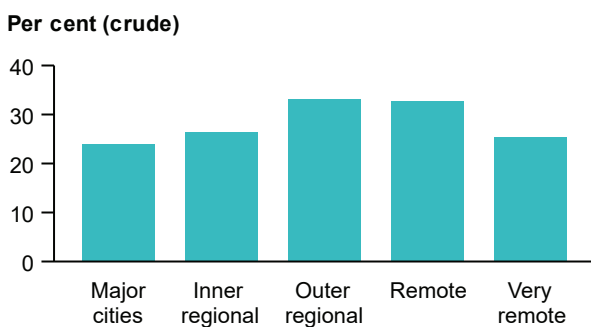
Between 2010–11 and 2020–21, the proportion of Indigenous Australians who had an Indigenous-specific health check grew each year. It was 10% in 2010–11 and plateaued at around 28% from 2017–18 to 2019–20, dropping to 27% in 2020–21 (Figure 4.4e).

Figure 4.4: Indigenous-specific health checks, by selected characteristics

a) By age and sex, 2020–21



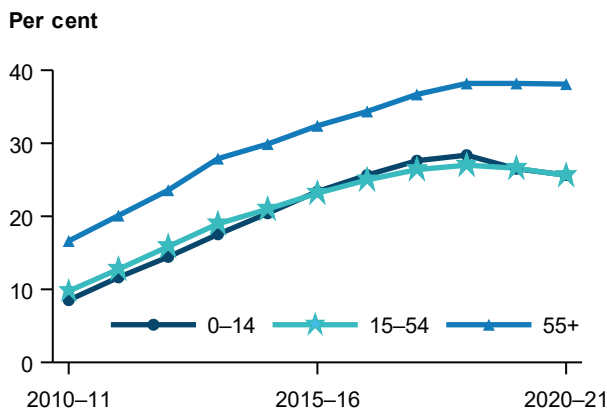
b) By remoteness area, 2020–21



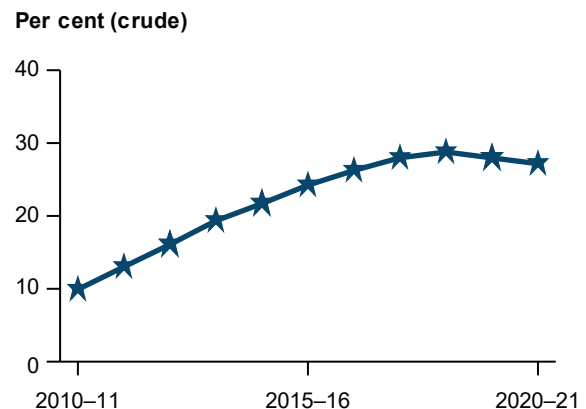
c) By state/territory, 2020–21



d) Time trend by age, 2010–11 to 2020–21



e) Time trend, 2010–11 to 2020–21



Notes:

1. 2019–20 and 2020–20 include telehealth assessments.
2. Data for these figures are available in the supplementary tables.

Source: AIHW analysis of MBS data.

4.3 Audiology services

Audiology services are needed to diagnose, treat and manage a range of ear and hearing conditions. Audiologists are qualified and trained to conduct these services. Medical practitioners may also conduct diagnostic audiology tests. This section looks at the number of Indigenous Australians receiving Medicare subsidised audiology services conducted by an audiologist or medical practitioner. Data in this section comes from MBS data.

Box 4.6: Medical Benefits Schedule items for audiology services

Under Medicare, a number of clinical pathways are available for patients to access audiology services for an identified ear or hearing issue. These include services provided by an audiologist for:

- Indigenous Australians who have had an Indigenous-specific health check (MBS item 81310)
- people with a chronic or terminal medical condition and complex care needs (MBS item 10952)
- children with autism, pervasive development disorder or an eligible disability for assessment or treatment services (MBS items 82030 and 82035, excluded from analysis in this section as these items also cover optometry, orthoptic or physiotherapy services)
- audiology diagnostic tests at the referral of an ENT specialist (MBS items 82300 to 82332), neurologist or consulting physician (MBS items 82309 to 82332)
- audiology diagnostic tests at the referral of a medical practitioner, or provided by a medical practitioner (MBS items 11300 to 11339, excluding MBS item 11304 which must be performed by a medical practitioner).

These services are not for hearing screening and are separate from services provided under the Australian Government Hearing Services Program (Section 5.2 and Appendix C).

Indigenous Australians can voluntarily identify as being Aboriginal and/or Torres Strait Islander to Medicare, Services Australia. This information is recorded on the Medicare database through the Voluntary Indigenous Identifier. Not all Indigenous Australians choose to identify themselves in this way, so MBS data on audiology services (excluding MBS item 81310) have been adjusted to reflect the size of the Indigenous Australian population. MBS item 81310 (along with the Indigenous-specific health check items) is not adjusted in this way, as only Indigenous Australians are eligible to receive these follow ups.

Overall: In 2019–20, 7,400 (8.7 per 1,000 population) Indigenous Australians received a total of 13,900 audiology services. This includes 1,200 who received 1,300 audiology follow-up services after an Indigenous-specific health check (AIHW 2021d).

After adjusting for differences in age structure between the 2 populations, Indigenous Australians received at least one audiology service in 2019–20 at a slightly lower rate than non-Indigenous Australians (7.7 per 1,000 population compared with 8.8 per 1,000 population).

Age: Audiology service rates were highest among Indigenous children aged 0–14 (4,600 children, 16 per 1,000 population). This was at least double the rate for all other age groups. However, rates for Indigenous children aged 0–14 were lower than for non-Indigenous children aged 0–14 (difference of 2.9 per 1,000 population). The largest difference in rates between Indigenous and non-Indigenous Australians was for those aged 65 and over (difference of 4.5 per 1,000 population) (Figure 4.5a).

Sex: Indigenous males and females received at least one audiology service at a similar rate (9.1 and 8.4 per 1,000 population respectively).

Remoteness area: Audiology service rates were similar for usual residents of *Outer regional*, *Remote* and *Very remote* areas (5.7, 7.1 and 5.7 per 1,000 population respectively). Rates were higher for usual residents of *Major cities* and *Inner regional* areas (9.3 and 12 per 1,000 population respectively) (Figure 4.5b).

State/territory: Audiology service rates were highest for usual residents of Queensland (14 per 1,000 population) and Victoria (13 per 1,000 population), and lowest among usual residents of Western Australia (3.0 per 1,000 population) (Figure 4.5c).

Time trend: Among Indigenous Australians, audiology service rates increased from 6.4 per 1,000 population in 2010–11 to 10 per 1,000 population in 2014–15. Since then, the rate decreased to 8.7 per 1,000 population in 2019–20.

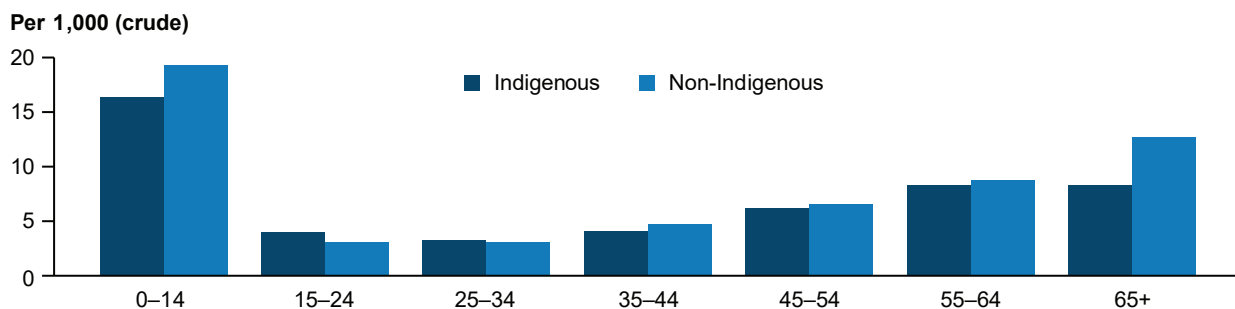
This pattern was driven by audiology service rates among children aged 5–9, which increased from 16 per 1,000 population in 2010–11 to 25 per 1,000 population in 2014–15, then decreased to 19 per 1,000 in 2019–20 (Figure 4.5d).

Among children aged 0–4, audiology service rates increased from 11 per 1,000 population in 2010–11 to 19 per 1,000 population in 2019–20.

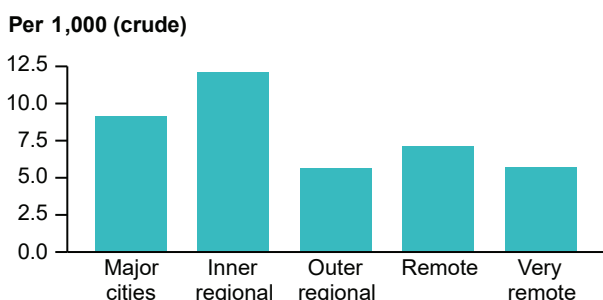
Between 2010–11 and 2018–19, audiology service rates among non-Indigenous Australians remained relatively steady (10 per 1,000 population), before declining slightly to 8.9 per 1,000 population in 2019–20 (Figure 4.5e). This led to a decreased gap in audiology service rates over this period.

Figure 4.5: Audiology services, by selected characteristics

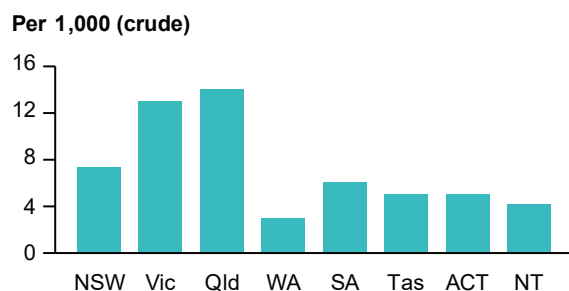
a) By age and Indigenous status, 2019–20



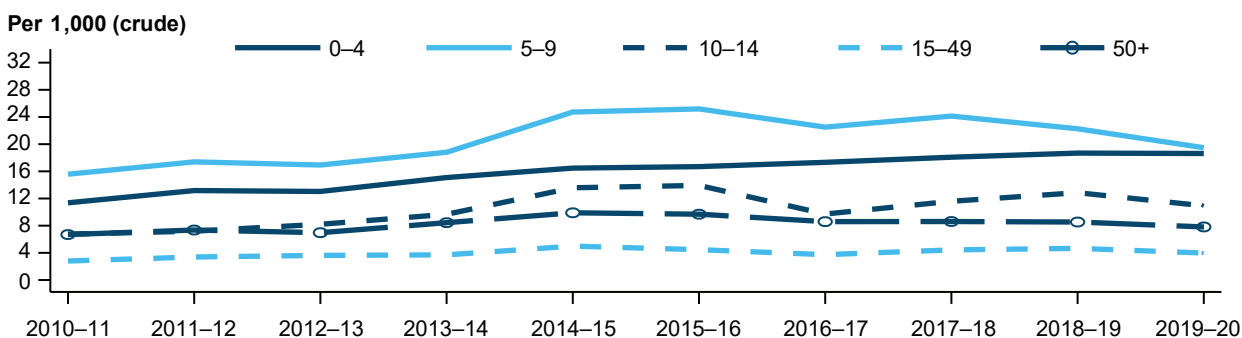
b) Indigenous, by remoteness area, 2019–20



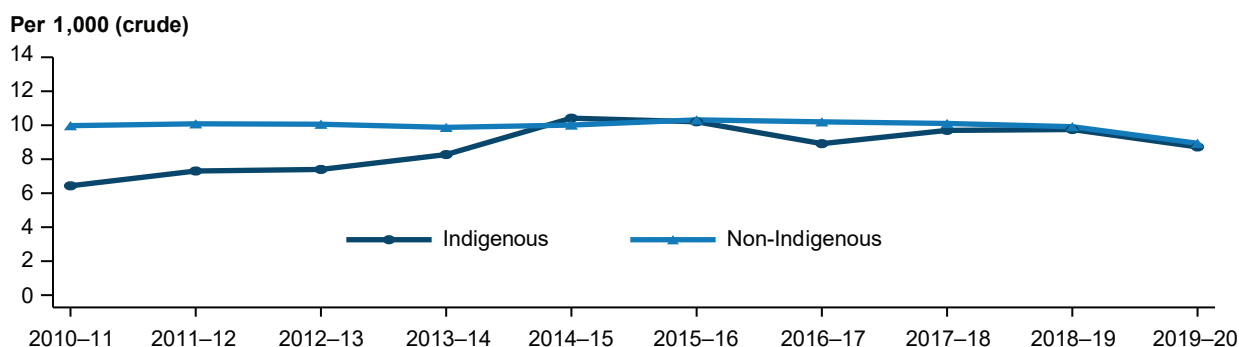
c) Indigenous, by state/territory, 2019–20



d) Indigenous, by age, 2010–11 to 2019–20



e) By Indigenous status, 2010–11 to 2019–20



Notes:

- Includes MBS items 10952, 11300, 11303, 11304, 11306, 11309, 11312, 11315, 11318, 11324, 11327, 11330, 11332, 11333, 11336, 11339, 81310, 82300, 82306, 82309, 82312, 82315, 82318, 82324, 82327 and 82332.
- Data from the MBS Voluntary Indigenous Identifier (VII) database have been adjusted to reflect the size of the Indigenous Australian population.
- Data are based on date of processing.
- Data for these figures are available in the supplementary tables.

Source: AIHW analysis of MBS data.

4.4 Emergency department presentations

People may present at an emergency department for ear disease and associated symptoms due to severe ear disease or because of lack of access to, or awareness of, primary health-care services. In areas where access to primary health-care services is low, people are more likely to present. Supporting public awareness of ear and hearing health and targeted primary health services in these areas helps to reduce lower urgency presentations (Box 4.7). However, presentation provides an opportunity to screen patients for ear and hearing problems and refer patients with ear or hearing problems for care and treatment.

Box 4.7: Use of emergency departments for lower urgency care

Emergency departments are a vital part of Australia's health-care system. They provide care for people who require urgent, and often life-saving, medical attention. However, many people present for health conditions that may be managed more appropriately and effectively in a different health-care setting, such as through a GP or community walk-in clinic.

This is more likely the case in regional areas or after-hours. Close to half of all lower urgency emergency department presentations were children and young people aged under 25 (AIHW 2020d).

Indigenous Australians presenting at emergency departments may suffer traumatic adverse experiences and implicit racial bias when seeking treatment. This may affect outcomes and increase distrust of medical professionals (Quigley et al. 2021)

This section looks at emergency department presentations by Indigenous Australians with a principal diagnosis of ear or hearing-related problems (Box 4.8).

Box 4.8 Types of ear or hearing-related principal diagnosis

Ear or hearing-related emergency department presentations in this section are defined as presentations to public hospitals with a principal diagnosis of Diseases of the ear and mastoid process (International Classification of Disease, 10th edition, Australian modification). Ear or hearing-related diagnoses are divided into diagnosis groups based on the part of the ear affected and type of condition. The groups are:

Otitis externa. This inflammatory condition of the external ear canal is sometimes known as swimmer's ear. It is commonly caused by a bacterial or fungal infection, but can be caused by dermatological conditions such as eczema, psoriasis, dermatitis and acne.

Other disorders of the external ear. This includes other disorders affecting the outer ear, such as a build-up of wax, stenosis (narrowing) of the external ear canal, deformities of the external ear, and other infections of the external ear.

Diseases of the middle ear and mastoid ('middle ear'). This includes all conditions affecting the middle ear and mastoid. The most common is otitis media, a bacterial or viral middle ear infection. Other conditions include: perforations of the tympanic membrane; cholesteatoma, a pocket of skin growth in the middle ear; mastoiditis, a bacterial infection of the mastoid air cells at the back of the ear often caused by untreated middle ear infections; and Eustachian salpingitis, a blockage of the Eustachian tube due to an infection.

Diseases of the inner ear. This includes otosclerosis, an abnormal bone growth that affects the 3 small bones connected to the ear drum. It causes: progressive hearing loss; disorders of vestibular function, which affect balance and spatial orientation; and other diseases of the inner ear.

Hearing loss. This includes conductive, sensorineural and other forms of hearing loss.

Other ear conditions. This includes all other conditions affecting the ear and hearing, such as ear pain and swelling, disorders of the ear related to surgery, and any other disorders of the ear.

Overall: From July 2018 to June 2020, 18,100 emergency department presentations were made by Indigenous Australians with a principal diagnosis of ear or hearing-related problems (11 per 1,000 population). The age-standardised rate of ear or hearing-related emergency department presentations was more than twice the rate among Indigenous Australians than non-Indigenous Australians.

Age: Indigenous children aged 0–14 had almost twice the rate of ear or hearing-related emergency department presentations compared with any other age group (17 per 1,000 population). The rate in all other age groups was between 5.6 and 8.4 per 1,000 population (Figure 4.6a). The rate of ear or hearing-related emergency department presentations was 2.6 times the rate among Indigenous children aged 0–14 than non-Indigenous children of the same age. More information on emergency department presentations among children: Section 7.3.

Sex: Overall, the rate of ear or hearing-related emergency department presentations was higher for Indigenous females than Indigenous males (12 per 1,000 population compared with 9.7 per 1,000 population respectively) (Figure 4.6b).

Remoteness area: The rate of ear or hearing-related emergency department presentations was lowest among Indigenous Australians living in *Major cities* (5.5 per 1,000 population) and highest for Indigenous Australians living in *Remote* areas (26 per 1,000 population) (Figure 4.6c).

State/territory: The highest rate of ear or hearing-related emergency department presentations by Indigenous Australians was in Western Australia (19 per 1,000 population), followed by the Northern Territory (15 per 1,000 population) and New South Wales (13 per 1,000 population) (Figure 4.6d).

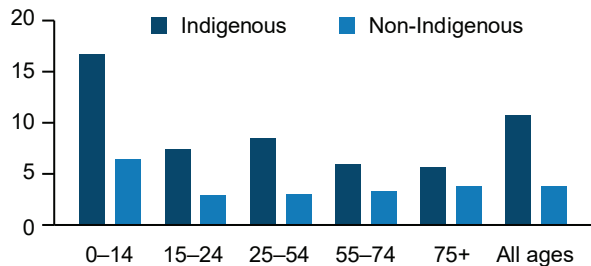
Time trend: Since 2013–14, the rate of ear or hearing-related emergency department presentations by Indigenous Australians (all ages) increased from 7.4 per 1,000 population to 11 per 1,000 population in 2019–20. An increase in presentations was seen among children aged 0–4 and 5–14 and among Indigenous Australians aged 15 and over between 2013–14 and 2019–20.

Between 2013–14 and 2019–20, the presentation rate for non-Indigenous Australians remained steady at around 3.7 per 1,000 population. The gap in emergency department presentation rates between Indigenous Australians and non-Indigenous Australians increased over this period (Figure 4.6e).

Figure 4.6: Emergency department presentations for ear or hearing problems, by selected characteristics

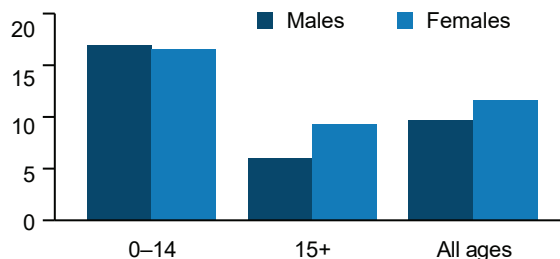
a) Presentations, by Indigenous status, by age, 2018–20

Per 1,000 (crude)



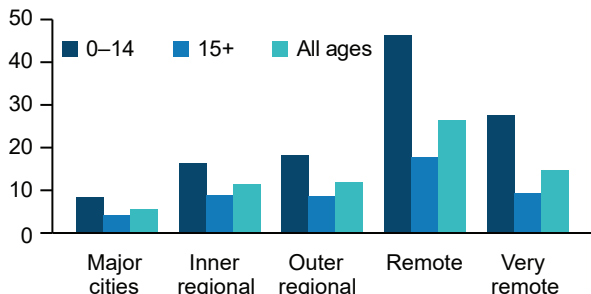
b) Indigenous, by age and sex, 2018–20

Per 1,000 (crude)



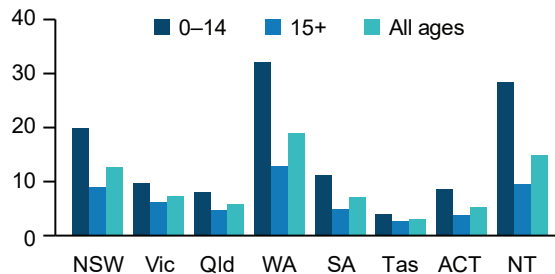
c) Indigenous, by remoteness area and age, 2018–20

Per 1,000 (crude)



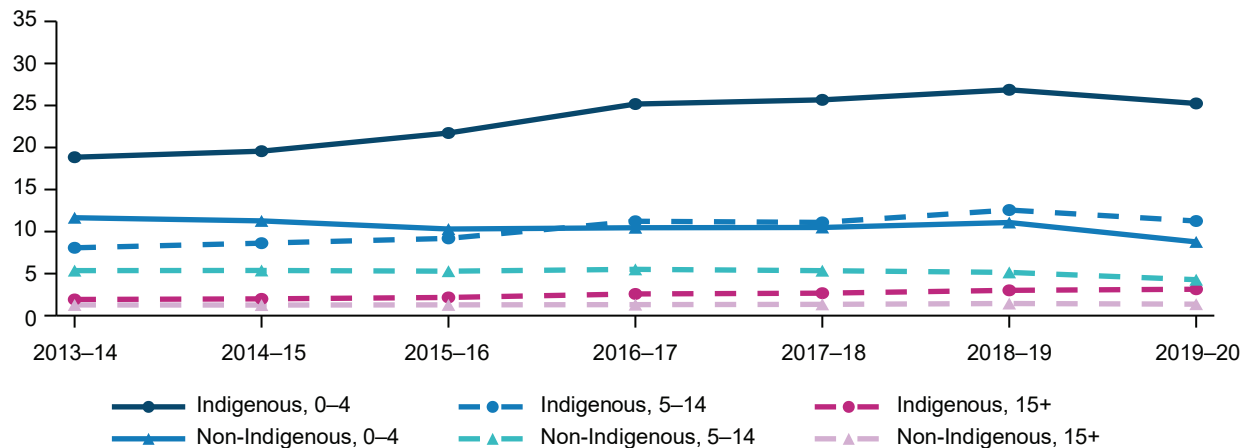
d) Indigenous, by state/territory and age, 2018–20

Per 1,000 (crude)



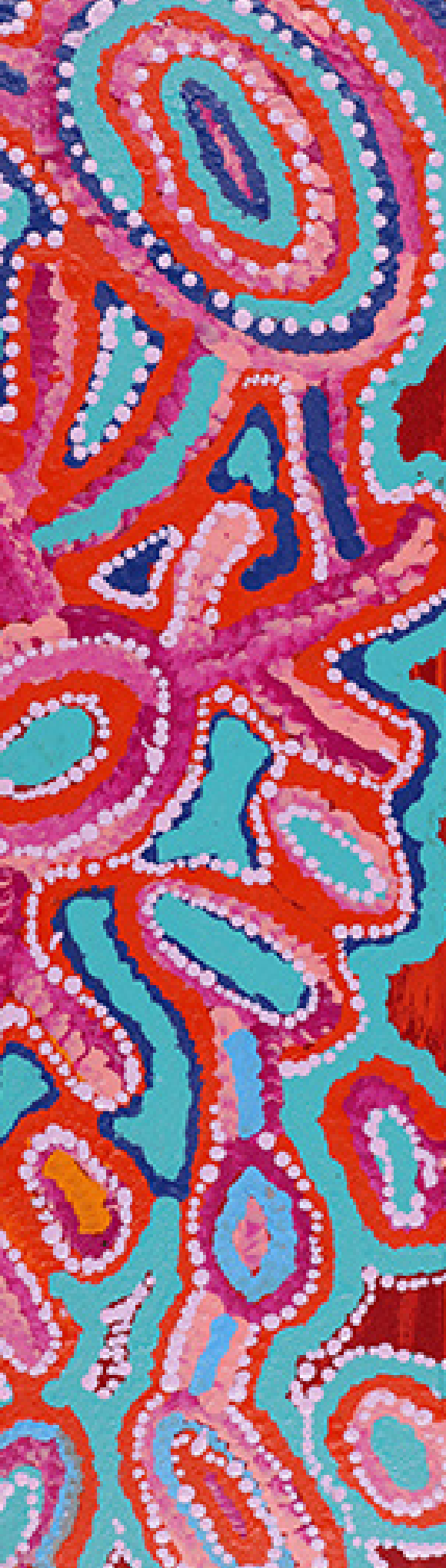
e) Time trend, by Indigenous status and age, 2013–14 to 2019–20

Per 1,000 (crude)



Note: Data for these figures are available in the online supplementary tables.

Source: AIHW National Non-admitted Patient Emergency Department Care Database.



5



Treatment and rehabilitation

5 Treatment and rehabilitation



What do we know?

The timely provision of treatment and rehabilitation services can minimise the impact of ear disease and hearing loss.

The provision of treatment and rehabilitation services

Hospitalisation is an important way of treating severe ear disease and hearing loss, including surgical procedures. Between July 2018 and June 2020:

- Almost 7,000 hospitalisations took place for Aboriginal and Torres Strait Islander people with a principal diagnosis of ear or hearing problems (4.1 per 1,000 population).
- The rate of ear or hearing-related hospitalisations among Indigenous Australians was 1.4 times the rate among non-Indigenous Australians (after adjusting for age differences between the 2 populations).
- Rates were highest among Indigenous children aged 0–14 living in *Remote* and *Very remote* areas (11 and 13 per 1,000 population respectively).
- 5000 more hospitalisations for Indigenous Australians had an additional diagnosis of ear or hearing-related problems, which may have affected patient treatment or length of stay. For Indigenous children aged 0–14, the hospitalisation rate with a principal or additional diagnosis of ear or hearing-related problems was 13 per 1,000 population.
- Indigenous Australians had 8,500 ear or hearing-related procedures in hospital (5.0 per 1,000 population), the most common myringotomy (4,500 procedures, 2.7 per 1,000 population). Indigenous children aged 0–14 accounted for 77% (6,500) of all ear or hearing-related hospital procedures by Indigenous Australians.
- 1,600 patients were admitted for myringotomy surgery from public hospital waiting lists. Half waited at least 75 days for admission). In comparison, half of the non-Indigenous Australians myringotomy patients waited 62 days to be admitted.

Rehabilitation services may include fitting of hearing aids and cochlear implants, provision of assistive devices, audiology services and other allied health services.

- As at 31 December 2019, 6,900 Indigenous Australians were Hearing Australia clients fitted with a hearing aid or cochlear implant (8.1 per 1,000 population).
- As at 30 June 2020, 1,700 Indigenous Australians were active participants in the NDIS and reported hearing impairment as a disability (5.3% of the 32,400 Indigenous Australian NDIS participants). Almost 2 in 3 Indigenous Australian NDIS participants with hearing impairment lived in Victoria (32%) or New South Wales (31%).

Most ear and hearing problems experienced by Indigenous Australians are amenable to treatment or can be mitigated through rehabilitation. Measuring the frequency and type of treatment and rehabilitation services provides insight into the treatment pathway and potential barriers to receiving treatment and support services. It also gives an indication of costs associated with ear and hearing-related health services and can be used to better target health services in areas of greatest need.

Common treatments and rehabilitation services include:

- antibiotics
- cleaning ears and removing wax build up
- surgical procedures (such as the insertion of grommets)
- hearing aids and cochlear implants
- audiology-related counselling
- speech and occupational therapy.

Rehabilitation can be assisted by a hearing inclusive environment. This includes the availability of hearing loops in public spaces, acoustically appropriate spaces, widespread use of Auslan and other interpreting services, availability of closed captioning, and efforts to reduce hearing loss stigma and discrimination.

Information in this section comes from 4 sources:

- National Hospital Morbidity Database (NHMD)
- National Elective Surgery Waiting Times Data Collection
- Hearing Australia
- National Disability Insurance Scheme (NDIS).

5.1 Hospital admissions

5.1.1 Hospitalisations for diseases of the ear and mastoid process

People hospitalised for ear disease generally have more severe ear disease or are hospitalised for a procedure. For reporting purposes, the reason for hospitalisation is categorised on the part of the ear affected and the type of condition (Box 4.8).

Overall: From July 2018 to June 2020, almost 7,000 (4.1 per 1,000 population) hospitalisations were for Indigenous Australians with an ear or hearing-related principal diagnosis. The overall age-standardised rate of ear or hearing-related hospitalisations was 1.4 times the rate among Indigenous Australians than non-Indigenous Australians (3.6 and 2.7 per 1,000 population respectively).

Diagnosis: The most common reason for ear or hearing-related hospitalisations for Indigenous Australians was middle ear diseases (5,100 hospitalisations, or 3.0 per 1,000 population). This was 73% of all ear or hearing-related hospitalisations. Age-standardised hospitalisation rates among Indigenous Australians for:

- middle ear disease were 1.5 times the rate among non-Indigenous Australians
- otitis externa were 2.6 times the rate among non-Indigenous Australians.
- inner ear and hearing loss conditions were similar to rates among non-Indigenous Australians (Figure 5.1b).

Age: Indigenous children aged 0–14 had the largest number and highest rate of ear or hearing-related hospitalisations (4,500, or 8.1 per 1,000 population) of any age group (Figure 5.1a). Among Indigenous children aged 0–14, 9 in 10 (89%) ear or hearing-related hospitalisations were for middle ear diseases (4,000 hospitalisations). More information on hospital admissions among children aged 0–14, including rates by 5-year age groups and trends over time: Section 7.4 Hospital admissions.

For Indigenous Australians aged 15 and over, hospitalisation rates increased with age. They were lowest for people aged 15–24 and highest for people aged 75 and over (1.3 and 5.3 per 1,000 population respectively, Figure 5.1a). The main reason for ear or hearing-related hospitalisations among Indigenous adults aged 15–54 was middle ear conditions. The main reason for Indigenous adults aged 55 and over was inner ear conditions.

Sex: Rates of ear or hearing-related hospitalisations were similar for Indigenous males and females (4.2 and 4.0 per 1,000 population respectively).

Remoteness area: Among Indigenous Australians, the rates of ear or hearing-related hospitalisations for usual residents of *Very remote* or *Remote* areas (6.0 and 5.1 per 1,000 population respectively) were higher than for usual residents of *Major cities*, *Inner regional* or *Outer regional* areas (3.9, 3.7 and 3.4 per 1,000 population respectively). Hospitalisation rates were highest among Indigenous children aged 0–14 living in *Remote* and *Very remote* areas (11 and 13 per 1,000 population respectively) (Figure 5.1c).

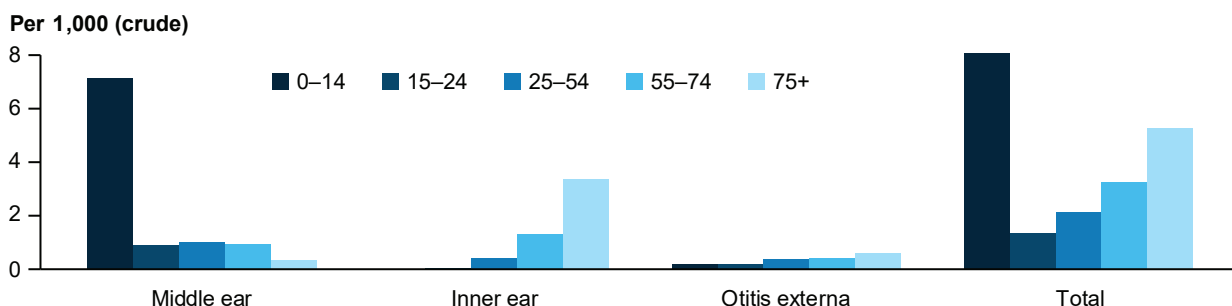
State and territory: The rate of ear or hearing-related hospitalisations among Indigenous Australians was highest for usual residents of the Northern Territory, Western Australia and Queensland (5.1, 4.9 and 4.7 per 1,000 population respectively). Rates were lowest for usual residents of Tasmania (2.4 per 1,000 population) (Figure 5.1d).

Time trend: For Indigenous children aged 0–14, the rate of ear or hearing-related hospitalisations increased from 2010–11 to 2017–18 (6.9 to 9.2 per 1,000 population respectively), then decreased in 2019–20 (7.4 per 1,000 population) (Figure 5.1e). For non-Indigenous children aged 0–14, rates declined from 2010–11 to 2019–20 (7.7 to 5.3 per 1,000 population respectively). This led to an increased gap in rates between Indigenous and non-Indigenous children aged 0–14 between 2014–15 and 2019–20 (rate ratios of 0.9 and 1.4 respectively).

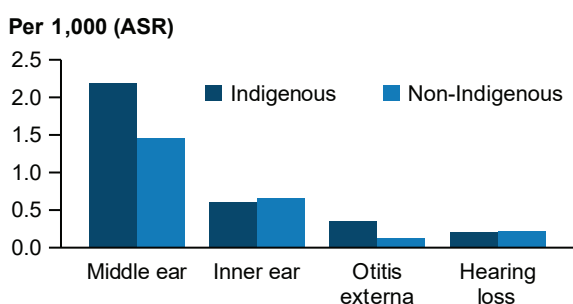
For Indigenous Australians aged 15 and over, the rate of ear or hearing-related hospitalisations increased slightly from 2010–11 to 2019–20 (1.5 to 2.1 per 1,000 population respectively). Rates were similar among non-Indigenous Australians aged 15 and over, increasing slightly from 2010–11 to 2019–20 (1.5 to 1.9 per 1,000 population respectively).

Figure 5.1: Hospitalisation rates for ear or hearing-related conditions, by selected characteristics

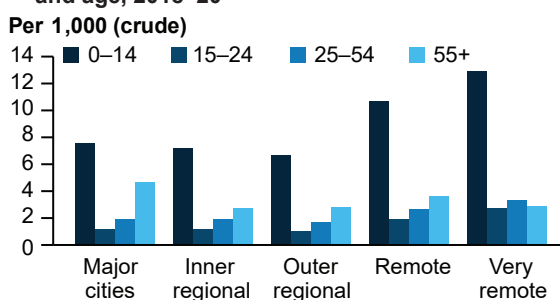
a) Indigenous Australians, by diagnosis and age, 2018–20



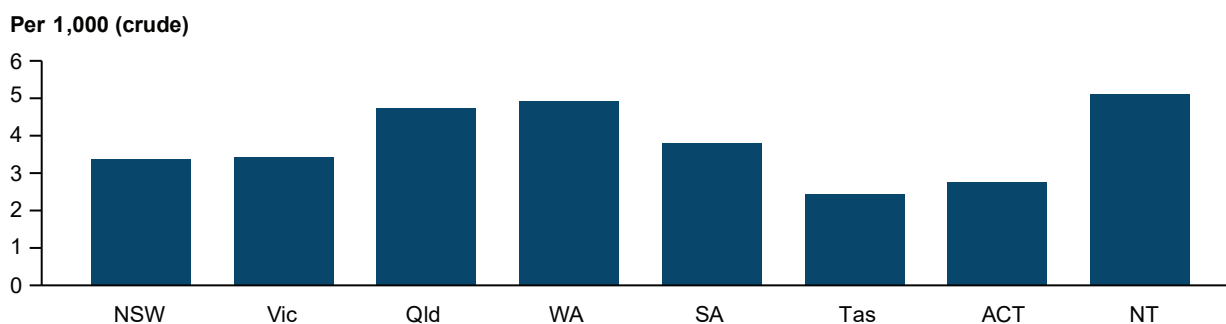
b) By diagnosis and Indigenous status, 2018–20



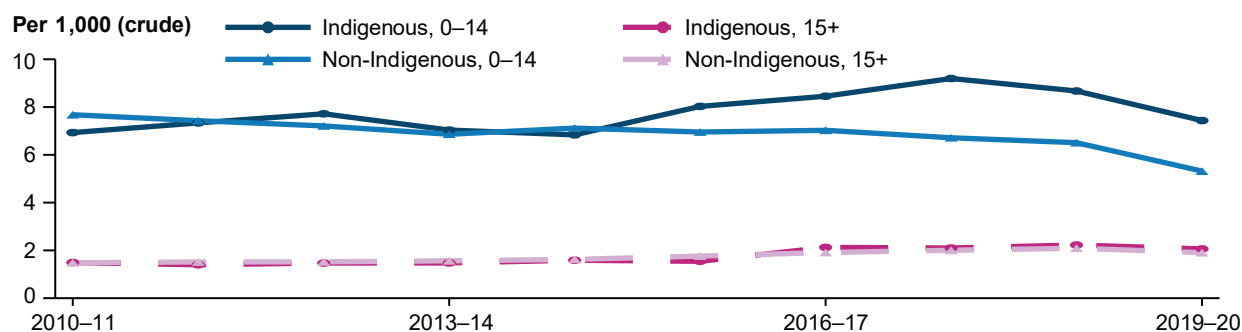
c) Indigenous Australians, by remoteness area and age, 2018–20



d) Indigenous Australians, by state/territory, 2018–20



e) By Indigenous status, 2010–11 to 2019–20



Notes:

- Hospitalisations are categorised based on principal diagnosis.
- Age-standardised rates (ASR) are in figure (b).
- Figures (a) and (b) show the top 3 and 4 principal diagnoses for Indigenous Australians respectively.
- Figure (c) data for age 75+ in Remote and Very remote areas have been suppressed for confidentiality purposes.
- Data for these figures are available in the online supplementary tables.

Source: AIHW NHMD.

Principal diagnosis and additional diagnoses

In hospital, each patient is assigned one principal diagnosis representing the main condition they were hospitalised for. This is assessed by the person's doctors upon discharge. A patient can also be assigned one or more additional diagnoses, documenting co-occurring conditions that contributed to admission, conditions that developed during the hospital stay, or pre-existing conditions that impacted treatment or the length of stay.

Box 5.1: Principal, additional and any diagnosis

principal diagnosis: the diagnosis mainly responsible for the hospitalisation, which is determined at the conclusion of the patient's hospital stay.

additional diagnosis: a condition or recording of a complaint – either coexisting with the principal diagnosis or arising during the hospitalisation – that requires or affects the provision of care.

any diagnosis: diagnosis based on both principal diagnosis and additional diagnosis.

This section compares ear and hearing-related hospitalisations identified using principal diagnosis (as in Section 5.1.1) and both principal and additional diagnosis (referred to as 'any diagnosis').

Overall: From July 2018 to June 2020, the rate of ear or hearing-related hospitalisations among Indigenous Australians based on any diagnosis was 1.7 times the rate for principal diagnosis (7.0 and 4.1 per 1,000 population respectively). This equates to almost 5,000 additional hospitalisations.

Diagnosis: The rates of otitis externa, middle ear and inner ear-related hospitalisations for any diagnosis were 2.1, 1.6 and 1.3 times the rate respectively, compared with using principal diagnosis only. The largest difference in rates was for hearing loss-related hospitalisations, which were 3.9 times the rate with any diagnosis compared with principal diagnosis only (1.0 and 0.2 per 1,000 population respectively).

Middle ear-related conditions remained the most common reason for ear or hearing-related hospitalisations using any diagnosis (4.9 per 1,000 population, 70% of ear or hearing-related hospitalisations).

Age: Indigenous children aged 0–14 accounted for over half (57%) the additional ear or hearing-related hospitalisations based on any diagnosis. This increased the rate of ear or hearing related hospitalisations for Indigenous children aged 0–14 from 8.1 to 13 per 1,000 population. The increase in the rate of hospitalisations was greatest among Indigenous adults aged 75 and over, increasing from 5.3 to 13 per 1,000 population when additional diagnoses were included.

5.1.2 Hospitalisations for injuries to the ear

In addition to diseases of the ear and mastoid process, people can be hospitalised for injuries to the ear. Common can include wounds and foreign bodies in the ear. Some injuries are caused by ear infections. For example, ear infections are a cause of traumatic rupture of the eardrum in children.

Overall: Between July 2018 and June 2020, 560 hospitalisations were among Indigenous Australians (0.3 per 1,000 population) with a principal diagnosis of injuries to the ear. Indigenous Australians had 2.7 times the age-standardised rate of hospitalisations for injury to the ear compared with non-Indigenous Australians (0.3 compared with 0.1 per 1,000 population).

Diagnosis: For Indigenous Australians, the most common reason for hospitalisations for injury to the ear were foreign bodies in the ear (265 hospitalisations, 0.2 per 1,000 population). The second most common reason was open wounds of the ear and auditory structures (226 hospitalisations, 0.1 per 1,000 population).

Age: The reason for hospitalisations varied by age. Indigenous children aged 0–14 had the highest rate of hospitalisations for foreign bodies in the ear (236 hospitalisations, 0.4 per 1,000 population), while Indigenous Australians aged 15 and over had higher rates of hospitalisations for open wounds of the ear (162, 0.1 per 1,000 population).

5.1.3 Hospitalisations for ear or hearing-related procedures

Different procedures can be used to treat ear disease and associated hearing loss (Box 5.2).

Box 5.2: Ear or hearing-related procedures

Common ear or hearing-related procedures include:

Myringotomy. This takes place with or without grommet insertion. The procedure involves making a small cut in the eardrum and sucking out the fluid in the middle ear. A grommet is a small ventilation tube designed to allow air to flow into the middle ear and prevent a build-up of fluid. If required, it is inserted into the eardrum once the fluid is drained.

Myringoplasty. This is to repair a hole (perforation) in the eardrum. A perforation can occur due to otitis media, other chronic infections, or a grommet. The surgeon covers the hole with a graft.

Mastoidectomy. This involves removing diseased mastoid air cells. The mastoid is part of the skull located behind the ear. Air cells are air-filled cavities made of bone located in the mastoid. Mastoid cells often become diseased as a result of an ear infection that has spread to the skull. A mastoidectomy can also be used to remove cholesteatoma, a buried pocket of skin growth in the middle ear often caused by repeated middle ear infections.

Examination with ear toileting. This involves clearing wax, discharge, debris or foreign bodies from the ear canal. Examination can be of the external or middle ear.

Other procedures. These can occur in many areas of the ear and include insertions, removals, excisions, reconstructions and repair procedures.

Overall: In 2018–20, 8,500 in-hospital ear or hearing-related procedures were for Indigenous Australian patients (5.0 per 1,000 population).

Procedures: The most common procedure was myringotomy (with and without grommets) (4,500 procedures, 2.7 per 1,000 population), followed by ear toileting and other application, insertion or removal procedures on the middle ear (excluding grommet insertion) (1,100, 0.7 per 1,000 population) and myringoplasty (800, 0.5 per 1,000 population) (Figure 5.2a).

Age: Indigenous children aged 0–14 accounted for 77% (6,500) of all ear or hearing-related hospital procedures by Indigenous Australians, at a rate of 12 per 1,000 population. More information: Section 7.4.2 Middle ear-related procedures.

The rate of ear or hearing-related procedures was lowest among Indigenous Australians aged 15–54 (1.6 per 1,000 population, 1,500 in-hospital procedures). This increased to 2.2 per 1,000 population for Indigenous Australians aged 55 and over (455 in-hospital procedures).

Sex: Indigenous males experienced slightly higher rates of ear or hearing-related hospital procedures than Indigenous females (5.6 compared with 4.5 per 1,000 population). The difference in rates for males and females was most pronounced for Indigenous children aged 0–14, where males had a procedure rate of 13 per 1,000 population and females 10 per 1,000 population (Figure 5.2b).

Remoteness area: Among Indigenous Australians, the rate of ear or hearing-related procedures were highest for Indigenous Australians usually living in *Very remote* areas (5.9 per 1,000 population) and lowest in *Outer regional* areas (4.1 per 1,000 population) (Figure 5.2c).

State/territory: The rate of ear or hearing-related hospital procedures was highest for usual residents of Western Australia (6.0 per 1,000 population) and lowest in Tasmania (3.1 per 1,000 population) (Figure 5.2d).

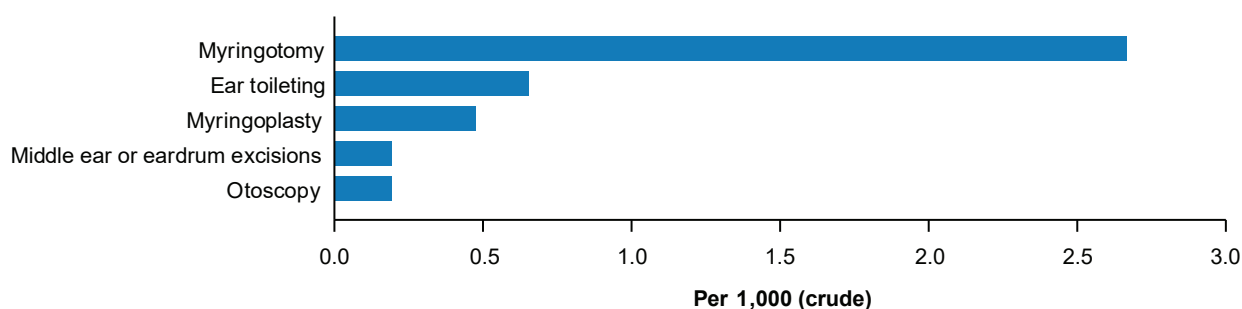
Time trend: Between 2010–11 and 2014–15, the rate of ear or hearing-related hospital procedures for Indigenous Australians was stable at around 4.0 per 1,000 population. Rates increased to 5.5 per 1,000 population in 2018–19 and decreased in 2019–20 to 4.6 per 1,000 population. Trends among Indigenous children were more pronounced.

Among Indigenous children aged 0–4, the rate of ear or hearing-related hospital procedures doubled between 2010–11 and 2018–19 (9.0 and 18 per 1,000 population respectively). It decreased to 15.3 per 1,000 population in 2019–20. Across this period, rates for Indigenous children aged 0–4 rates were lower than for non-Indigenous children aged 0–4. However, the gap between Indigenous and non-Indigenous children aged 0–4 decreased over the period (from a gap of 9.5 per 1,000 in 2010–11 to a gap of 0.7 per 1,000 in 2019–20).

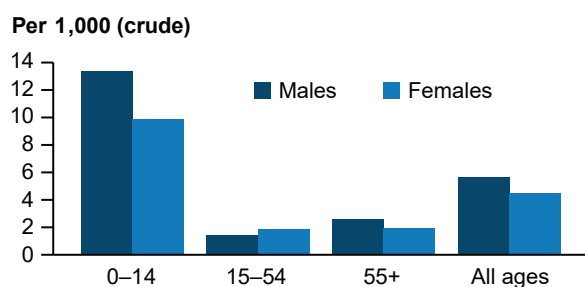
Among Indigenous children aged 5–14, the rate of ear or hearing-related hospital procedures also increased between 2010–11 and 2017–18 (7.8 and 10.9 per 1,000 population respectively). It decreased to 8.0 per 1,000 population in 2019–20. Across this period, rates for Indigenous children aged 5–14 rates were higher than for non-Indigenous children aged 5–14. The gap between Indigenous and non-Indigenous children aged 5–14 increased over the period (from a gap of 1.1 per 1,000 in 2010–11 to a gap of 3.0 per 1,000 in 2019–20) (Figure 5.2e).

Figure 5.2: Ear or hearing-related hospital procedures, by selected characteristics

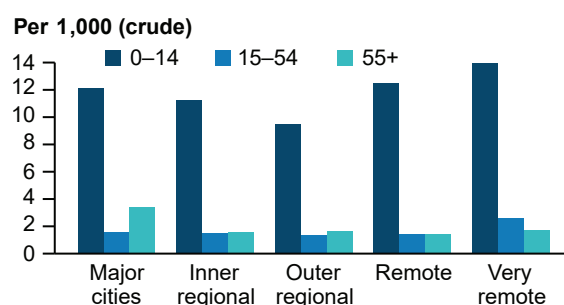
a) Indigenous, by procedure type, 2018–20



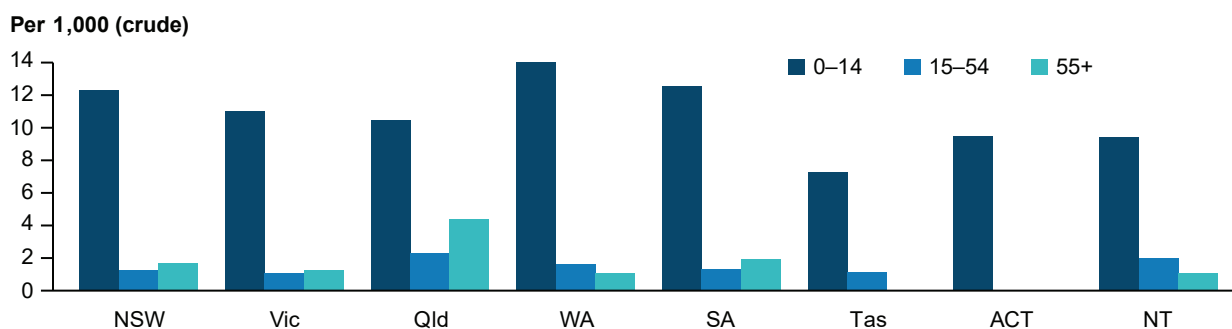
b) Indigenous, by age and sex, 2018–20



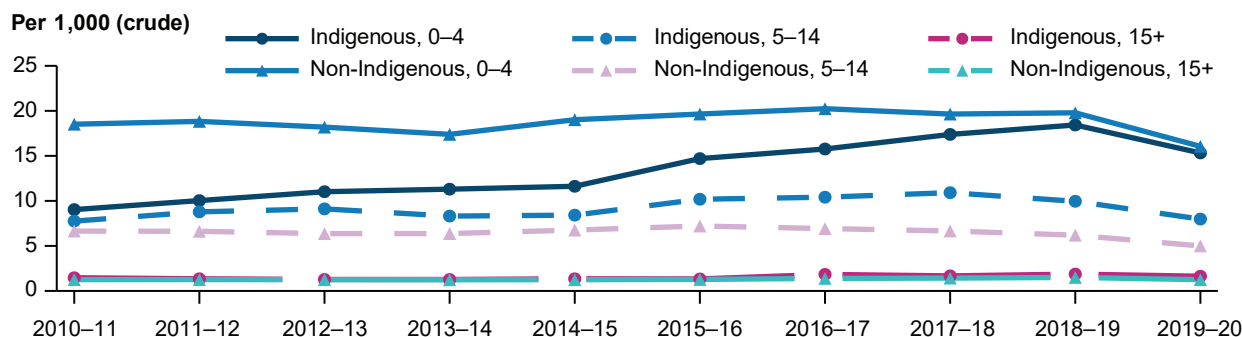
c) Indigenous, remoteness area and age, 2018–20



d) Indigenous, by state/territory and age, 2018–20



e) Time trend, by Indigenous status and age, 2010–11 to 2019–20



Notes:

1. Figure (a) shows the top 5 procedure groups for Indigenous Australians. Myringotomy includes procedures with and without the insertion of grommets, 'ear toileting' refers to ear toileting and other application, insertion or removal procedures on the middle ear.

2. Data for these figures are available in the online supplementary tables.

Source: AIHW NHMD.

5.1.4 Waiting times

Elective surgery is planned surgery that can be booked in advance as a result of a specialist clinical assessment and the patient being placed on a waiting list. Data on waiting times measure the amount of time elapsed from a person being placed on a waiting list to admission for their procedure. The length of time patients wait is a measure of the accessibility of elective surgery. However, data do not include the length of time for other steps in the clinical pathway for elective surgery to take place, including time taken to diagnose the underlying condition and refer the patient to an ENT specialist, or waiting times for appointments with an ENT.

Data on waiting times for admissions from public hospital elective surgery waiting lists is available for myringotomy and myringoplasty (Box 5.2) from the National Elective Surgery Waiting Times Data Collection.

Patients waiting for these surgeries are classified into three 'clinical urgency' categories, which determine the maximum recommended waiting time (Box 5.3).

Box 5.3 Clinical urgency of elective surgical procedures

Every patient waiting for elective surgery is assessed by their treating medical professional as Category 1, 2 or 3 per the following definitions:

- **Category 1 – Needing treatment within 30 days.** Has the potential to deteriorate quickly to the point where the patient's situation may become an emergency
- **Category 2 – Needing treatment within 90 days.** Patient's condition causes pain, dysfunction or disability. Unlikely to deteriorate quickly or become an emergency
- **Category 3 – Needing treatment at some point in the next year.** Patient's condition causes minimal or no pain, dysfunction or disability. Unlikely to deteriorate quickly and does not have the potential to become an emergency.

Waiting times for elective myringotomy surgery

Overall: In 2018–20, there were 1,600 admissions for Indigenous Australians from public hospital waiting lists for elective myringotomy surgery. Of these patients:

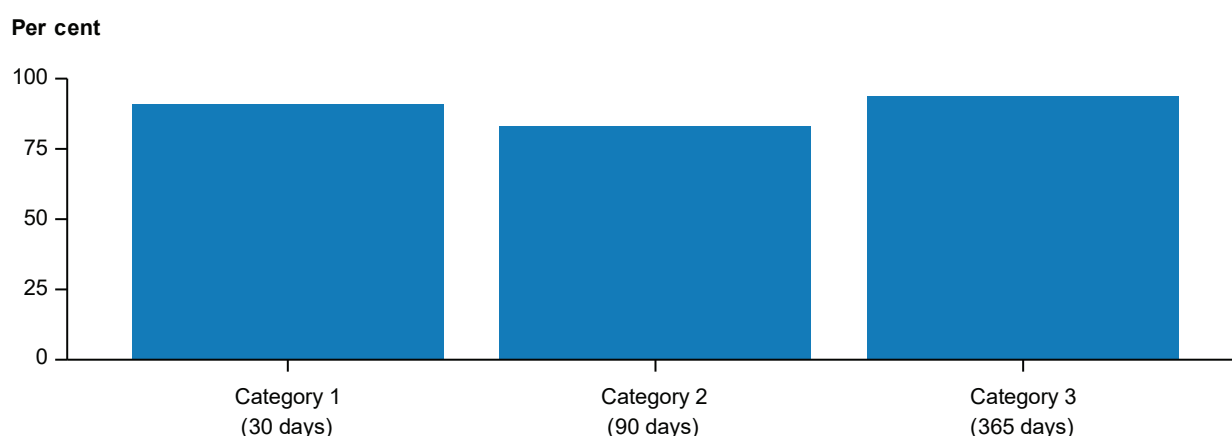
- 50% waited at least 75 days (around 2.5 months) for admission, which was longer than for non-Indigenous Australians (62 days)
- 90% were admitted within 278 days (just under 9 months).

Clinical urgency: In, 2018–20, over half (57%) of Indigenous Australians admitted for myringotomy surgery were classified as Category 2 urgency, needing treatment within 90 days (Table 5.1). Of these patients, 83% were admitted within the recommended time (Figure 5.3). For non-Indigenous patients admitted for myringotomy surgery, 64% were classified as Category 2 urgency and 84% of non-Indigenous Category 2 patients were admitted within the recommended time.

Table 5.1: Number of admissions for elective myringotomy procedures, by Indigenous status and clinical urgency, 2018–20

| Clinical urgency category | Indigenous Australians | Non-Indigenous |
|---------------------------|------------------------|---------------------|
| Category 1 (30 days) | 111 (7%) | 754 (7%) |
| Category 2 (90 days) | 910 (57%) | 6532 (64%) |
| Category 3 (365 days) | 582 (36%) | 2955 (29%) |
| Total | 1603 (100%) | 10241 (100%) |

Figure 5.3: Proportion of elective myringotomy waiting times within clinical guideline, Indigenous Australians, by clinical urgency, 2018–20



Note: Data for these figures are available in the online supplementary tables.

Source: AIHW National Elective Surgery Waiting Times Data Collection.

Age: In 2018–20, almost all (93%) admissions for Indigenous Australians from public hospital waiting lists for elective myringotomy surgery were for children aged 0–14 and half (50%) were for children aged 0–4. For non-Indigenous Australians, 81% were for children aged 0–14 and 48% for children aged 0–4.

Median waiting time increased with age, from 70 days for Indigenous children aged 0–4 to 84 days for those aged 10–14 and 15 and over (Figure 5.4a).

Remoteness area: In 2018–20, waiting times for admission for Indigenous Australians were generally shorter in more remote areas (Figure 5.4b):

- 50% of Indigenous Australian patients living in *Remote* areas were admitted within 63 days, compared with 80 days for those living in *Major cities*
- 90% of Indigenous Australian patients living in *Very remote* areas were admitted within 189 days, compared with 325 days for those living in *Major cities*.

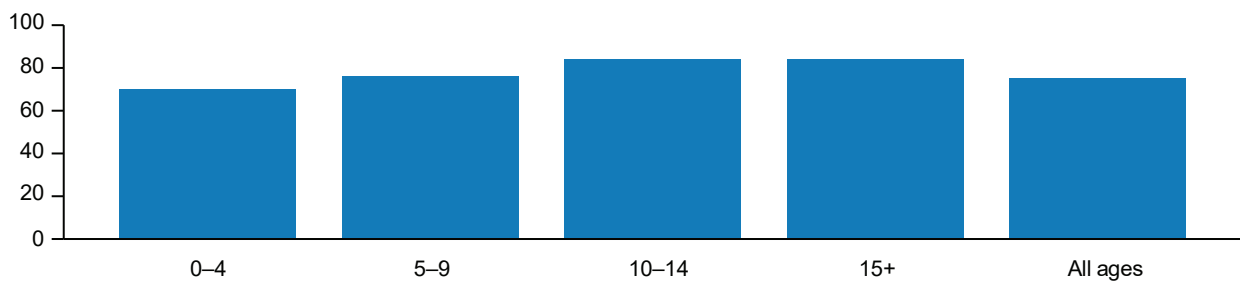
State/territory: In 2018–20, the median waiting time was shortest for Indigenous Australians who were usual residents of South Australia (40 days) (Figure 5.4c).

Time trend: Between 2012–13 and 2018–19, the median waiting time for Indigenous Australians for myringotomy increased by 23 days (from 54 to 77 days). In 2019–20 the median waiting time decreased to 71 days. Between 2012–13 and 2019–20, the waiting times for non-Indigenous Australians increased by 13 days (from 49 to 62) for myringotomy (Figure 5.4d).

Figure 5.4: Median waiting times for elective myringotomy, by selected characteristics

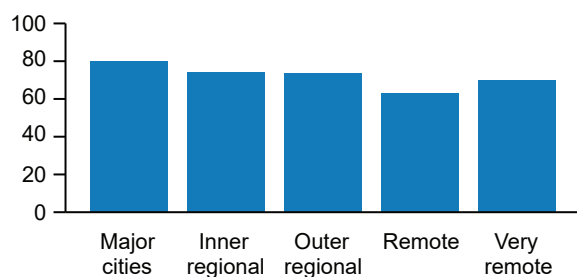
a) Indigenous, by age, 2018–20

Waiting time (days)



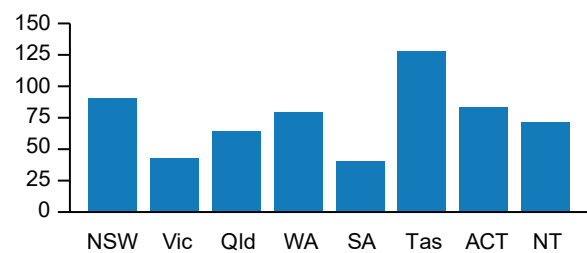
b) Indigenous, by remoteness area, 2018–20

Waiting time (days)



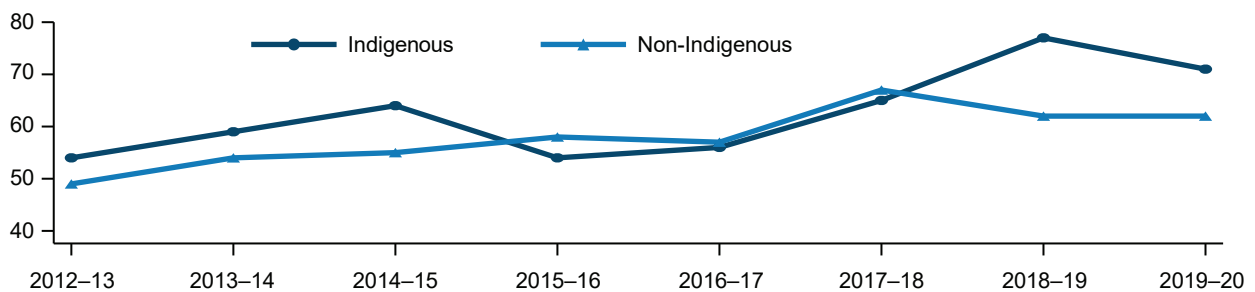
c) Indigenous, by state/territory, 2018–20

Waiting time (days)



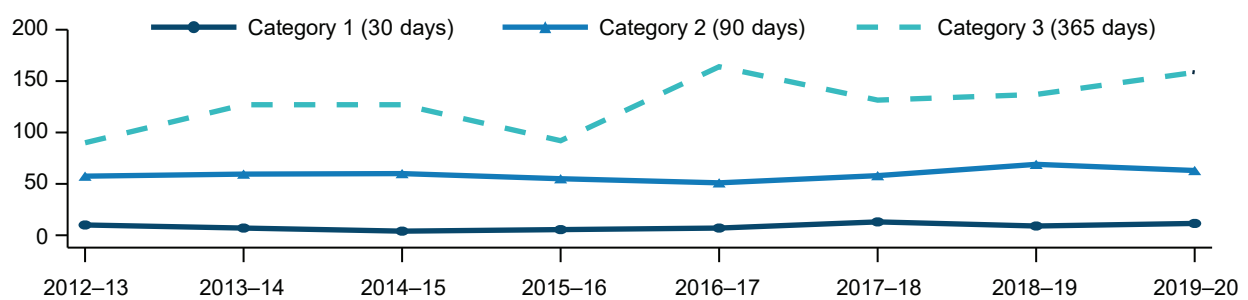
d) Indigenous status, 2012–13 to 2019–20

Waiting time (days)



e) Myringotomy procedure waiting times for Indigenous patients, by clinical urgency, 2012–13 to 2019–20

Waiting time (days)



Notes

1. Data for these figures are available in the online supplementary tables.
2. Figure (c) shows data for some states and territories which may be based on a small number of admissions and should be interpreted with caution, see online supplementary table for more details.

Source: AIHW National Elective Surgery Waiting Times Data Collection.

Waiting times for elective myringoplasty surgery

Overall: In 2018–20, there were 580 admissions for Indigenous Australians from public hospital waiting lists for elective myringoplasty surgery. Of these patients:

- 50% waited at least 129 days (just over 4 months) for admission, which was shorter than for non-Indigenous Australians at 230 days (or around 7.5 months)
- 90% were admitted within 369 days.

Clinical urgency: In 2018–20, of Indigenous Australians admitted for myringoplasty surgery:

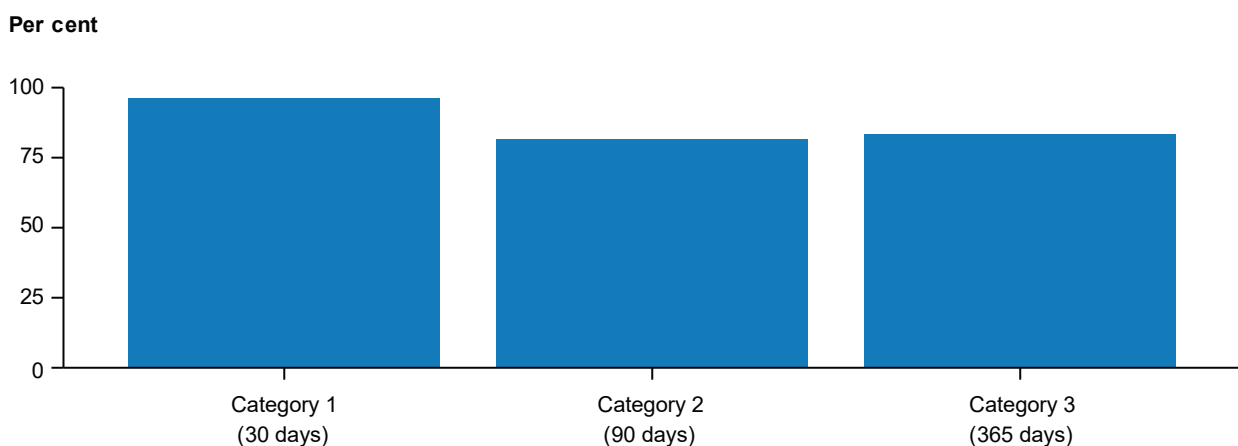
- 2 in 3 (68%) were classified as Category 3 urgency, needing treatment within 365 days (Table 5.2). Of these, 83% were admitted within the recommended time (Figure 5.5).
- 1 in 4 (27%) were classified as Category 2 urgency, needing treatment within 90 days. Of these, 82% were admitted within the recommended time.

A smaller proportion of non-Indigenous Australians admitted for myringoplasty surgery were admitted within the recommended time. Among patients classified as Category 3 and Category 2 urgency, 71% and 60% respectively were admitted within the recommended time.

Table 5.2: Number of admissions for elective myringoplasty procedures, by Indigenous status and clinical urgency, 2018–20

| Clinical urgency category | Indigenous Australians | Non-Indigenous |
|---------------------------|------------------------|---------------------|
| Category 1 (30 days) | 27 (5%) | 60 (2%) |
| Category 2 (90 days) | 158 (27%) | 835 (32%) |
| Category 3 (365 days) | 392 (68%) | 1,699 (65%) |
| Total | 577 (100%) | 2,594 (100%) |

Figure 5.5: Proportion of elective myringoplasty waiting times within clinical guideline, Indigenous Australians, by clinical urgency, 2018–20



Note: Data for these figures are available in the online supplementary tables.

Source: AIHW National Elective Surgery Waiting Times Data Collection.

Age: In 2018–20, around 3 in 5 (58%) admissions for Indigenous Australians from public hospital waiting lists for myringoplasty surgery were for children aged 0–14. Waiting times for admission tended to increase with age. The median waiting time was shorter for Indigenous Australians aged 0–9 (101 days) and 10–14 (98 days) than Indigenous Australians aged 15 and over (204 days) (Figure 5.6a).

Remoteness area: In 2018–20, waiting times for admission by Indigenous Australians were generally shorter in more remote areas, except for *Very remote* areas. For Indigenous Australian patients:

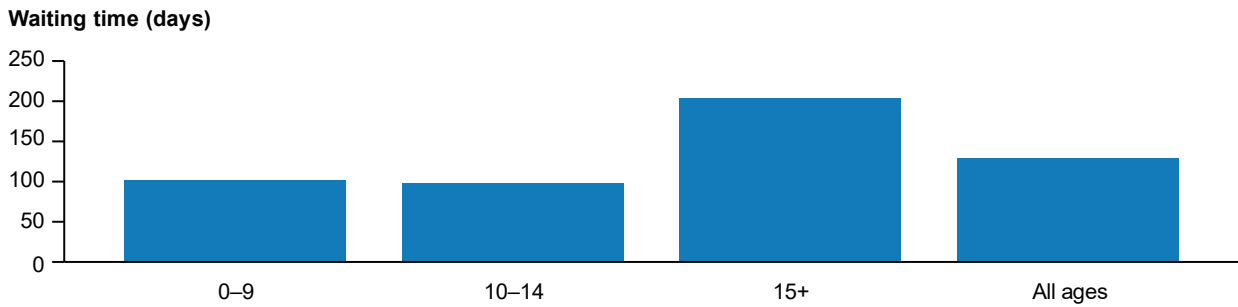
- 50% living in *Remote* areas were admitted within 65 days, compared with 192 days for those living in *Major cities*
- 90% living in *Remote* areas were admitted within 359 days, compared with 418 days for those living in *Major cities*
- living in *Very remote* areas, 50% of patients waited at least 138 days for admission and 90% were admitted within 371 days. These were the longest waiting times apart from *Major cities* (Figure 5.6b).

State/territory: For myringoplasty, the median waiting time was longest in Northern Territory (194 days) (Figure 5.6c).

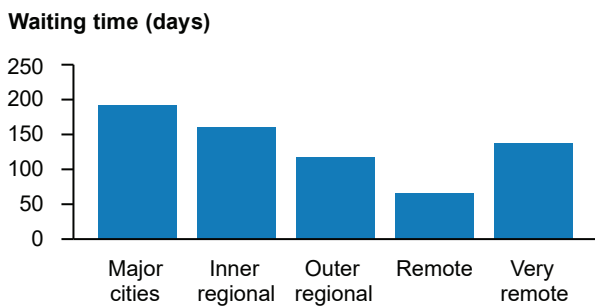
Time trend: The median waiting times for admission of Indigenous Australian patients oscillated over the period 2012–13 to 2019–20 (121 days in 2012–13 and 131 days in 2019–20). Between 2012–13 and 2019–20, the waiting times for non-Indigenous Australians increased from 123 days to 233 days (Figure 5.6d).

Figure 5.6: Median waiting times for elective myringoplasty, by selected characteristics

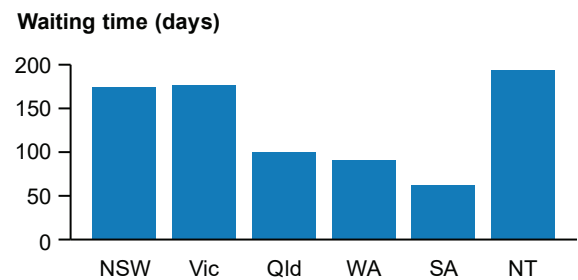
a) Indigenous, by age, 2018–20



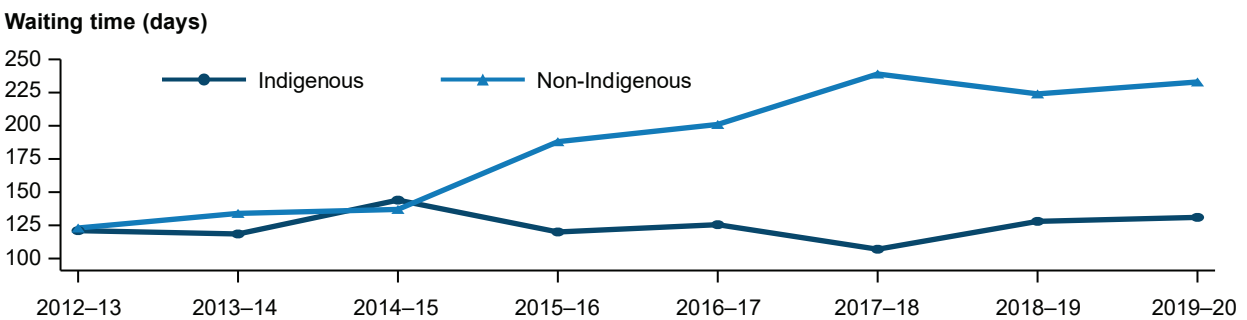
b) Indigenous, by remoteness area, 2018–20



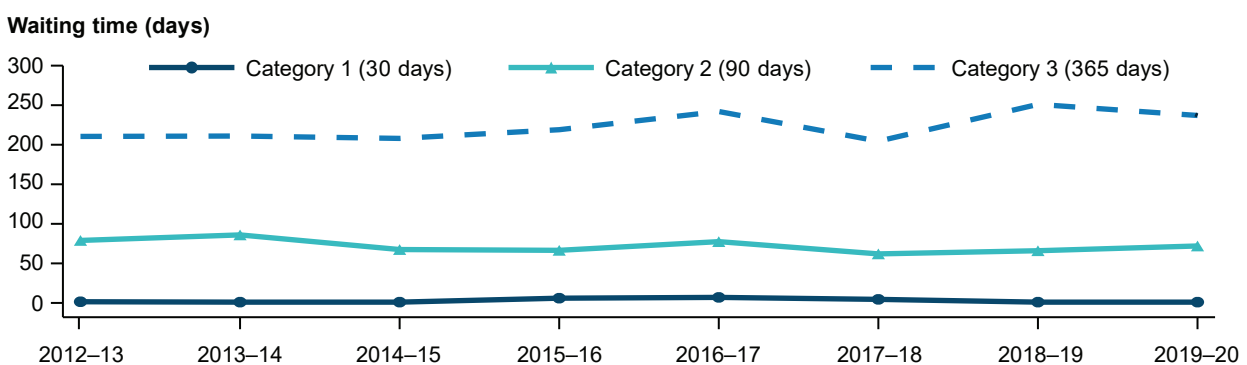
c) Indigenous, by state/territory, 2018–20



d) Indigenous status, 2012–13 to 2019–20



e) Myringoplasty procedure waiting time for Indigenous patients, by clinical urgency, 2012–13 to 2019–20



Note: Figures (b) and (c) show data for some geographies which may be based on a small number of admissions and should be interpreted with caution, see online supplementary tables for more details.

5.2 Hearing aids and cochlear implants

Hearing aids and cochlear implants (collectively called 'hearing devices') amplify sounds and can improve the user's ability to understand speech, even in noisy environments. Using a hearing device can improve mood, physical health and social activity. Early fitting of hearing devices among children with hearing loss is associated with better speech and language outcomes (Ching et al. 2018). Adults and older people who use a hearing device can reduce feelings of isolation and loneliness and reduce the risk of falls (Smith Jennifer L et al. 2005).

Hearing devices are not always necessary or appropriate for managing hearing impairment, however. They have limitations which may prevent people from choosing to use them (Burrow et al. 2009; Deafness forum of Australia 2018).

Box 5.4 Hearing aids and cochlear implants (Australian Hearing Services, 2021).

Hearing aids help people with ongoing hearing loss to make the best use of the hearing they have. They do not change a person's hearing, but they make speech louder and clearer so it is easier to hear.

Cochlear implants may suit people with severe or profound hearing loss. Rather than amplify sounds, a cochlear implant does some of the work of the inner ear and turns sounds into electrical signals, delivering them directly to the nerve endings in the ear. The aim of a cochlear implant is to allow people to hear as much speech as possible.

What is a cochlear implant?

A cochlear implant is a device that can assist people with severe or profound sensorineural hearing loss for whom hearing aids have only limited benefits. It works in a different way to hearing aids, which usually can only amplify sounds. Instead, the cochlear implant is connected directly to auditory nerve fibres in the cochlea to bypass impaired sections of the inner ear. While a cochlear implant does not restore normal hearing, it instead provides a representation of sounds which can be used to understand speech and enjoy music (Cochlear Australia n.d.).

This section presents data from Hearing Australia on the characteristics of Indigenous Australians with hearing loss who have been fitted with a hearing device and provided with services by Hearing Australia through the Hearing Services Program (HSP) (Box 5.5). The data presents a 'snapshot' of Hearing Australia clients on 31 December 2019, including:

- demographic and hearing loss characteristics of Hearing Australia clients fitted with a hearing device as at 31 December 2019
- the age at first fitting of hearing devices, by calendar year, for Hearing Australia clients aged under 26 at time of first fitting
- device usage for Hearing Australia clients aged under 26 as at 31 December 2019 provided with services through the outreach program.

Box 5.5: Hearing Services Program

The Hearing Services Program (HSP) was established in 1997 to provide access to high-quality hearing services and devices.

HSP services are delivered through 2 streams, the Voucher program and the Community Services Obligation (CSO).

The CSO stream delivers subsidised hearing services to:

- people aged 26 years
- Indigenous Australians aged 50 or over, or participants in the Community Development program
- people eligible for the Voucher stream with complex hearing or communication needs, or who live in a remote area.

CSO stream services are delivered solely by Hearing Australia. The main pathways to accessing these services are:

- newborns referred following diagnosis of hearing loss through the universal newborn hearing screening or other neonatal services
- children referred by medical, early intervention or education services
- Indigenous Australians referred by their health-care provider, or referral from the Voucher program.

Accessing the CSO stream requires participants to have received a diagnosis of permanent or persistent hearing loss before being eligible for the program.

Voucher stream services are delivered by approximately 300 approved providers as well as Hearing Australia. It delivers subsidised hearing services to people aged 21 and over who are:

- Pensioner Concession Card holders
- Defence Veterans Association Gold Care holders or White Card holders (where the card is issued for hearing loss)
- referred by the Disability Employment Services Program
- members of the Australian Defence Force.

The main avenue for accessing the Voucher stream is visiting a hearing health clinician who is an approved provider. The clinician then checks the client's eligibility and lodges an application for a voucher on the client's behalf. People can also lodge an application for a Voucher online or be referred by other services, such as the NDIS. Individuals are not required to have identified hearing issues to obtain a voucher.

Both streams provide access to subsidised hearing services, including a hearing assessment, hearing aid devices, annual hearing check-ups and advice on hearing loss prevention.

In 2019–20, 95% of Indigenous Australian HSP clients were provided services by Hearing Australia through the CSO stream, including almost 100% of Indigenous Australian HSP clients aged 0–25 and 92% aged 26 and over (Hearing Services Program Expert Review Panel 2021).

More information on HSP: Appendix C.

5.2.1 Hearing Australia clients fitted with hearing devices

Overall: As at 31 December 2019, there were 197,206 Hearing Australia clients with a hearing device fitted. Among these Hearing Australia clients, 6,949 (3.5%) identified as Indigenous Australians. The rate of Indigenous clients was 8.1 per 1,000 population.

Age: Of the 6,949 Indigenous clients, 1,247 (18%) were aged 0–14, 424 (6.1%) aged 15–25, 618 (8.9%) aged 26–49 and 4,659 (67%) aged 50 and over. The rate of Indigenous clients was highest among Indigenous Australians aged 50 and over (32 per 1,000 population), followed by Indigenous children aged 0–14 (4.4 per 1,000 population). For all age groups, a greater proportion of Indigenous Australians were clients of Hearing Australia and fitted with a hearing device than for non-Indigenous Australians (Figure 5.7a). Some difference in rates of Indigenous and non-Indigenous clients, particularly in those aged 26 and over, may be due to different HSP eligibility criteria for both groups.

Sex: There were 3,304 (7.7 per 1,000 population) Indigenous male and 3,641 Indigenous female clients (8.5 per 1,000 population).

Remoteness area: The rate of Indigenous clients increased with remoteness; from 5.6 per 1,000 population in *Major cities*, 7.6 per 1,000 population in *Inner and outer regional areas*, and 15 per 1,000 population in *Remote and very remote areas*. The increase was greatest among Indigenous clients aged 0–14, with a rate of 2.5 per 1,000 population in *Major cities* and 14 per 1,000 population in *Remote and very remote areas* (Figure 5.7c).

State/territory: The rate of Indigenous clients was highest in the Northern Territory (16 per 1,000 population), followed by Tasmania (8.6 per 1,000 population). The rate was lowest in the Australian Capital Territory (3.9 per 1,000 population) (Figure 5.7d).

Type of device: As at 31 December 2019, 6,892 Indigenous clients (99%) had a hearing aid and 115 (1.7%) with a cochlear implant. Bimodal hearing with both a cochlear implant and a hearing aid was used by 58 Indigenous clients.

Almost 2 in 3 (64%) Indigenous clients with a cochlear implant were aged under 25 (46% aged 0–14 and 18% aged 15–24). In contrast, 2 in 3 (68%) Indigenous clients with a hearing aid were aged 50 and over.

Box 5.6 Bimodal hearing – a cochlear implant and a hearing aid

Some children hear best with a cochlear implant on one ear and a hearing aid on the other. This is called 'bimodal hearing'. Bimodal hearing can make the best of:

- hearing in the ear without the cochlear implant
- hearing technology for situations with background noise.

Source: Hearing Australia, Choices, p. 21.

Level of hearing impairment: Assessment of hearing impairment is made by the level of hearing loss in the better ear based on the classifications of severity of hearing loss for children (Box 5.7). At their latest assessment, as at 31 December 2019, the majority of Indigenous clients (3,935, 57%) had normal to mild hearing impairment; 1,905 (27%) had moderate hearing impairment and 1,096 (16%) had severe or profound hearing impairment. The proportion with moderate or greater hearing impairment was greatest among Indigenous clients aged 26–49 (57%). Among Indigenous clients aged 0–14, 80% had no or mild hearing impairment in the better ear (Figure 5.7e).

It should be noted that this section presents data on hearing impairment (the ear with better hearing) among Hearing Australia clients fitted with a hearing device. This data cannot be directly compared with data present in Section 2.2. Section 2.2 presented data on severity of hearing loss (any hearing loss) among all Indigenous Australians (excluding those with a cochlear implant).

Box 5.7 Severity of hearing loss for children

Data on hearing impairment level is an average of hearing impairment at different frequencies in the better ear.

Hearing loss may affect one ear (unilateral) or both ears (bilateral).

Hearing impairment is based on the ear with better hearing, meaning that people with unilateral hearing loss are not defined as having a hearing impairment. The severity of hearing impairment is classified based on the lowest volume of sound a person can hear.

The 'no/none or mild' hearing impairment category includes people with unilateral hearing loss and people with hearing outside normal limits for some, but not all, frequencies. Children with unilateral hearing loss or mild hearing impairment are often fitted with hearing devices to help with the development of speech and with hearing during school (Hearing Australia 2020).

The classification for severity of hearing impairment for clients of Hearing Australia differs slightly from Box 2.2 (Hearing Australia 2021). The classifications of severity of hearing loss for clients of Hearing Australia are:

Normal/mild (0–40dB): May have trouble hearing and understanding soft speech, speech from a distance or speech against a background of noise.

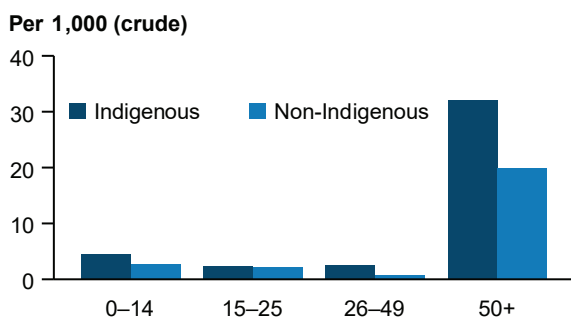
Moderate (41–60dB): May have difficulty hearing speech at a normal level even at close distances.

Severe (61–90dB): May hear little to no speech of a person talking at a normal level and only some loud sounds. Most conversational speech is not heard. Loud sounds, such as a car horn, are not as startling as they would be to a person with normal hearing.

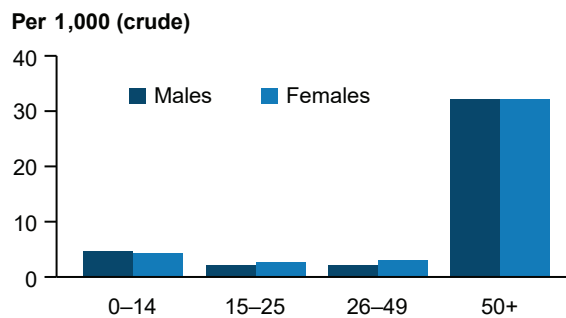
Profound (91dB+): May feel the vibrations of very loud sounds and cannot hear any speech (AIHW 2020b; Cochlear Australia n.d.; WHO 2016).

Figure 5.7: Hearing Australia clients with a hearing aid or cochlear implant, by selected characteristics, as at 31 December 2019

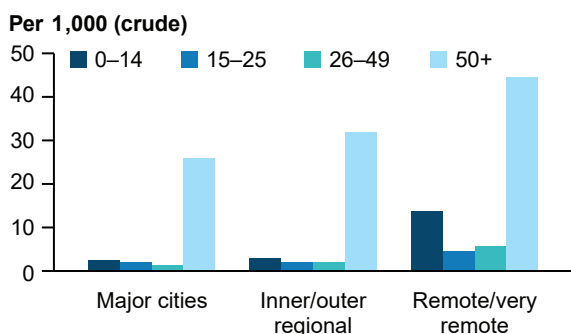
a) By age and Indigenous status*



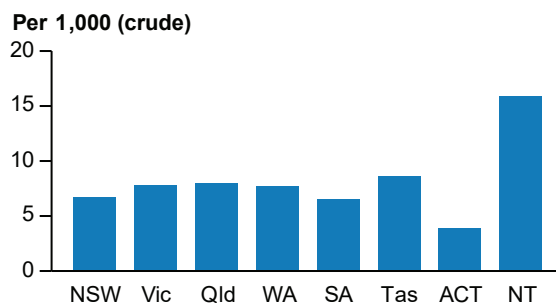
b) Indigenous, by age and sex



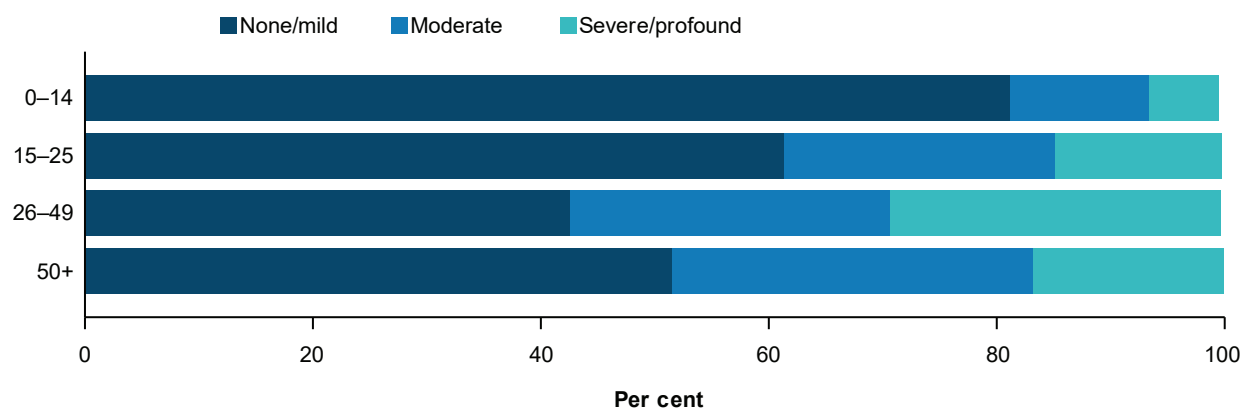
c) Indigenous, by remoteness area and age



d) Indigenous, by state/territory



e) Level of hearing impairment among Indigenous Hearing Australia clients, by age



* Eligibility criteria differ for Indigenous and non-Indigenous Hearing Australia clients aged 26 and over, affecting Indigenous-status comparisons

Notes

- Hearing impairment level is at most recent assessment.
- Figure (e) presents the proportion of Hearing Australia clients. All other figures present rate per 1,000 population. Hearing impairment is based on the ear with better hearing. Non/mild includes clients with unilateral hearing loss (one ear affected).
- Data for these figures are available in the supplementary tables.
- Data does not include the HAPEE program.

Source: AIHW analysis of Hearing Australia (2020) data.

5.2.2 Age of first fitting

For Hearing Australia clients aged 0–25 with a hearing aid or a cochlear implant (referred to in this section as ‘aided children and young adults’), data on age at first fitting are available from 2008 to 2019. Clients were provided with audiological and hearing aid or cochlear implant speech implant support services through Hearing Australia (Hearing Australia 2021). More information on Hearing Australia clients aged 0–14: Section 7.5.

Overall: Between 2008 and 2019, 4,001 Hearing Australia clients were Indigenous children and young adults aged 0–25 who had been fitted with a hearing aid or cochlear implant. In 2019, 416 aided Indigenous children and young adults aged 0–25 were newly fitted.

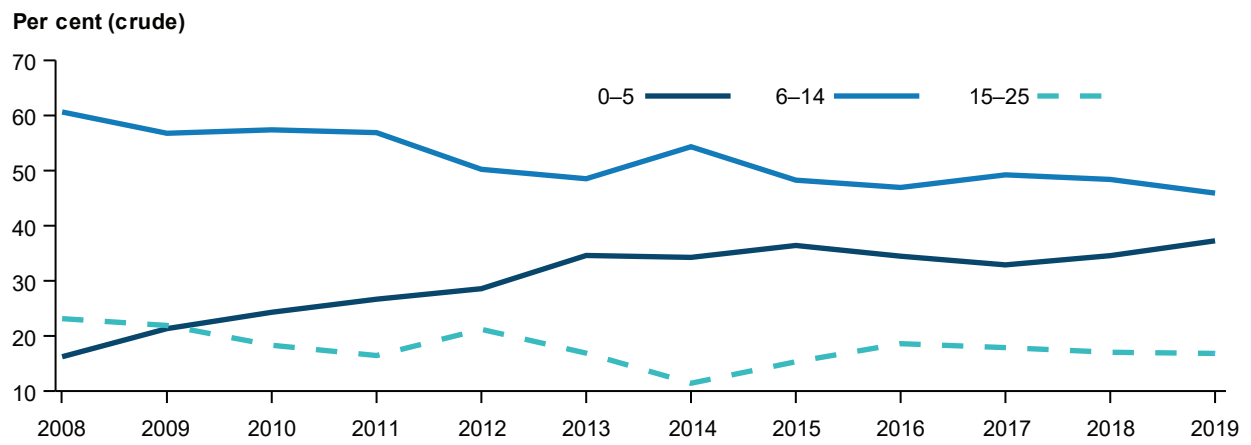
Age: In 2019, 155 (37%) of aided Indigenous children and young adults aged 0–25 were first fitted when aged 0–5, 191 (46%) were aged 6–14 and 70 (17%) were aged 15–25. The peak age of first fitting for Indigenous clients aged 0–25 was between ages 4 to 6. A total of 28% of aided Indigenous children and young adults aged 0–25 were fitted with their first hearing device between the age of 4 and 6 (Figure 5.8c).

Time trend: Between 2008 and 2019, there was a trend toward earlier ages of first fitting. Among aided Indigenous children and young adults, the proportion first fitted in the 0–5 age group increased by 21 percentage points from 16% in 2008 to 37% in 2019 (Figure 5.8a). The peak ages of first fitting decreased from 8–9 years to 4–6 years of age (Figure 5.8b).

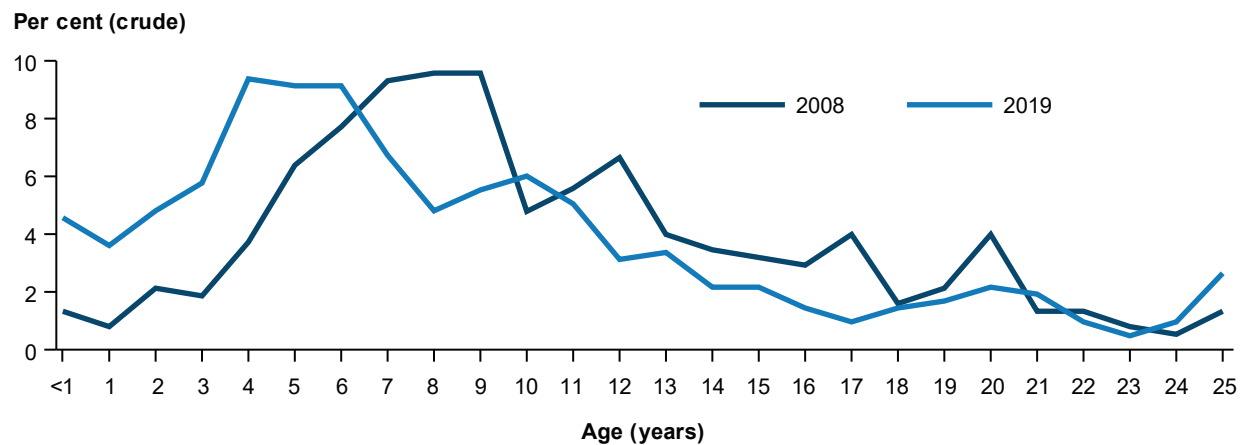
Indigenous status: In 2019, 5% of aided Indigenous children and young adults were fitted with their first hearing device before the age of one. In comparison, 18% of aided non-Indigenous children and young adults were fitted before the age of one.

Figure 5.8: Age of first hearing aid or cochlear implant fitting of aided Hearing Australia clients aged 0–25, by selected characteristics

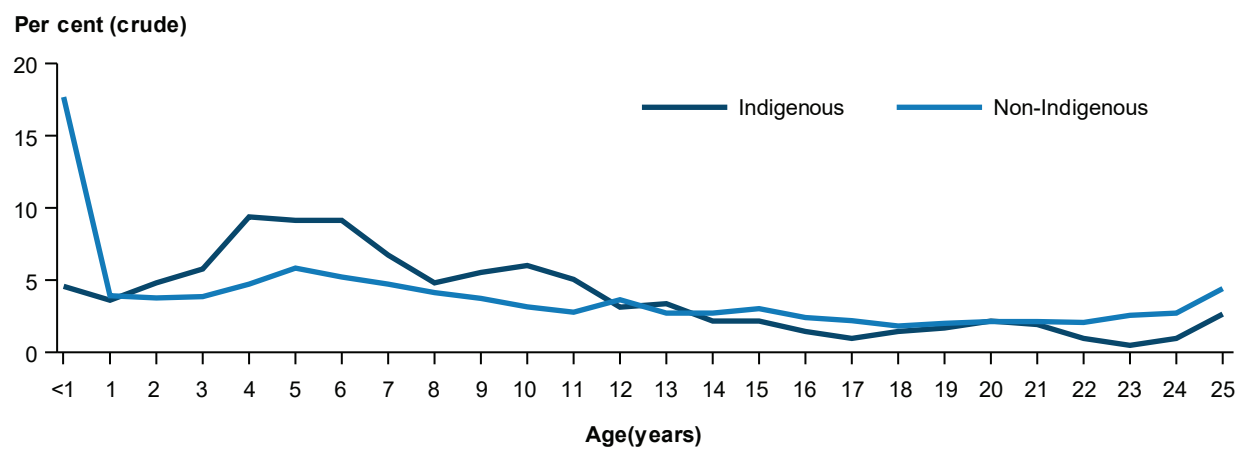
a) Indigenous, by age, 2008 to 2019



b) Indigenous, age distribution, 2008 and 2019



c) Age distribution, by Indigenous status, 2019



Note: Percentages are the proportion of Hearing Australia clients who were first fitted with a hearing device before the age of 26 in a given year.

Source: AIHW analysis of Hearing Australia (2020) data.

5.3 National Disability Insurance Scheme

The NDIS provides supports to eligible Australians with permanent disability which substantially impacts their ability to complete everyday activities (National Disability Insurance Agency 2021d). Scheme participants choose and pay for their supports and services out of an individually allocated budget based on their goals. (National Disability Insurance Agency 2021c).

The NDIS funds public hearing services for participants with confirmed hearing loss who are not eligible for the Hearing Services Program (HSP), including hearing aids (National Disability Insurance Agency 2021b). People eligible for HSP and NDIS can use NDIS to fund additional services and supports not available through the HSP. This may include funding towards maintenance and replacement of hearing aids, additional assistive listening devices, and interpreting services. Early intervention supports are also provided under the NDIS to eligible children aged under 7. More information: <https://www.ndis.gov.au/understanding/ndis-and-other-government-services/hearing-supports>

This section presents summary information on Indigenous participants in the NDIS with a reported hearing impairment.

Box 5.8 NDIS eligibility for hearing impairment

To be eligible for the NDIS, the impairment must be, or be likely to be, permanent; substantially reduce functional capacity, affect the participant's capacity for social or economic participation; and require lifetime support. A person must be aged under 65 to access the NDIS.

For hearing impairment, a hearing impairment of 65 decibels or greater in the better ear is generally considered the lower limit of what is likely to constitute a substantially reduced functional capacity. Hearing impairments of less than 65 decibels in conjunction with other permanent impairments, or where there is evidence of poorer than expected speech detection and discrimination outcomes, may also be eligible (National Disability Insurance Agency 2019).

There are several ways that ACCHS may be able to assist eligible participants in their communities with navigating pathways to the NDIS and help participants to access culturally appropriate NDIS services (Box 5.9).

Box 5.9 Support to access NDIS supports

Navigating access to NDIS supports can be complex. Feedback from the ACCHO sector described a range of ways they help their communities access culturally appropriate NDIS supports for eligible participants, including:

- referral to service providers for support with accessing NDIS, including the NDIS's National Community Connector Program. This service was created to support Indigenous Australians and other selected communities in accessing the NDIS, with support through the planning process and connecting participants with culturally appropriate services.
- ACCHS may become registered NDIS service providers
- other NDIS service providers may provide services at the ACCHSs site

In addition, the National Disability Insurance Agency is currently refreshing their Aboriginal and Torres Strait Islander Engagement Strategy, planned for release in 2022 (National Disability Insurance Agency 2021a).

Overall: As of 30 June 2020, 1,700 Indigenous Australians were active participants in the NDIS and reported hearing impairment as a disability (5.3% of the 32,400 Indigenous Australian NDIS participants). Of these participants, 1,000 Indigenous Australian participants reported hearing impairment as their primary disability (3.1% of all Indigenous participants, Box 5.10).

Box 5.10 Primary disability and level of function

NDIS participants may have more than one disability. Participants have one primary disability and may have multiple additional disabilities recorded.

Primary disability is the impairment that impacts most on daily functioning.

Reported disability includes the primary disability and all other disabilities reported by the participant.

Disability groups are a broad categorisation of disabilities considering factors such as underlying health condition, type of impairment, activity limitations and participation restrictions. The disability groups are reported as hearing impairment, acquired brain injury (ABI), autism, cerebral palsy, intellectual disability, developmental delay, global developmental delay, Down syndrome, multiple sclerosis, psychosocial disability, spinal cord injury, stroke, vision impairment, other.

Level of function. To access the NDIS, a person's disability must substantially reduce their functional capacity to undertake one or more of the following activities: moving around, communicating, socialising, learning, or undertaking self-care or self-management tasks. Functional capacity may affect participation at home, at school, at work, or in social situations.

Primary disability group: Of the 1,700 Indigenous Australian participants with hearing impairment the top 3 primary disability groups were hearing impairment (59%), intellectual disability (17%) and autism spectrum disorder (6%) (Figure 5.9a).

Age: Indigenous Australian participants with hearing impairment were more likely to be aged 15 and over than all Indigenous Australian participants (59% compared with 52% respectively) (Figure 5.9b).

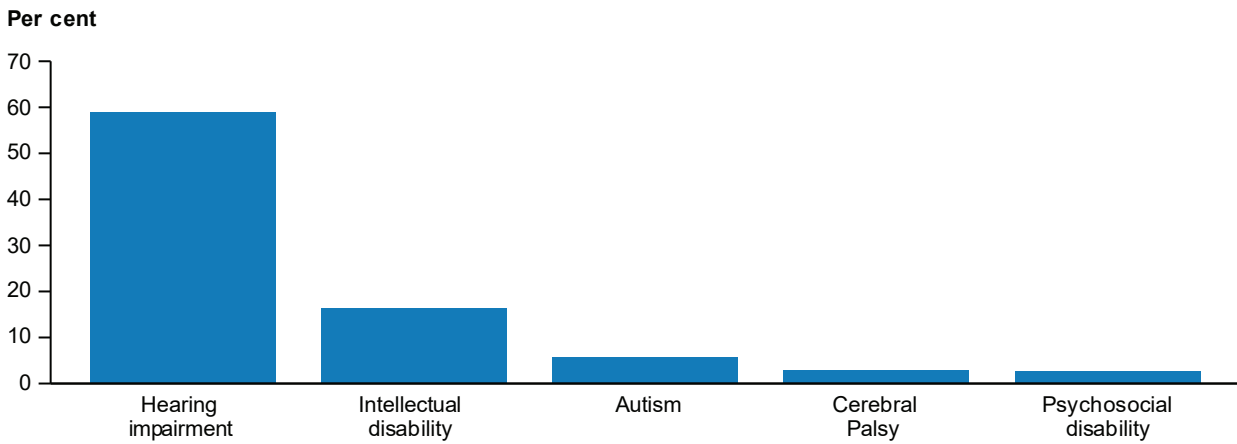
Remoteness: Indigenous Australian participants with hearing impairment were more likely to live in *Remote or very remote* communities (19%) than all Indigenous Australian participants (11%) (Figure 5.9c).

State/Territory: Almost 2 in 3 Indigenous Australian participants with hearing impairment lived in Victoria (32%) or New South Wales (31%) (Figure 5.9d). Less than 1% lived in Northern Territory.

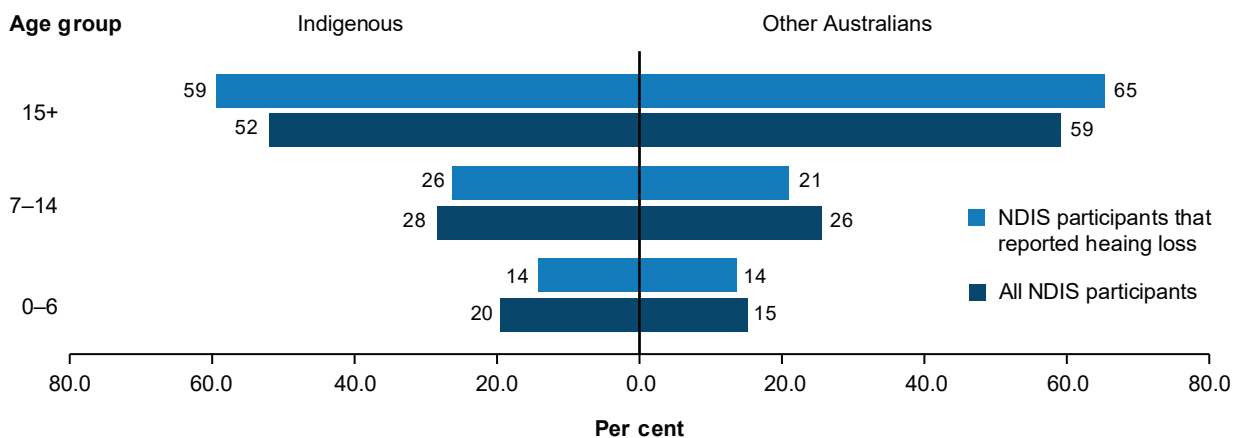
Level of function: Indigenous participants with hearing impairment were more likely to have a high level of function than all Indigenous Australian participants (49% compared with 32% respectively) (Figure 5.9e). A high level of function was more likely if hearing impairment was the primary disability (68%).

Figure 5.9: Indigenous Australian NDIS participants with hearing impairment, by selected characteristics, 30 June 2020

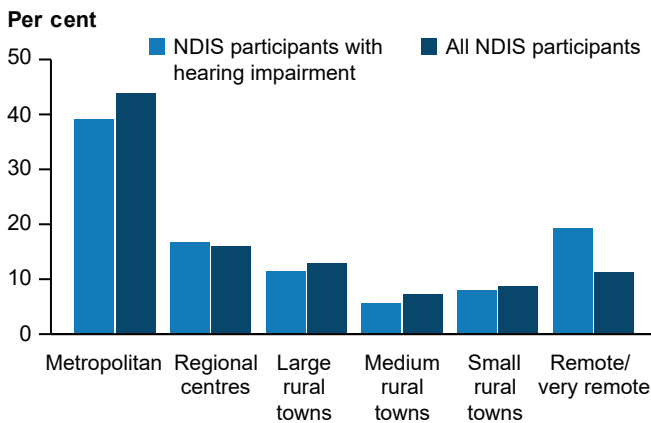
a) Indigenous participants by Primary disability group



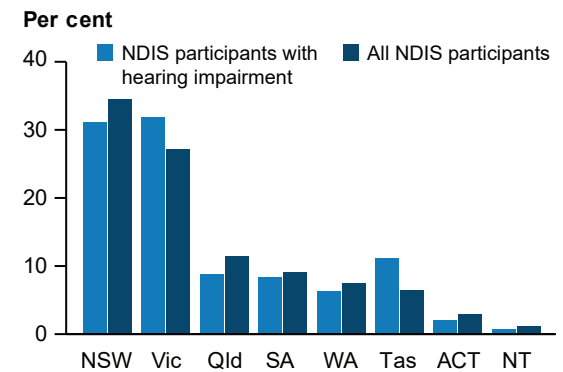
b) By age, Indigenous status and disability group



c) Indigenous participants by remoteness (MMM) and disability group



d) Indigenous participants by state and territory and disability group

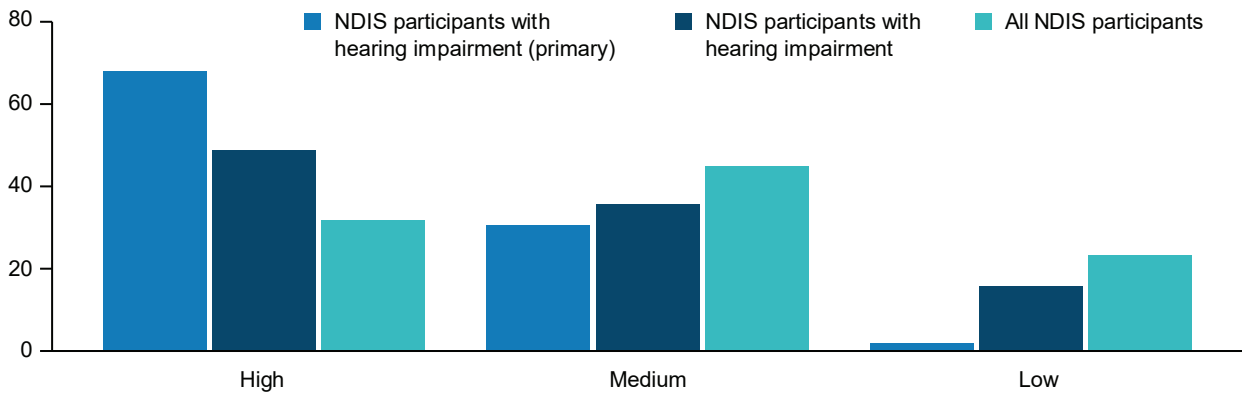


(continued)

Figure 5.9 (continued): Indigenous Australian NDIS participants with hearing impairment, by selected characteristics, 30 June 2020

e) Indigenous participants by level of function and disability group

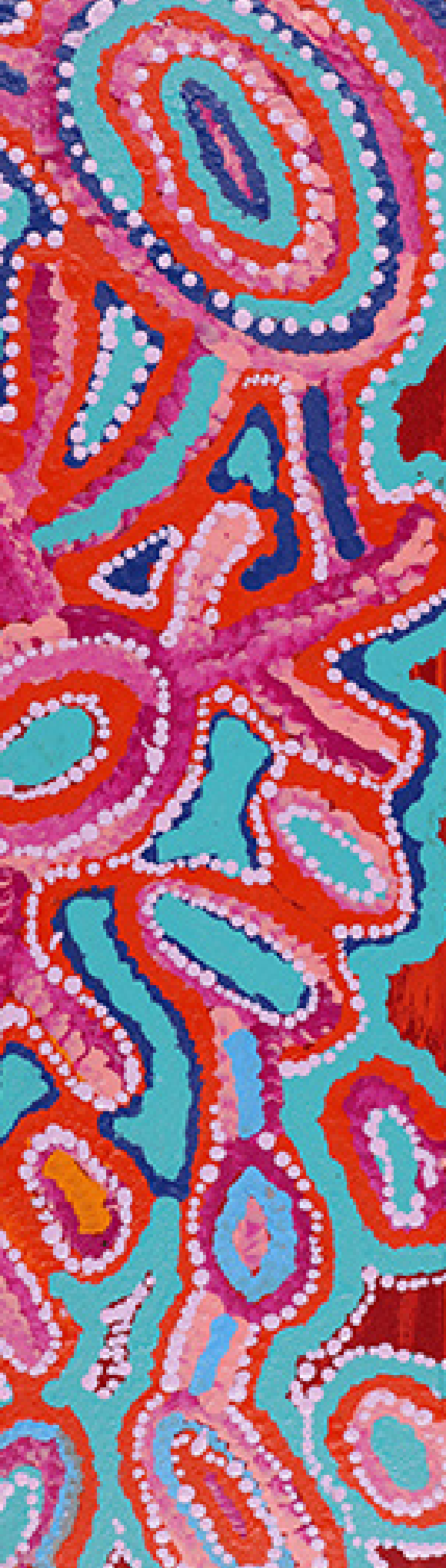
Per cent



Notes

1. Disability groups: ABI, Autism, Cerebral Palsy, Developmental delay, Down syndrome, global developmental delay, intellectual disability, multiple sclerosis, other, other neurological, other physical, other sensory/speech, psychosocial disability, spinal cord injury, stroke, visual impairment.
2. Figure e uses the Modified Monash Model (MMM). MMM is a geographical classification that categorises different areas in Australia into seven remoteness categories: MM1=Metropolitan, MM2=Regional centres, MM3=Large rural towns, MM4=Medium rural towns, MM5=Small rural towns, MM6=Remote communities, MM7=Very remote communities.
3. Data that are categorised according to disability group may sum to more than the total NDIS participants, as they can be recorded.

Source: AIHW analysis of NDIA data (unpublished).



6



Workforce

6 Workforce



What do we know?

Accessibility and availability of culturally safe ear and hearing health specialist services is key to seeking timely diagnosis and treatment.

The availability of ear and hearing health specialist services

- In 2016, 1,885 people reported their occupation as an audiologist, a rate of 7.8 per 100,000 population. Almost 4 in 5 (78%) audiologists lived in *Major cities*.
- In 2019, 475 ENT specialists were employed in Australia (2.1 full time equivalent per 100,000 population). Over 4 in 5 ENT specialists' principal place of practice was *Major cities*.

The ear and hearing health workforce is critical to delivering ear and hearing health services, for Indigenous Australians. Programs are provided by health-care providers including Aboriginal Health Workers, GPs and nurses, including audiometry nurses and Maternal and Child Health nurses. They are also provided by community hearing health workers, Ear Health Coordinators, audiologists, audiometrists, clinical nurse specialists, ENT specialists, child ear and hearing health coordinators, occupational therapists and speech pathologists.

Other professionals, including support workers, interpreters and teachers, provide vital diagnosis, treatment and rehabilitation support for people with an ear disease or hearing loss.

Data on the ear and hearing health workforce can give an indication of the availability of specialised ear health services. This chapter describes:

- occupations providing ear and hearing health services
- number and demographics of audiologists and ENT specialists
- ear and hearing health specialists in Indigenous-specific primary health-care organisations.

It uses data from the 2016 Census of Population and Housing (the Census), the 2019 National Health Workforce Dataset and the Online Services Report (OSR).

Box 6.1 The ear and hearing health workforce

Aboriginal Health Workers provide health awareness, clinical, rehabilitation and training services, including ear and hearing screening.

Audiologists provide hearing diagnostic assessments and rehabilitative services, including counselling, speech reading and hearing aid fitting. They also assess and support other ear related conditions, such as balance problems. Audiologists have a masters degree in audiology.

Audiometrists are medical technicians who provide hearing diagnostic services and hearing aid fitting. Audiometrists must complete a 2-year diploma. They have a narrower scope of practice than audiologists.

Ear Health Coordinators support Aboriginal Medical Services to focus on ear health issues, supporting training, skill development and health awareness approaches in primary health care and improving integration between primary health care and specialist ear health services.

Community hearing health workers provide health awareness, clinical, rehabilitation and training services, including conducting ear and hearing screening.

ENT specialists or otolaryngologists are medical doctors specialising in diagnostic, preventive and surgical treatment for diseases of the ear, nose and throat.

GPs conduct ear checks, manage the treatment of many ear conditions, and provide referrals to specialist services.

Nurses provide health awareness, clinical, rehabilitation and training services, including conducting ear and hearing screening and coordinating care.

Speech pathologists diagnose and treat communication disorders, including difficulties with speech, language, fluency and voice.

Occupational therapists provide therapy so people can participate in everyday activities and occupations.

Workforce data. The Australian Health Practitioner Regulation Agency is responsible for the national registration process for 15 health professions including Aboriginal and Torres Strait Islander Health Practice, medical practice (doctors), nursing and occupational therapy. Data from the registration process forms the National Health Workforce Dataset (NHWD). Audiology is not part of the register of practitioners or the NHWD (Australian Health Practitioner Regulation Agency 2021).

Box 6.2: Workforce challenges and encouragement

Workplace challenges

The challenges faced by the ear and hearing health workforce include high staff turnover, competing demands from multiple programs and lack of staff training. These challenges reduce the capacity of the ear and hearing health workforce, particularly in rural and remote communities (Siggins Miller 2018). Feedback from the ACCHO sector noted that the quality of ear and hearing health care available is impacted by issues such as understaffing, difficulties in obtaining appropriate staff training, and lack of specialists providing outreach work:

‘Not enough specialists and audiologists providing outreach work to the more remote communities.’

‘The challenges of remote area living, as well as the demands on a fly-in-fly-out workforce, mean that despite...best efforts to retain staff, staff turnover remains reasonably high’.

‘Access to staff training is challenging...and complicated by remoteness...community based remote staff frequently miss out on training due to the burden of covering these [transport and accommodation] additional costs’.

‘The Audiologist and Audiometrist are constantly attempting to provide ear health training and mentoring to staff during community visits. However, when in community, training is constantly interrupted as local staff attempt to manage all the demands on their time and attention.’

Promoting a culturally appropriate workforce

A wide range of ongoing initiatives are encouraging health professionals to improve provision of culturally appropriate ear and hearing health services in Indigenous communities. These aim to raise awareness, support recruitment and retention of health professionals, increase outreach services, and increase representation of Indigenous Australians in the ear and hearing health workforce. Examples of initiatives:

- awareness-raising activities among health professionals, including keynote speakers and publications
- annual Indigenous Health Workshop for health professionals run by the Australian Society of Otolaryngology Head & Neck Surgery alongside its annual scientific meeting
- cultural safety learning programs for health professionals and trainees
- outreach modules required as part of training for ENT trainees
- programs, scholarships, awards, mentoring and internships supporting training pathways for Indigenous Australians entering the health workforce, including the Australian – Indigenous Surgical Pathway Program <https://www.surgeons.org/about-racs/indigenous-health/aboriginal-and-torres-strait-islander-health/scholarships-and-awards>
- services and support to improve the recruitment and retention of health professionals to provide services for Aboriginal communities through organisations such as the Rural Workforce Agency Victoria and through partnerships with ACCHOs. <https://www.rwav.com.au/>

6.1 Audiologists

Audiologists provide hearing diagnostic assessments and rehabilitative services, including counselling, communication strategies and hearing aid fitting. They also assess and support other ear related conditions, such as balance problems. The data in this section are from the 2016 Census.

Overall: In 2016, 1,885 reported their occupation as an audiologist, a rate of 7.8 per 100,000 population. Fewer than 5 audiologists identified as Indigenous Australian.

Employment characteristics: Approximately 1,140 (60%) audiologists reported working full-time (35 hours or more per week), while 717 (38%) reported working part-time (less than 35 hours per week). Most audiologists worked in the private sector (1253, 66%). The rest audiologists worked for the Australian Government (461, 24%) or a state or territory government (164, 8.7%).

Age: The median age of audiologists was 37, and 50% of audiologists were aged 30–46. Only 46 (2%) audiologists were aged 65 and over.

Sex: Approximately 3 in 4 audiologists were female (1440, 76%) and one in 4 male (443, 24%).

State/territory: The greatest proportion of audiologists lived in Victoria (552, 29%) and New South Wales (524, 28%). However, the rate of audiologists per 100,000 population was highest in Victoria (8.9 per 100,000), followed by Tasmania (8.9 per 100,000), and Queensland (8.2 per 100,000). The rate was lowest in New South Wales (6.8 per 100,000) (Figure 6.1a).

Remoteness area: Most (1471, 78%) audiologists lived in *Major cities*. The rate was highest in *Major cities* (8.5 per 100,000) and decreased with remoteness in *Inner regional* areas (7.2 per 100,000), *Outer regional* areas (4.9 per 100,000), and *Remote* areas (4.1 per 100,000). No audiologists lived in *Very remote* areas (Figure 6.1b).

Figure 6.1: Audiologists in Australia, 2016



Notes:

1. In these figures, population refers to the total Australian population, not the Indigenous Australian population.
2. Data for these figures are available in the supplementary tables.

Source: AIHW analysis of ABS 2016 Census of Population and Housing.

Membership of professional bodies

To provide government-funded audiological services – including HSP, Medicare and NDIS – audiologists must be certified by a professional body as an Audiology Australia Accredited Audiologist or Australian College of Audiology Full Member Audiologist. As of 30 June 2019, Audiology Australia reported 2,907 members (Audiology Australia 2019). As of 30 June 2020, the Australian College of Audiology reported 634 members (Audiology Australia 2021). As well as accredited audiologists, members can include students, other affiliates and, for the Australian College of Audiology, audiometrists. Therefore, the number of accredited audiologists in these professional bodies will be smaller than the number of members reported.

6.2 Ear, nose and throat specialists

Otolaryngologists, colloquially referred to as ENTs, are specialist surgeons who investigate and treat conditions involving the ear, nose, throat, head and neck. The data in this section are from the NHWD.

Box 6.3 What is the full-time equivalent rate?

Full-time equivalent (FTE) is a measure of the number of standard-hour workloads worked by employed health practitioners. It provides a useful measure of supply as it accounts for the number of practitioners working and the hours they work.

FTE is calculated on the total hours worked in a standard working week. For medical practitioners this is assumed to be 40 hours.

The number of FTE practitioners per 100,000 population is a measure of supply. By defining supply this way, meaningful comparisons can be made across geographic areas and over time. The FTE rate is calculated as the number of FTE practitioners divided by the relevant population count, multiplied by 100,000.

Overall: In 2019, 475 ENT specialists were employed in Australia, with an FTE of 540 (2.1 FTE per 100,000 population). The mean number of hours worked per week was 45.5.

The Australian Society of Otolaryngology Head and Neck Surgery (ASOHNS) members are ENT specialist surgeons. ASOHNS registrations report 2 members who identify as Indigenous Australians (ASOHNS, unpublished).

Age: Most (62%) ENT specialists were aged 35–54 (193 specialists, 362 FTE) and 21% (100 specialists, 80 FTE) aged 65 and over.

Sex: Approximately 16% ENT specialists were female (75 specialists, 83 FTE) and 84% male (400 specialists, 457 FTE).

State/territory: The highest proportion of ENT specialists were in New South Wales, with 33% (157 specialists, 181 FTE) indicating that state their principal place of practice. South Australia had the highest rate of ENT specialists (2.7 FTE per 100,000 population) (Figure 6.2).

Remoteness area: Over 4 in 5 ENT specialists' principal place of practice were in *Major cities* (84%, 401 ENT specialists, 459 FTE).

Job setting: Approximately 379 ENT specialists (80%, 433.5 FTE) reported their principal work setting to be in private practice. A total of 317 (67%) who were practising reported working a mix of private and public clinical hours, 129 (27%) private clinical hours only and 27 (6%) public clinical hours only.

Time trend: The number of ENT specialists employed in Australia increased slightly from 420 (484 FTE) in 2013 to 475 (540 FTE) in 2019. Over the same period, the rate per 100,000 population of ENT specialists remained stable at approximately 2.1 (Table 6.1).

Table 6.1: ENT specialists (number) employed in Australia, number and FTE, 2013 to 2019

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------|-------|-------|-------|-------|-------|-------|-------|
| N ENT specialists | 420 | 427 | 443 | 459 | 455 | 458 | 475 |
| FTE ENT specialists | 484.3 | 478.2 | 499.1 | 525.1 | 529.9 | 515.7 | 540.0 |
| FTE per 100,000 | 2.1 | 2.0 | 2.1 | 2.2 | 2.2 | 2.1 | 2.1 |

Note: Medical practitioners employed in Australia with the surgical specialisation of otolaryngology.

Source: AIHW analysis of the National Health Workforce Dataset.

Figure 6.2: ENT specialists, FTE per 100,000 population and number, by state/territory of work, 2019



Note: Data for these figures are available in the supplementary tables.

Source: AIHW analysis of the National Health Workforce Dataset.

6.3 Ear and hearing health specialist services in Indigenous-specific primary health-care organisations

In 2019–20, 113 (58%) of Indigenous-specific primary health-care organisations reporting data to the AIHW Online Services Report database collection (OSR) either employed or had a visiting audiologist or audiometrist. Since 2013–14, the proportion of Indigenous-specific primary health-care organisations with an audiologist or audiometrist doubled; from 28% to 58% in 2019–20.

A smaller proportion of Indigenous-specific primary health-care organisations had an ENT specialist. In 2019–20, 63 (32%) of such organisations reporting data to the OSR employed or had visiting ENT specialists. Since 2013–14, the proportion with an ENT specialist increased 2.7 times, from 12% to 32% in 2019–20.



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Ear and hearing health of Aboriginal and Torres Strait Islander children

7 Ear and hearing health of Aboriginal and Torres Strait Islander children



What do we know?

Indigenous children are disproportionately affected by middle ear disease, particularly otitis media, and associated hearing loss. They experience it earlier, more frequently and more severely compared with other Australian children. Timely diagnosis and treatment are critical.

The extent of children's ear and hearing health problems and use of services

- In 2018–19, around 3 in 10 (29%) Indigenous children aged 7–14 had measured hearing loss in one or both ears.
- In 2019–20, over one in 4 (73,000, 26%) Indigenous children aged 0–14 had an ear check as part of an Indigenous-specific health check.
- Over 4,500 hospitalisations took place for Indigenous children aged 0–14 for ear or hearing problems between July 2018 and June 2020 (8.1 per 1,000 population).
- Between 2008 and 2019, 3,300 Indigenous children aged 0–14 were fitted with a hearing aid or cochlear implant through Hearing Australia. Over this period the proportion of aided Indigenous children aged 0–14 first fitted with a hearing aid when aged 0–5 increased from 21% to 45%.

Indigenous children experience some of the highest rates of ear disease and associated hearing loss in the world. In some Indigenous communities the prevalence of chronic suppurative otitis media (runny ears) is 10 times the World Health Organization's public health emergency threshold of 4% (Burns & Thomson 2013; WHO 2004). Kong and Coates (2009) found that 'Indigenous children in remote and urban settings tend to suffer otitis media earlier, more frequently and severely, and with more serious complications than non-Indigenous children'.

Poor ear and hearing health is a serious problem that can profoundly affect a child throughout their life. The key developmental period for language, listening and higher cognitive functioning occurs during the first few years of life and extends into adolescence. Higher rates of hearing loss associated with otitis media for Indigenous children aged 6–24 months and 4–5 years overlaps with this critical developmental period (Burns & Thomson 2013).

Poor hearing can impede cognitive development, auditory processing skills, and speech and language development, resulting in poor attention and listening (Burns & Thomson 2013; Burrow et al. 2009; Williams & Jacob 2009). Hearing loss can also have an impact on social and emotional wellbeing. It can lead to behavioural problems, such as irritability and disobedient behaviour. This, in turn, can lead to social isolation, problems with school attendance and early school-leaving (Burrow et al. 2009).

These compounding problems can have life-long negative social consequences for the child, their families and communities. Examples include limited employment options and income, increased antisocial behaviours, and increased contact with the criminal justice system (Burns & Thomson 2013; Burrow et al. 2009).

Although time critical, a child's pathway through the ear and hearing health system can be complex and take substantial time to receive treatment, including wait times for referrals, hearing assessments, ENT consults and surgery (Australia Hearing 2021). Box 7.1 presents 2 case studies of young children's pathways through the ear and hearing health system.

Box 7.1: A young patient's pathway to better ear health

As part of the consultation process for this report, ACCHS Child ear and hearing health experts were given the opportunity to provide case studies describing patients' experiences with the ear and hearing health system, and pathways through these systems. These 2 case studies illustrate some of the issues.

Case study 1

During our visit to [a local Aboriginal] Preschool our Ear and Hearing team detected ongoing Otitis Media in a child with a mild to moderate conductive hearing loss. The family then attended an audiology appointment at [the local ACCHS]. The middle ear function and hearing had not improved and the family and the preschool began noticing behavioural issues and speech delay compared to other classmates.

The family preferred to go to their own GP...as it was closer to home. That GP referred them to [the hospital] as a public patient. The family then received a letter from the hospital saying they were a Category 2 patient, and the wait would be 12 months or longer. When I rang and spoke to the ENT nurse, she said the wait would be closer to 2 to 3 years.

This would mean that for the child's critical period of development they would have an ongoing hearing loss detrimental to speech and language acquisition but also affecting learning, concentration, focus, frustration, socialisation and communication. Hearing aids were offered from Hearing Australia [a statutory authority that provides government subsidised hearing services] but the family was not keen.

We arranged for them to see [one of our] GPs who referred them to a private ENT who had offered to bulk bill a limited number of our clients that year. The child was seen for an initial ENT consultation and was then booked in for grommet insertion within 10 weeks.

[After the surgery] hearing levels returned to normal and the family could not believe the positive change in their child.

Case study 2

A parent rang our social health team..., concerned about their 4 year old child's hearing and speech development. The family had noticed that they were very loud, liked the volume up and did not answer when called.

At an appointment with our audiologist...the child was found to have a significant moderate hearing loss in both ears with glue ear or Otitis Media. According to the Otitis Media guidelines we monitored the situation for three months. In the meantime, the family were referred to our local Hearing Australia office for amplification options. They received a bone conductor hearing aid for the child to wear while we concurrently arranged ENT advice.

Also, a referral to [a government-funded early childhood intervention service] was arranged for a fully funded speech and language assessment. Further speech therapy sessions were arranged via this service at no cost to family.

[Using outreach program funding] we arranged a private ENT for a consultation and later for grommet surgery. The cost of everything was covered by [the funding]. The waitlist as a public patient at the local public hospital was several years long.

At their follow up appointment, the grommets were working well, hearing had returned to normal, and the family were thrilled with their progress at preschool. The family were able to keep the hearing device in case there was another episode of Otitis Media with hearing loss.

Reporting on the ear and hearing health of Aboriginal and Torres Strait Islander children

Given the high rates of ear disease and long-term developmental impacts of even short-term ear or hearing problems in children, a national approach to measuring and reporting on Indigenous children's ear and hearing health is required. To address this, the former Australian Health Ministers Advisory Council (now the Health Ministers Forum) commissioned the development of a proposal for Ear and Hearing Health Performance Indicators, specifically to improve Indigenous children's ear and hearing health.

The AIHW under the guidance of the National Aboriginal and Torres Strait Islander Hearing Health Advisory Panel proposed a framework of actions to comprehensively improve ear and hearing health in Indigenous children, including development of key performance indicators (Queensland Health & AIHW unpublished).

Along with recommendations on the indicators and support areas, the panel recommended annual reporting of readily available data on hospital treatment and interventions for Indigenous children with ear disease and hearing loss.

The panel comprised Indigenous Australians, ear and hearing health clinicians, and representatives from primary health care, Australian Government and state and territory health departments, and research institutions.

This chapter presents data on ear and hearing health among Indigenous children aged under 15. Where possible, data are presented by 5 year or single year age groups. This chapter was guided by the panel's recommendations. Information and data sources included in this chapter are in Table 7.1.

Table 7.1 Ear and hearing health of Aboriginal and Torres Strait Islander children

| Measures | Data source | Latest year of reporting |
|--|-------------------|--------------------------|
| 7.1 Prevalence | | |
| Measured hearing loss | NATSIHS | 2018–19 |
| Reported ear and hearing problems | NATSIHS | 2018–19 |
| Comparing measured and reported hearing loss | NATSIHS | 2018–19 |
| Information on prevalence from programs | | |
| 7.2 Ear and hearing health checks | | |
| Indigenous-specific health checks | MBS | 2019–20 |
| Hearing Assessment Program – Early Years (HAPEE) | Hearing Australia | 2019–20 |
| 7.3 Emergency department presentations | | |
| Emergency department presentations for ear or hearing-related problems | NNAPEDCD | 2018–20 |
| 7.4 Hospital admissions | | |
| Hospital admissions for diseases of the ear and mastoid process | NHMD | 2018–20 |
| Middle ear-related procedures | NHMD | 2018–20 |
| Adenoidectomy procedures | NHMD | 2018–20 |
| 7.5 Hearing aids and cochlear implants | | |
| Hearing Australia clients fitted with hearing devices | Hearing Australia | 2019 |
| Age of first fitting | Hearing Australia | 2019 |

7.1 Prevalence

7.1.1 Measured hearing loss

Measured hearing loss provides an indication of how many children may be affected by hearing loss at any point. In 2018–19, a voluntary hearing test in the ABS NATSIHS measured hearing loss among Indigenous children aged 7–14.

Overall: Among Indigenous children aged 7–14, an estimated 29% (or 42,200 Indigenous children) had hearing loss in one or both ears:

- 16.5% had hearing loss in one ear only
- 7.3% had mild hearing impairment
- 2.6% had moderate hearing impairment
- 2.3% had severe or profound hearing impairment.

Sex: Measured hearing loss was more common among Indigenous girls (35%) than Indigenous boys (23%) (Figure 7.1a).

Remoteness area: In *Remote and very remote areas*, 40% of Indigenous children aged 7–14 had measured hearing loss, compared with 31% in *Inner and outer regional areas* and 23% in *Major Cities* (Figure 7.1b).

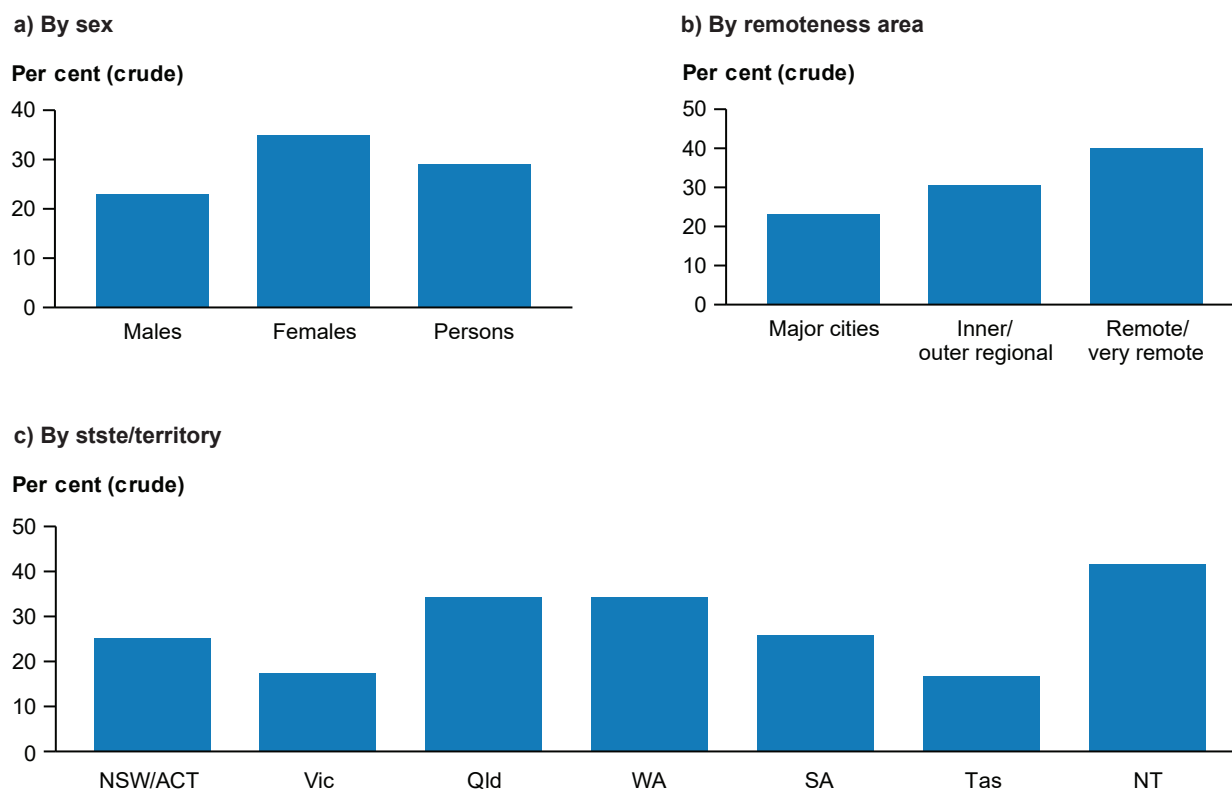
State/territory: The rate of measured hearing loss varied across states and territories. It was highest in the Northern Territory (42%) and lowest in Tasmania and Victoria (17 in each%) (Figure 7.1c).

Box 7.2 Signs and symptoms of otitis media in children

In young children signs of otitis media can include: a child pulling at their ears; fever; a complaint of ear pain; discharge from the ear; dizziness or clumsiness; congestion related to a cold or a child being unusually grizzly and grumpy. In older children signs might include: decreased alertness; asking people to repeat things; asking to turn sounds up; boredom; watching others for cues; poor concentration and behavioural problems.

Children can also have otitis media with no symptoms and often there are no obvious signs of otitis media, especially in very young children. This is why early and regular screening checks for children are key to preventing hearing loss. (AIHW 2021h).

Figure 7.1: Measured hearing loss among Indigenous children aged 7–14, by selected characteristics, 2018–19



Note: Data for these figures are available in the supplementary tables.

Source: AIHW analysis of ABS National Aboriginal and Torres Strait Islander Health Survey 2018–19.

7.1.2 Reported ear or hearing problems

Overall: In 2018–19, based on reported data from the ABS NATSIHS, an estimated 6.9% (19,100) of Indigenous children aged 0–14 had a long-term ear or hearing problem. This comprised 3.8% of Indigenous children with total or partial deafness, 2.6% with otitis media, and 0.5% with other diseases of the ear.

Compared with non-Indigenous children, Indigenous children were:

- more than twice as likely to report an ear or hearing problem (6.9% compared with 3.0% respectively)
- 3 times as likely to have otitis media (2.6% compared with 0.9% respectively) (AIHW 2021f).

Age: Indigenous children aged 5–9 or 10–14 were more likely than those aged 0–4 to report an ear or hearing problem (7.8%, 7.4% and 5.4% respectively) (Figure 7.2a).

Sex: The rate of reported ear or hearing problems was slightly higher among Indigenous boys (7.4%) than Indigenous girls (6.4%).

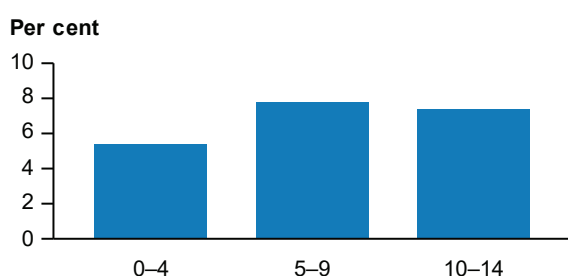
State/territory: The rate of Indigenous children aged 0–14 reporting ear or hearing problems was highest in Western Australia (9.0%) and Tasmania (8.1%). It is lowest in Victoria (5.7%) and combined New South Wales and the Australian Capital Territory (5.9%) (Figure 7.2b).

Time trend: The rate of Indigenous and non-Indigenous children reporting ear or hearing problems decreased between 2001 and 2018–19. However, Indigenous children were consistently 2 to 3 times as likely to report an ear or hearing problem as non-Indigenous children (Figure 7.2c).

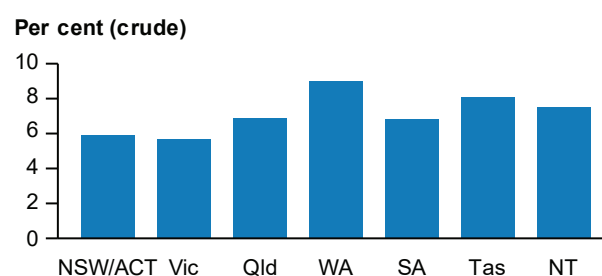
Remoteness area: The rate of ear or hearing problems was similar in *Major cities* (6.3%) and *Inner and outer regional areas* (6.7%). It was higher in *Remote and very remote areas* (9.7%). The rate of ear or hearing problems in *Remote and very remote areas* has decreased over time, from 18% in 2001 to 9.7% in 2018–19. Rates in *Major cities* and *Inner and outer regional areas*, also decreased from 8.5% to 6.4% during this period (Figure 7.2d).

Figure 7.2: Reported long-term ear and hearing problems for children aged 0–14, by selected characteristics

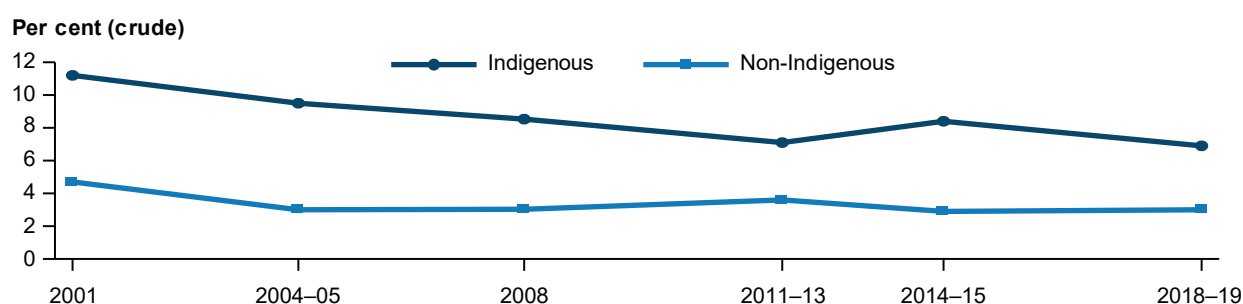
a) Indigenous, by age, 2018–19



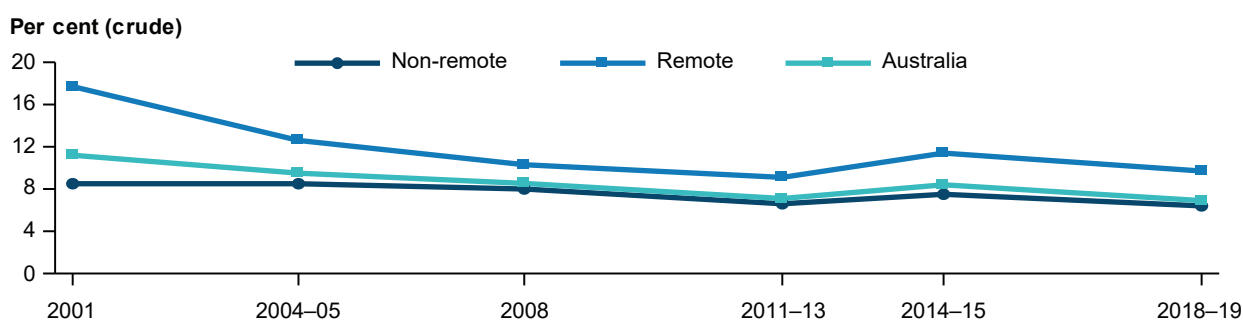
b) Indigenous, by state/territory, 2018–19



c) By Indigenous status, 2001 to 2018–19



d) Indigenous, by remoteness area, 2001 to 2018–19



Notes:

1. In Figure (d) 'Remote' includes *Remote* and *Very remote* areas. 'Non-remote' includes *Major cities*, *Inner regional* and *Outer regional* areas.
2. Data for these figures are available in the supplementary tables.

Sources: AIHW analysis of ABS National Health Survey 2001, National Aboriginal and Torres Strait Islander Health Survey 2004–05, National Health Survey 2004–05, National Aboriginal and Torres Strait Islander Social Survey 2008, National Health Survey 2007–08, Australian Aboriginal and Torres Strait Islander Health Survey 2012–13, Australian Health Survey 2011–12, National Aboriginal and Torres Strait Islander Social Survey 2014–15, National Health Survey 2017–18, and National Aboriginal and Torres Strait Islander Health Survey 2018–19.

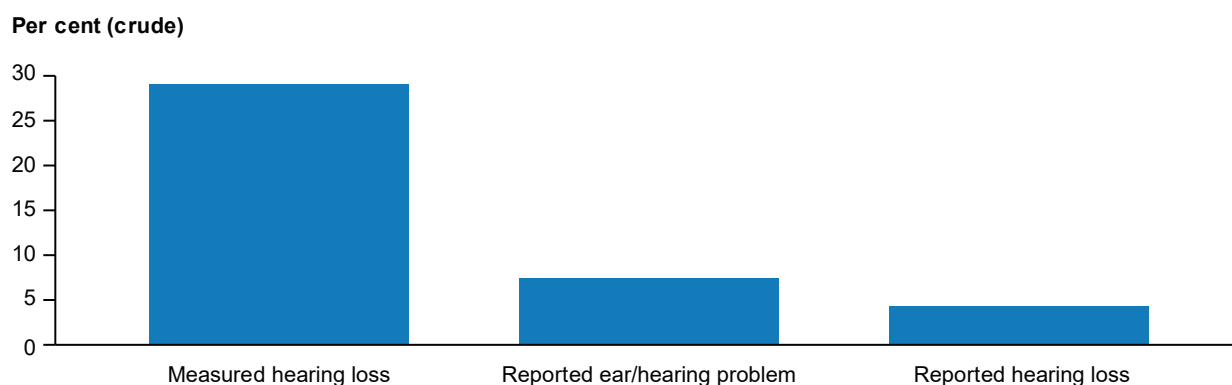
7.1.3 Comparing measured and reported hearing loss

Measuring the proportion of people with measured hearing loss who did not report hearing loss can assist in identifying the degree to which hearing loss may be under-reported among Indigenous Australians (ABS 2020). The reported data in this section focuses on children aged 7–14 who reported long-term deafness or hearing loss in one or both ears. It excludes people who reported other ear conditions, such as otitis media, which may cause short-term hearing loss.

In 2018–19, among Indigenous children aged 7–14:

- 29% had measured hearing loss
- 4% reported hearing loss
- 2% had both measured and reported hearing loss
- 27% had measured hearing loss and did not report hearing loss (Figure 7.3).

Figure 7.3: Measured hearing loss and reported ear and hearing problems among Indigenous children aged 7–14, 2018–19



Notes:

1. Reported hearing loss is a sub-group of reported ear or hearing problem. Reported ear or hearing problem and reported hearing loss are not a sub-group of measured hearing loss.
2. Data for these figures are available in the online supplementary tables.

Source: AIHW analysis of ABS National Aboriginal and Torres Strait Islander Health Survey 2018–19.

7.1.4 Information on prevalence from hearing health programs

In addition to national data on measured hearing loss from NATSIHS, some state and territory level program level data are available. Data in this section comes from Queensland's Deadly Ears Program and the National Partnership on Northern Territory Remote Aboriginal Investment.

Deadly Ears collects information on 'minimum prevalence'. This is the number of children who attended a Deadly Ears service and were found to have an ear condition expressed as a proportion of the total eligible population. Between 2015 and 2017, 13% of the eligible Indigenous population aged 0–14 accessed a Deadly Ears service and was found to have had an ear condition. The estimated minimum prevalence of eligible children with an ear condition varied by age: 11% aged 0–4, 20% aged 5–9, and 8% aged 10–14 (AIHW 2021h).

In 2020, 1,802 Indigenous children and young people aged under 16 received hearing health outreach services through the National Partnership on Northern Territory Remote Aboriginal Investment (NTRAI). Among Indigenous children in the NTRAI program who had at least one ear condition, one in 2 experienced hearing loss (AIHW 2021b)

7.2 Ear and hearing health checks

7.2.1 Indigenous-specific health checks

All Indigenous children are eligible for an annual Indigenous-specific health check through Medicare (more information: Section 4.2 Indigenous-specific health checks). For Indigenous Australians aged under 15, the health assessment must include an ear examination with otoscopy – the inspection of the outer and middle ear for signs of inflammation, discharge, infection or other issues using an otoscope.

The Indigenous-specific health check is an annual opportunity for Indigenous children to have their ears checked. Many will also have their ears checked at other times, outside these health checks. This means that the number of Indigenous children receiving an Indigenous-specific health check provides estimates of the minimum number who have had their ears checked. Data in this section comes from Medicare Benefits Scheme (MBS) data.

Overall: In 2020–21, one in 4 (73,000, 26%) Indigenous children aged 0–14 had an Indigenous-specific health check.

Age: The proportion of Indigenous children who had a health check was higher for children aged 0–4 than children aged 5–14 (29% and 24% respectively) (Figure 7.4a).

Sex: The proportion of Indigenous children aged 0–14 who had a health check was similar for boys (27%) and girls (25%) (Figure 7.4a).

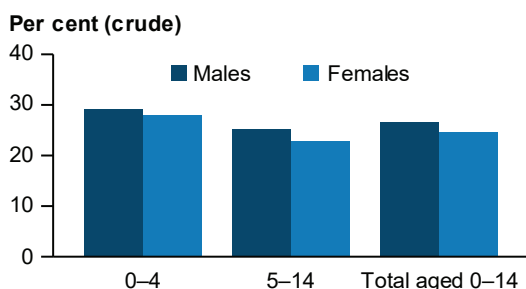
Remoteness area: The proportion of Indigenous children aged 0–14 who had a health check was highest in *Remote* areas (32%) and *Outer regional* areas (30%). The proportion was lowest in *Major cities* (23%) (Figure 7.4b).

State: The proportion of Indigenous children aged 0–14 who had a health check was highest in the Northern Territory and Queensland (each 33%). It was lowest in Tasmania (10%) (Figure 7.4c).

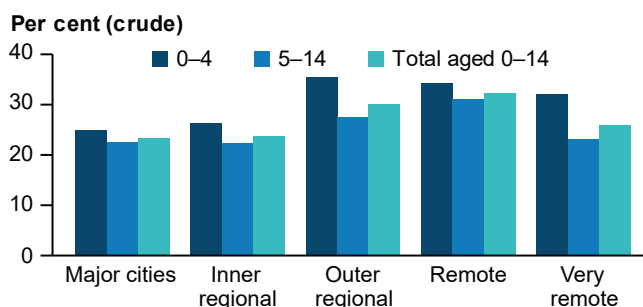
Time trend: From 2010–11 to 2018–19, the proportion of Indigenous children aged 0–14 who had a health check tripled from 9% to 28%. The proportion then dropped slightly to 26% in 2020–21 (Figure 7.4d).

Figure 7.4: Indigenous-specific health checks among Indigenous children aged 0–14, by selected characteristics

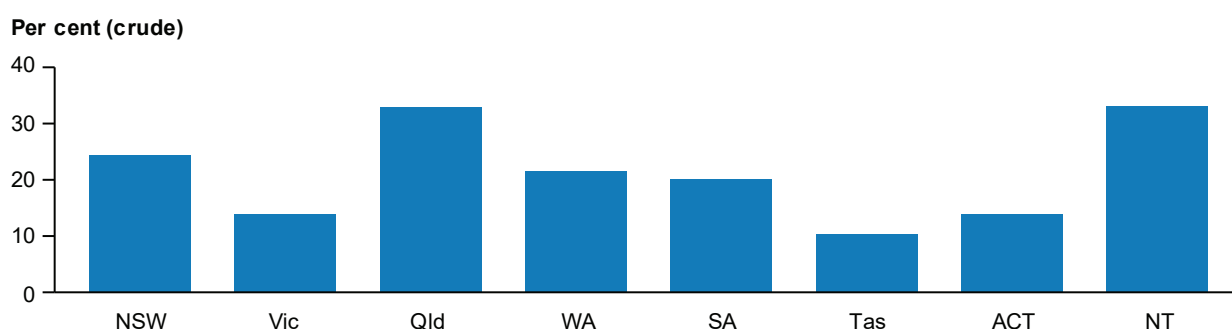
a) By age and sex, 2020–21



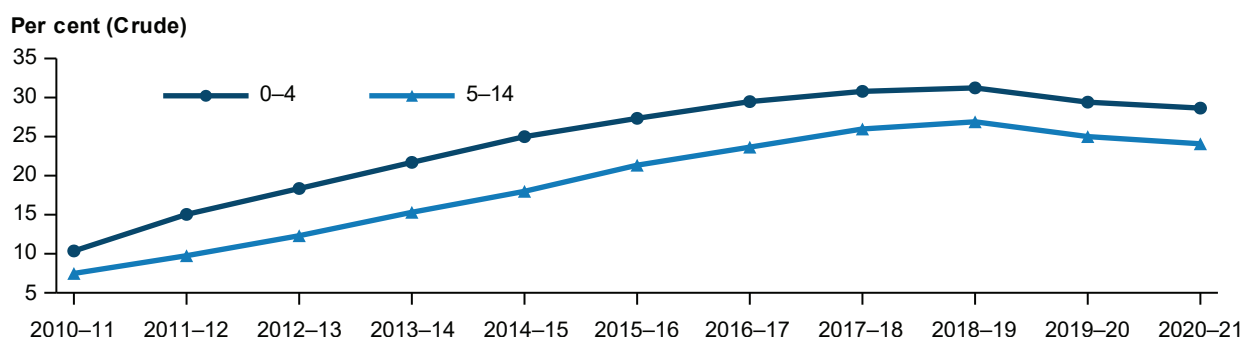
b) By remoteness area and age, 2020–21



c) By state/territory, 2020–21



d) By age, 2010–11 to 2020–21



Notes:

1. Data for 2019–20 and 2020–21 includes telehealth assessments.
2. Data for these figures are available in the supplementary tables.

Source: AIHW analysis of MBS data.

7.2.2 Hearing Assessment Program – Early Ears

To address the high levels of ear disease and associated hearing loss among Indigenous children, the Australian Government provides funding for HAPEE, led by Hearing Australia. HAPEE provides free ear health checks and diagnostic hearing assessments to Indigenous children aged 0–6 who do not yet attend full-time school. This section presents data from Hearing Australia on assessments and results for children receiving HAPEE services in 2019–20. Data are presented for the number of Indigenous children receiving HAPEE services. Children may receive multiple assessments through the HAPEE program, so the number of services provided is not the same as the number of children assessed. More information: Appendix C.

Ear health checks and diagnostic assessments

Overall: In 2019–20, 5,300 ear health checks and diagnostic hearing assessments were provided to 3,200 Indigenous children aged under 6 (28 per 1,000 population).

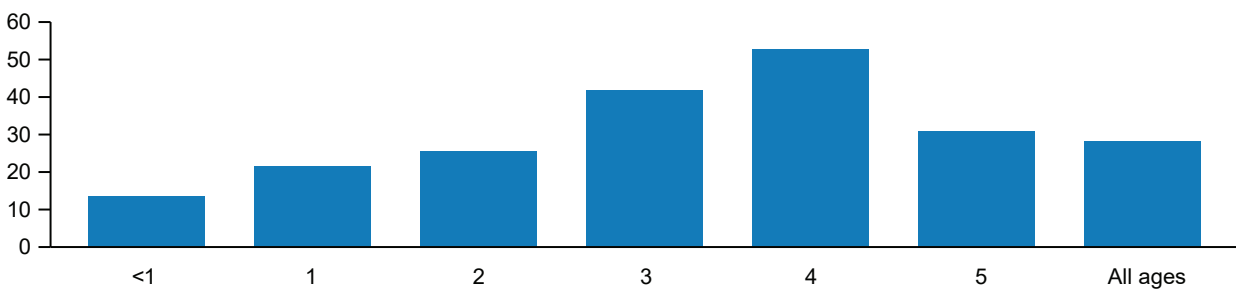
Age: The rate of Indigenous children receiving at least one assessment was highest among those aged 4 years (991 children, 53 per 1,000 population) (Figure 7.5a).

State/territory: The Northern Territory had the highest rate of assessments (59 per 1,000 population), followed by Queensland (37 per 1,000 population) (Figure 7.5b). HAPEE initially focused on Indigenous children in rural and remote areas. Over time it expanded to include Indigenous children in all areas, with regional and remote continuing to be priority locations. The initial focus meant no services were provided in the ACT during the reporting period 2019–20.

Figure 7.5: HAPEE ear health checks and diagnostic assessments among Indigenous children aged under 6, 2019–20

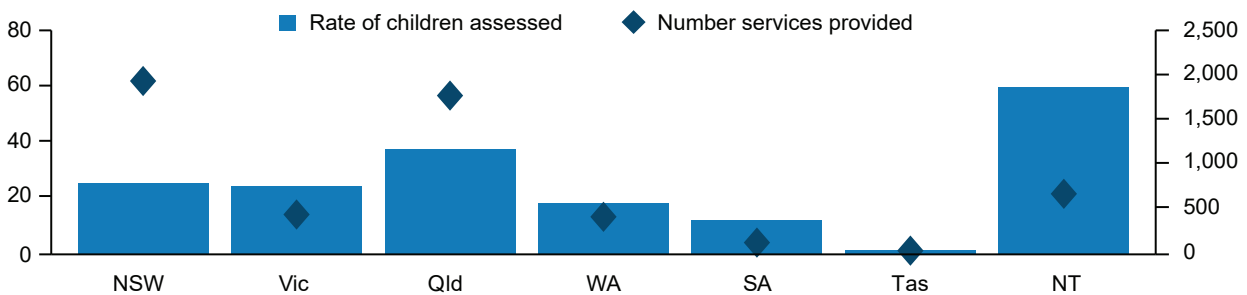
a) By age

Per 1,000 (crude)



b) By state/territory

Per 1,000 (crude)



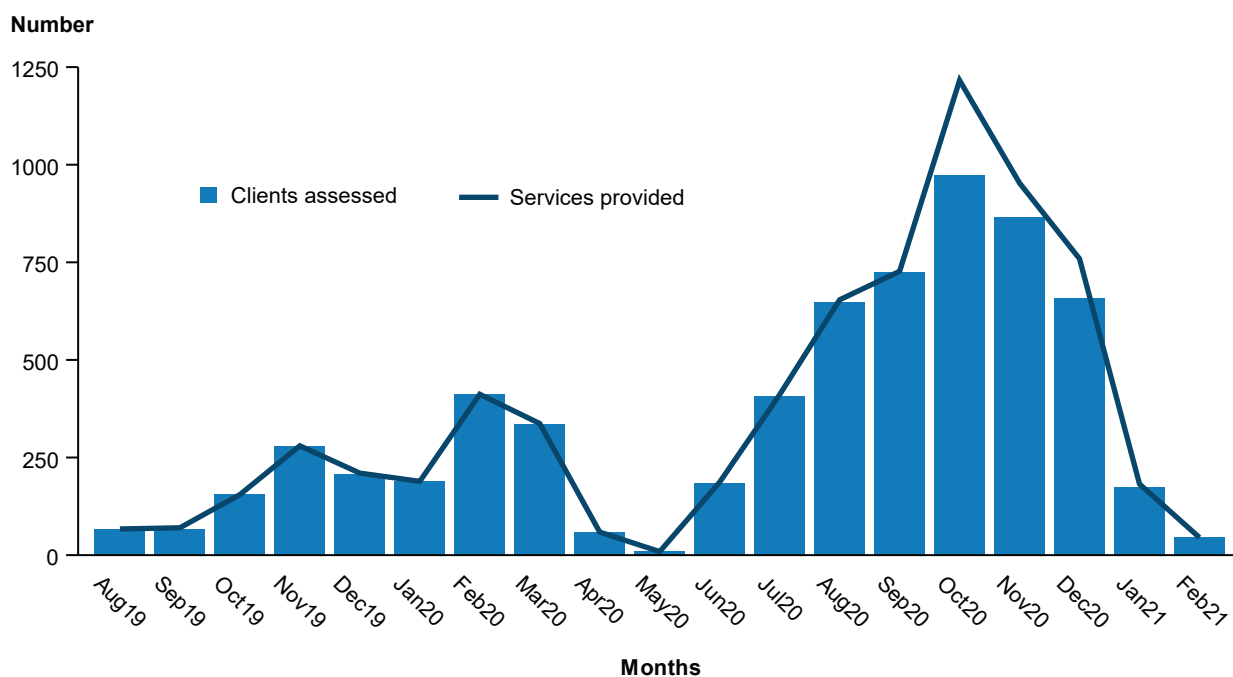
Notes:

1. As children may receive multiple assessments, the number of services provided is not the same as the number of children assessed.
2. Data for this figure are available in the supplementary tables.

Source: AIHW analysis Hearing Australia 2020 data.

The COVID-19 pandemic had a marked impact on the provision of hearing assessment services. Most services ceased by the end of March 2020, with limited services provided by telehealth, mainly in Queensland. South Australia and Western Australia experienced the greatest disruption due to restrictions on visiting remote communities and lack of available audiologists (Hearing Australia 2020). Face-to-face services began again in June 2020 with a substantial increase from July 2020 (Figure 7.6).

Figure 7.6: Time series, number of clients assessed, and services provided, Indigenous children aged under 6, August 2019 to February 2021



Note: Data for these figures are available in the supplementary tables.

Source: AIHW analysis of data from Hearing Australia 2020

Diagnosed hearing impairment

Overall: In 2019–20, 711 Indigenous children aged under 6 (22%) receiving a diagnostic assessment had a hearing impairment, 636 (20%) a mild hearing impairment, and 75 (2.3%) a moderate or greater hearing impairment.

Age: Among Indigenous children aged under 6 who received a diagnostic hearing assessment, older children were more likely to have a hearing impairment (Figure 7.7a):

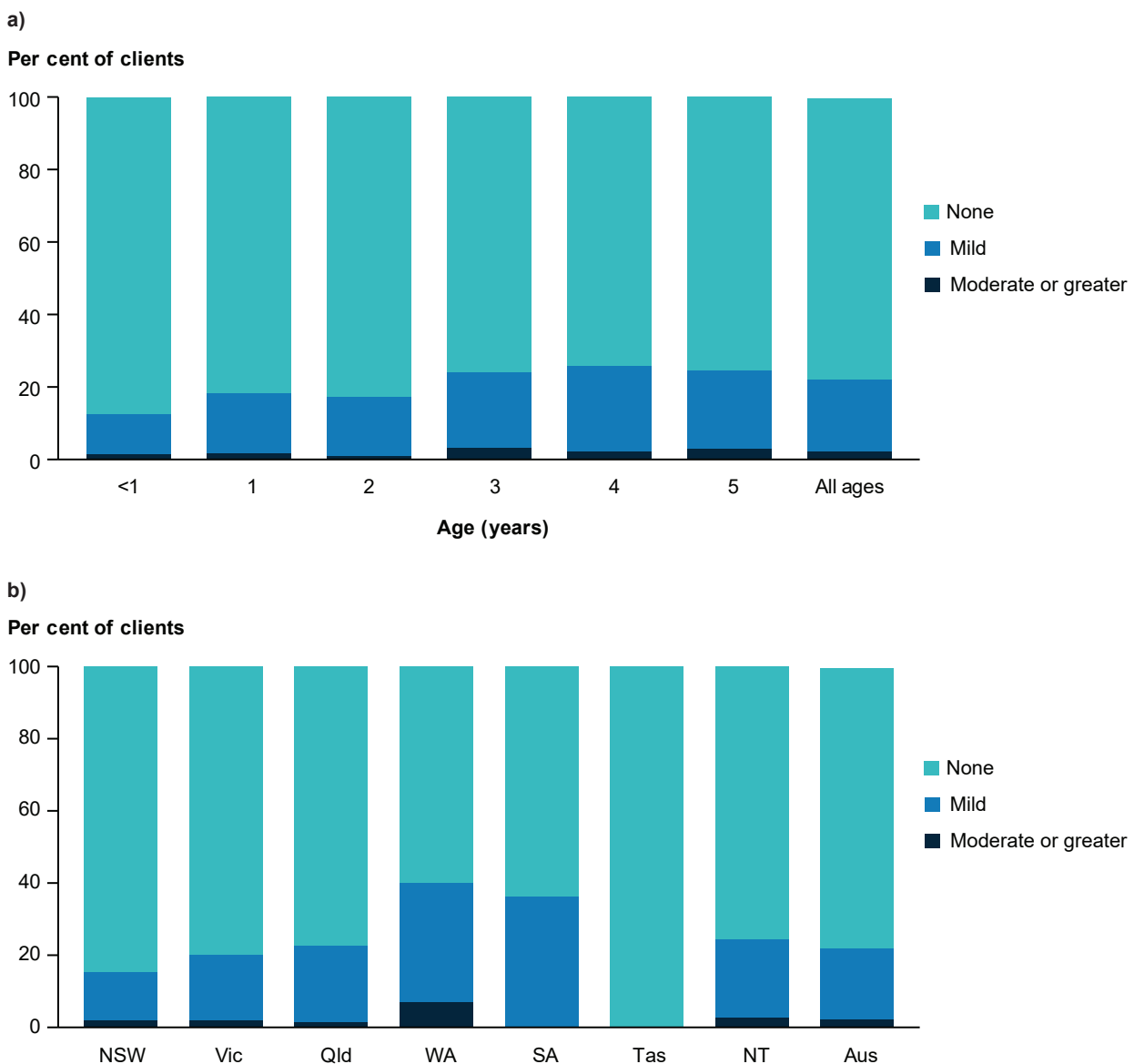
- 13% aged under one year had a hearing impairment
- 26% aged 4 years and 25% aged 5 years had a hearing impairment
- 3% aged 5 years had the highest rate of moderate or greater hearing loss.

Sex: Overall rates of hearing impairment among children receiving a diagnostic assessment were very similar between Indigenous boys (21%) and Indigenous girls (20%), with no difference found in rates of mild or moderate or greater hearing impairment.

Jurisdiction: Western Australia had the highest rate of hearing impairment among those who received a diagnostic assessment (40%), followed by South Australia (36%) and the Northern Territory (24%). Severity of hearing impairments among children was similar across most jurisdictions. Exception are:

- Western Australia and South Australia had the highest rates of mild hearing loss at 33% and 36% respectively.
- Western Australia had the highest rate of Indigenous children screened with moderate or greater hearing impairment (7.0%). All other states and territories had rates at or below 2.8% (Figure 7.7b).

Figure 7.7: Indigenous children aged under 6 receiving diagnostic assessment, by level of severity and selected characteristics, 2019–20



Notes:

1. Excludes children whose hearing loss was unable to be determined.
2. Proportion for Tasmania not comparable due to small sample size. Data not available for the Australian Capital Territory.
3. Data for these figures are available in the supplementary tables.

Source: AIHW analysis of Hearing Australia 2020 data.

7.3 Emergency department presentations

Children may present at an emergency department for ear disease due to the severity of the ear disease or because of lack of access to, or awareness of, primary health-care services.

This section examines the number of emergency department presentations made by Indigenous children aged 0–14 with a principal diagnosis of ear disease or hearing loss. More information: Section 4.4 Emergency department presentations.

Overall: Between July 2018 and June 2020, 9,400 presentations were made to the emergency department for ear or hearing-related problems by Indigenous children aged 0–14 (17 per 1,000 population). The rate of ear or hearing-related presentations among Indigenous children was 2.6 times the rate among non-Indigenous children (6 per 1,000 population).

Age: The rate of ear or hearing-related emergency department presentations decreased with age, from 26 per 1,000 population for Indigenous children aged 0–4 to 8.5 per 1,000 population among children aged 10–14 (Figure 7.8a).

Sex: The rate of ear or hearing-related emergency department presentations was similar for Indigenous girls and Indigenous boys aged 0–14 (17 per 1,000 population for both).

Remoteness area: The rate of ear or hearing-related emergency department presentations for Indigenous children aged 0–14 generally increased with remoteness, from 8.3 per 1,000 population in *Major cities*, to 46 per 1,000 population in *Remote* areas (Figure 7.8b).

State/territory: The rate of ear or hearing-related emergency department presentations for Indigenous children aged 0–14 was highest for residents of Western Australia (32 per 1,000 population) and the Northern Territory (28 per 1,000 population). It was lowest in Tasmania (3.9 per 1,000 population) (Figure 7.8c).

Time trend: Overall, between 2013–14 and 2019–20, the rate of emergency department presentations among Indigenous children aged 0–14 for ear or hearing-related problems increased (from 12 to 16 per 1,000 population).

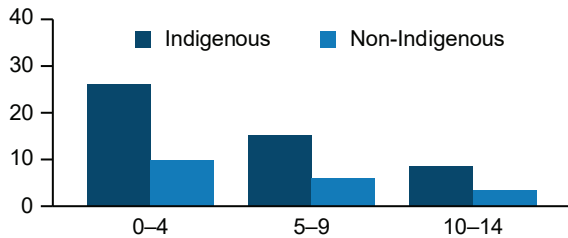
The increase in emergency department presentations between 2013–14 and 2019–20, was driven by the increase in presentations by Indigenous children aged 0–4, with the presentation rate increasing 34%. Presentation rates also increased 42% among Indigenous children aged 5–9, and 40% among those aged 10–14.

Across this same period, the presentation rate for non-Indigenous children aged 0–14 remained steady at around 7.0 per 1,000 population, before dropping to 5.7 per 1,000 population in 2019–20. The gap in emergency department presentation rates between Indigenous and non-Indigenous children aged 0–14 increased over this period (rate differences of 4.1 in 2013–14 and 10 in 2019–20) (Figure 7.8d).

Figure 7.8: Emergency department rates for ear or hearing problems among children aged 0–14, by selected characteristics

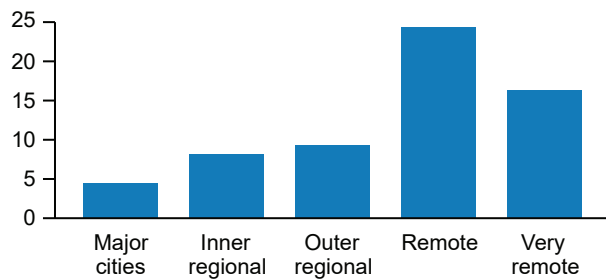
a) By age and Indigenous status, 2018–20

Per 1,000 (crude)



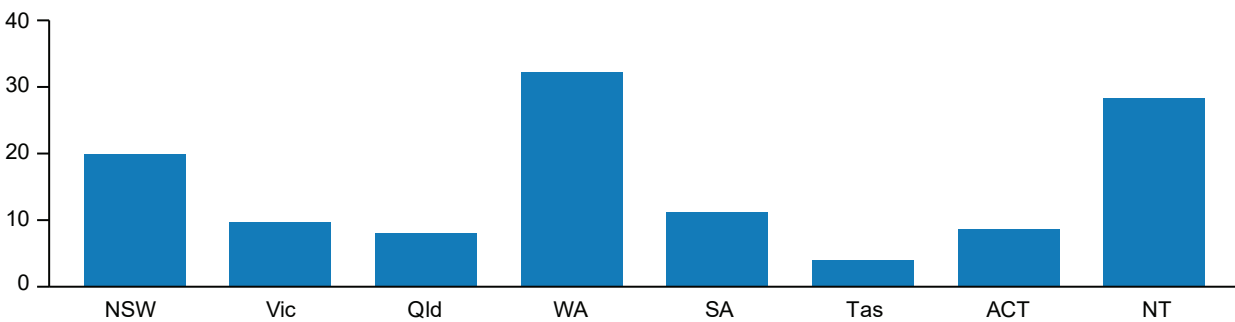
b) Indigenous, by remoteness area, 2018–20

Per 1,000 (crude)



c) Indigenous, by state and territory, 2018–20

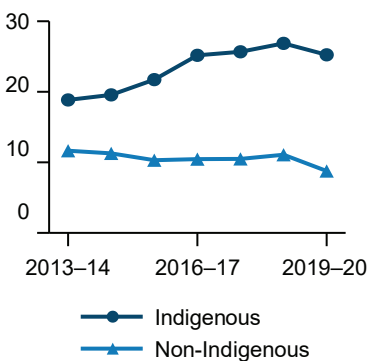
Per 1,000 (crude)



d) Time trend, by Indigenous status and age, 2013–14 to 2019–20

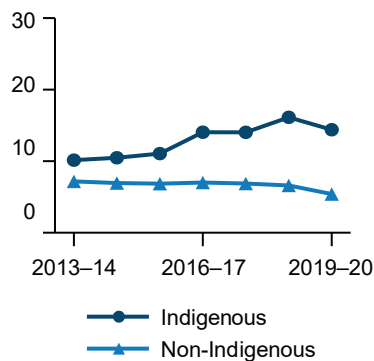
i) 0–4 year olds

Per 1,000 (crude)



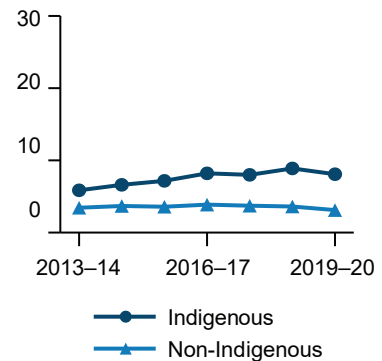
ii) 5–9 year olds

Per 1,000 (crude)



iii) 10–14 year olds

Per 1,000 (crude)



Note: Data for these figures are available in the online supplementary tables.

Source: AIHW National Non-admitted Patient Emergency Department Care Database.

7.4 Hospital admissions

Information in this section on hospital admissions for diseases of the ear or mastoid process among Indigenous children aged 0–14 comes from the National Hospital Morbidity Database.

7.4.1 Hospitalisations for diseases of the ear and mastoid process

This section reports the number of hospitalisations for diseases of the ear or mastoid process among Indigenous children aged 0–14, unless otherwise specified. Reason for hospitalisation was determined using principal diagnosis (Section 5.1 Hospital admissions).

Overall: From July 2018 to June 2020, 4,500 hospitalisations for Indigenous children were due to ear or hearing-related problems (8.1 per 1,000 population). Middle ear disease accounted for 9 in 10 of these (89%, 4,000 hospitalisations). The hospitalisation rate for these problems was 1.4 times the rate among Indigenous than non-Indigenous children (rates of 8.1 and 5.9 per 1,000 population respectively).

Age: Younger Indigenous children aged 0–4 had the highest rate of hospitalisations for ear or hearing-related problems (12 per 1,000 population). Rates decreased with age (8.3 and 3.5 per 1,000 population for Indigenous children aged 5–9 and 10–14 respectively).

Hospitalisation rates were similar between Indigenous and non-Indigenous children aged 0–4 (12 and 11 per 1,000 respectively, rate ratio of 1.1). However, for children aged 5–9 and 10–14, rates were much higher for Indigenous children than non-Indigenous children (rate ratios of 1.7 and 2.5 respectively) (Figure 7.9a).

Sex: Indigenous boys were more likely than Indigenous girls to be hospitalised for ear or hearing-related problems (9.0 and 7.0 per 1,000 population respectively).

Remoteness area: The rate of ear or hearing-related hospitalisations among Indigenous children was higher in *Remote* (11 per 1,000 population) and *Very remote* areas (13 per 1,000 population), than in *Inner regional* (7.2 per 1,000 population), *Outer regional* (6.6 per 1,000 population) and *Major cities* (7.5 per 1,000 population; Figure 7.9b).

State/territory: The rate of ear or hearing-related hospitalisation was highest in Western Australia and the Northern Territory (12 and 10 per 1,000 population respectively). It was lowest in Tasmania (4.7 per 1,000 population; Figure 7.9c).

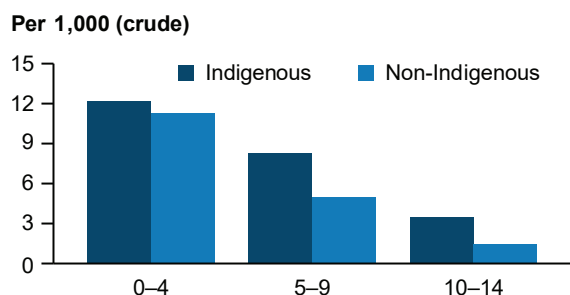
Time trend: Between 2010–11 and 2017–18, the ear or hearing-related hospitalisation rate among Indigenous children aged 0–14 increased (from 6.9 to 9.2 per 1,000 population) and then fell in 2019–20 (to 7.4 per 1,000 population). For non-Indigenous children, the hospitalisation rate decreased between 2010–11 and 2019–20 (from 7.7 to 5.3 per 1,000 population (Figure 7.9d).

Hospitalisation rates among Indigenous children aged:

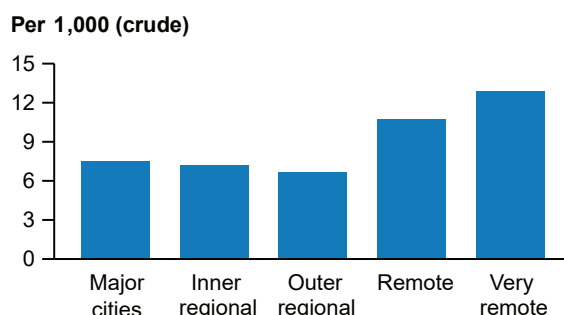
- 0–4, increased between 2014–15 and 2018–19 (8.9 and 13 per 1,000 population respectively), then decreasing slightly in 2019–20 (to 11 per 1,000 population).
- 5–9, increased between 2014–15 and 2017–18 (7.2 and 10 per 1,000 population respectively), then decreased in 2019–20 (7.7 per 1,000 population).
- 10–14, were stable between 2010–11 and 2017–18 (around 4.3 per 1,000 population), then decreased in 2019–20 (3.1 per 1,000 population).

Figure 7.9: Hospitalisation rates for ear and hearing problems among children aged 0–14, by selected characteristics

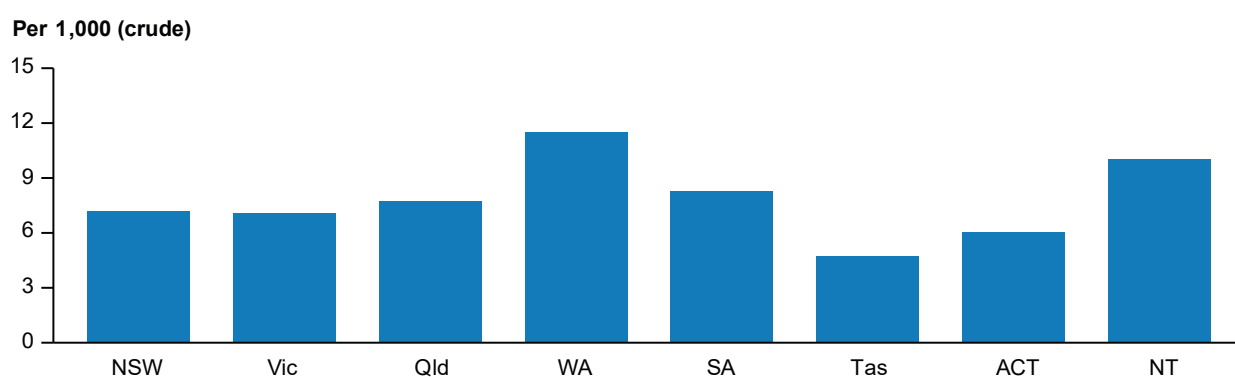
a) By age and Indigenous status, 2018–20



b) Indigenous, by remoteness area, 2018–20

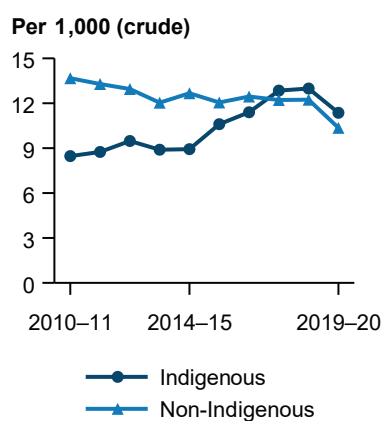


c) Indigenous, by state/territory, 2018–20

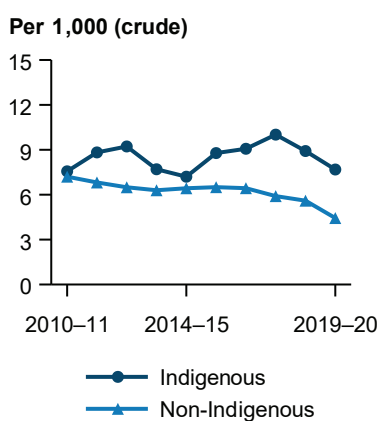


d) Time trend, by Indigenous status, 2010–11 to 2019–20

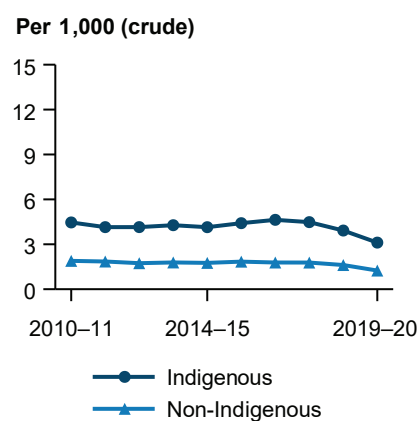
i) Children aged 0–4



ii) Children aged 5–9



iii) Children aged 10–14



Notes:

- Hospitalisations are categorised based on principal diagnosis.
- Data for these figures are available in the online supplementary tables.

Source: AIHW National Hospital Morbidity Database.

7.4.2 Middle ear-related procedures

This section examines all middle ear-related procedures occurring during hospitalisations with a principal diagnosis of middle ear disease. Middle ear procedures include surgical procedures such as myringotomy and myringoplasty, as well as non-surgical procedures such as removing foreign bodies from the middle ear and ear toileting. Surgical management of otitis media with the insertion of grommets or ventilation tubes (myringotomy with insertion of tube) is the second most common in-hospital surgical procedure for children. Data in this section cannot be directly compared with that in Section 5.1 Hospital admissions, because this section limits data to middle ear-related procedures rather than all ear or hearing related procedures.

Overall: From July 2018 to June 2020, 4,000 in-hospital middle ear-related procedures were performed among Indigenous children aged 0–14. The middle ear-procedure rate was higher among Indigenous children (7.1 per 1,000 population) than non-Indigenous children (5.9 per 1,000 population).

Age: For Indigenous and non-Indigenous children, younger children aged 0–4 had higher rates than older children. The rate of procedures was slightly lower among Indigenous children aged 0–4 than non-Indigenous children in the same age group (10.2 and 11.2 per 1,000 population respectively). However, among children aged 5–9 and 10–14, the rate was higher among Indigenous children than non-Indigenous children (7.9 compared with 5.3 per 1,000 population and 3.1 compared with 1.3 respectively) (Figure 7.10a).

Sex: The rate was higher for Indigenous boys (8.1 per 1,000 population) than Indigenous girls (6.1 per 1,000 population).

Remoteness area: For Indigenous children, the rate was highest in *Very remote* areas (10.5 per 1,000 population) and lowest in *Outer regional* areas (5.8 per 1,000 population) (Figure 7.10b).

State/territory: The rate for Indigenous children was highest for usual residents of Western Australia (10 per 1,000 population). It was lowest in Tasmania (4.2 per 1,000 population) (Figure 7.10c).

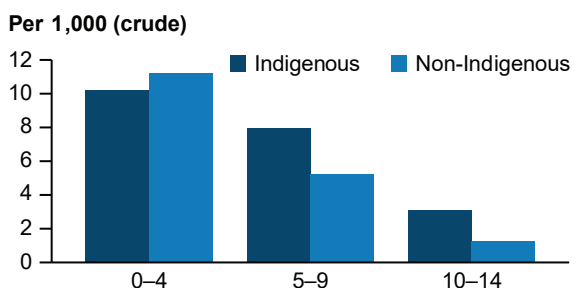
Time trend: Between 2010–11 and 2018–19, the rate of middle ear-related procedures for Indigenous children aged 0–14 increased from 5.7 per 1,000 population to 8.1 per 1,000 population. The rate then decreased in 2019–20 to 6.2 per 1,000 population.

This was driven by an increase in the middle ear-related procedure rate for Indigenous children aged 0–4 (Figure 7.11a). The rate for this age group increased from 6.0 per 1,000 population in 2010–11 to 12 per 1,000 population in 2018–19, before falling to 8.9 per 1,000 population in 2019–20. Despite increases during this period, middle ear-related procedure rates for Indigenous children aged 0–4 remained below that of non-Indigenous children aged in the same age group. For non-Indigenous children aged 0–4, the rate remained stable at approximately 12.5 per 1,000 population from 2010–11 to 2018–19, before dropping to 9.9 per 1,000 population in 2019–20.

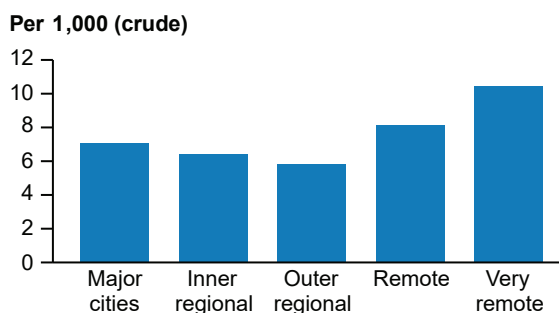
Among Indigenous children aged 5–9, the rate of middle ear-related procedures has oscillated between 7 and 10 per 1,000 population, reaching a high of 10 in 2017–18 (Figure 7.11b). Among Indigenous children aged 10–14, the rate remained relatively steady at around 4.0 per 1,000 population, before dropping to 2.6 per 1,000 population in 2019–20 (Figure 7.11c). In both age groups, across the period 2011–12 to 2019–20 the rate was higher among Indigenous children than non-Indigenous children of the same age.

Figure 7.10: Middle ear-related procedures among children aged 0–14, by selected characteristics, 2018–20

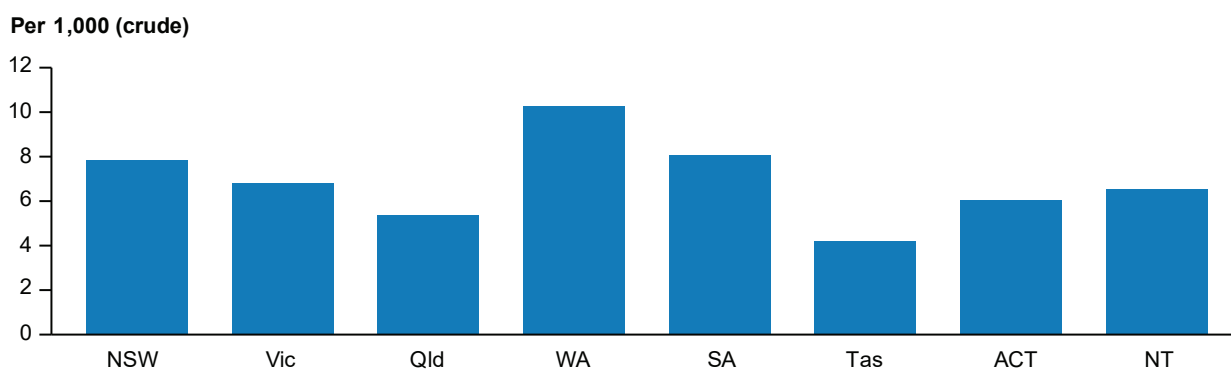
a) By Indigenous status and age



b) Indigenous, by remoteness area

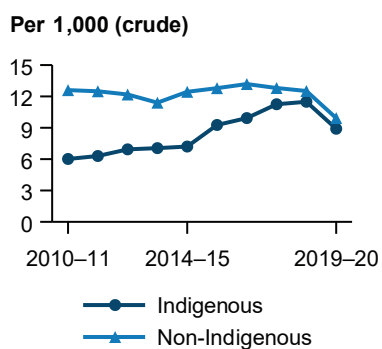


c) Indigenous, by state and territory

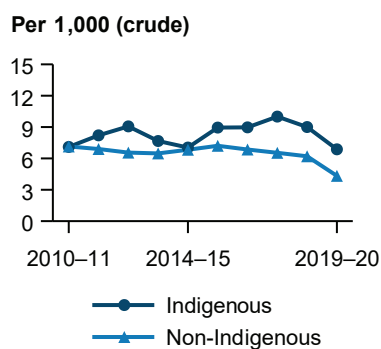


d) Time trend, by Indigenous status and age, 2010–11 to 2019–20

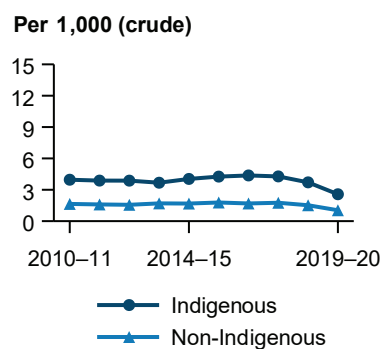
i) Children aged 0–4



ii) Children aged 5–9



iii) Children aged 10–14



Note: Data for these figures are available in the online supplementary tables.

Source: AIHW National Hospital Morbidity Database.

7.4.3 Adenoidectomy procedures

Adenoids are lymphatic glands located above the roof of the mouth, at the back of the nose. Frequently infected adenoids can contribute to recurrent ear infections as well as breathing problems, sinus infections and other complications. Adenoids are often removed at the same time as the tonsils but can be removed in a separate procedure. They are removed through the mouth. This section examines the number and rate of adenoidectomy procedures during hospitalisation among Indigenous children aged 0–14 from the National Hospital Morbidity Database.

Overall: In 2018–20, 5,200 hospital-based adenoidectomy procedures (with and without tonsillectomy) were performed for Indigenous children aged 0–14 (9.2 per 1,000 population). The rate of hospital-based adenoidectomy was slightly lower among Indigenous children than non-Indigenous children (9.2 compared with 10.6 per 1,000 population).

Sex: The rate was higher for Indigenous boys aged 0–14 than Indigenous girls (10 compared with 8.3 per 1,000 population).

Remoteness area: The rate was highest for Indigenous children aged 0–14 who were usual residents of *Major cities and Inner regional areas* (10 per 1,000 population and 11 per 1,000 population respectively). The rate was lowest among Indigenous children aged 0–14 who were usual residents of *Very remote areas* (4.3 per 1,000 population).

State/territory: The rate was lowest in the Northern Territory (3.9 per 1,000 population). It was highest in New South Wales (11 per 1,000 population).

Time trend: The rate of adenoidectomy among Indigenous children aged 0–14 has increased substantially over time, from 4.4 per 1,000 population in 2010–11 to 8.9 per 1,000 population in 2019–20.

7.5 Hearing aids and cochlear implants

The early fitting of hearing devices – hearing aids and cochlear implants – when appropriate, can reduce the impact of hearing loss and support speech and language development (Box 5.4). All children aged 0–14 with long-term hearing loss are eligible for hearing services provided by Hearing Australia under the Hearing Services Program (HSP).

This section provides data from Hearing Australia on the characteristics of Indigenous children aged 0–14 who have been fitted with a hearing aid or cochlear implant and were provided with audiological, hearing aid or cochlear implant speech processor support services through Hearing Australia. The data provide a ‘snapshot’ of Hearing Australia clients current and active on 31 December 2019, including:

- characteristics of Indigenous children aged 0–14 with hearing loss fitted with hearing devices as at 31 December 2019 (referred to as ‘aided Indigenous children’)
- the age of first fitting of hearing for Indigenous Australians aged 0–14 at the time of their first fitting, 2008 and 2019.

Information on aided Indigenous clients of all ages is in Section 5.2. This section provides more detailed information on aided Indigenous children aged 0–14.

7.5.1 Hearing Australia clients fitted with hearing devices

Overall: On 31 December 2019, Hearing Australia provided audiological, hearing aid or cochlear implant speech processor support services to 1,247 (4.4 per 1,000 population) aided Indigenous children aged 0–14. Indigenous children were 1.6 times as likely as non-Indigenous children to have aided hearing loss and receive support services from Hearing Australia (4.4 and 2.7 per 1,000 population respectively).

Age: Indigenous children aged 5–9 were more likely to be Hearing Australia clients with aided hearing loss than other age groups. The rate for Indigenous children aged 5–9 was 6.0 per 1,000 population (560 children), 5.2 per 1,000 population for Indigenous children aged 10–14 (477 children) and 2.2 per 1,000 population for Indigenous children aged 0–4 (210 children).

Rates for Indigenous children aged 5–9 and 10–14 were 2.0 and 1.6 times the rate among non-Indigenous children respectively (Figure 7.12a). They were similar for Indigenous and non-Indigenous clients aged 0–4 (2.2 and 2.0 per 1,000 population respectively).

Sex: The rate was similar among Indigenous boys (4.6 per 1,000 population) and Indigenous girls (4.2 per 1,000 population).

Remoteness area: The rate was highest among Indigenous children living in *Remote and very remote* areas (617, 14 per 1,000 population), followed by *Inner and outer regional* areas (366, 2.8 per 1,000 population) and *Major cities* (264, 2.5 per 1,000 population) (Figure 7.12b).

The opposite trend was the case for non-Indigenous children aged 0–14, with the highest rate in *Major cities* (9,486, 2.9 per 1,000 population), followed by *Inner and outer regional* areas (2,649, 2.4 per 1,000 population) and *Remote and very remote* areas (79, 1.3 per 1,000 population).

State/territory: The rate was highest for Indigenous children in the Northern Territory (294, 14 per 1,000 population), followed by Western Australia (231, 6.2 per 1,000 population) and Queensland (391, 4.8 per 1,000 population) (Figure 7.12c).

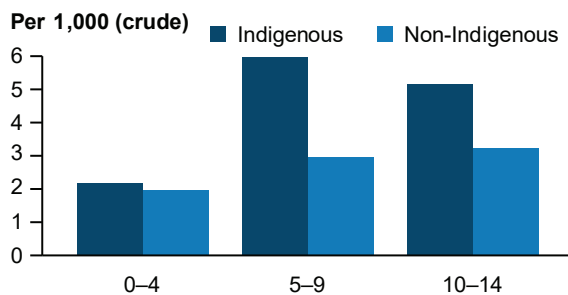
Type of device: Among Hearing Australia clients, 1,212 (97%) aided Indigenous children were fitted with a hearing aid and 53 (4%) with a cochlear implant.

Level of hearing impairment: At their latest assessment with Hearing Australia, 1,012 (81%) aided Indigenous children had no or mild hearing impairment (Box 5.7), 153 (12%) moderate hearing impairment, and 76 (6%) severe or profound hearing impairment. The proportion of aided Indigenous children with moderate or greater hearing impairment was highest among children aged under one year (Figure 7.12d).

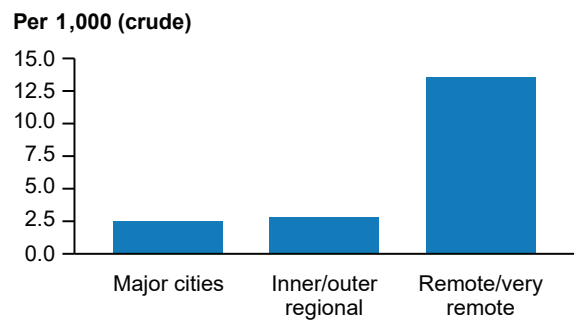
Device usage: Information on device usage was available for a subset of Indigenous Hearing Australia clients aged 0–14 (457 Indigenous children), predominately from remote communities. Among these children, 72% (331) reported using their device.

Figure 7.11: Hearing Australia clients aged 0–14 with a hearing aid or cochlear implant, by selected characteristics, as at 31 December 2019

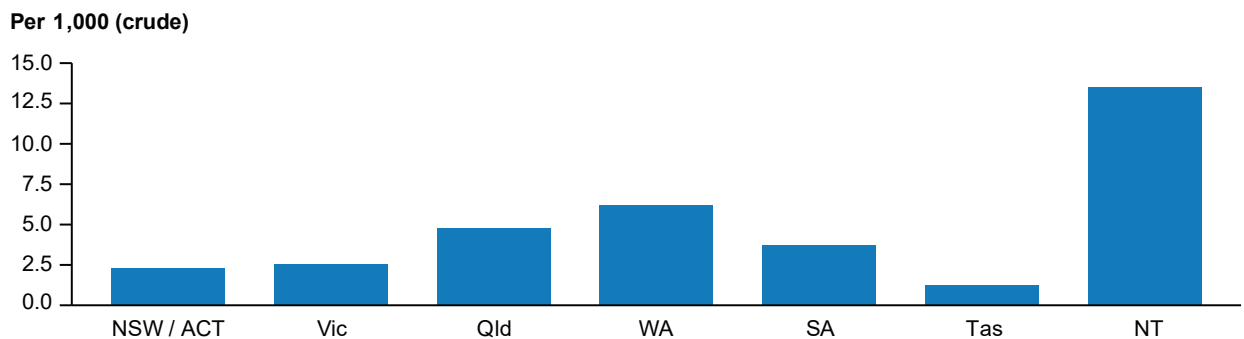
a) By age and Indigenous status



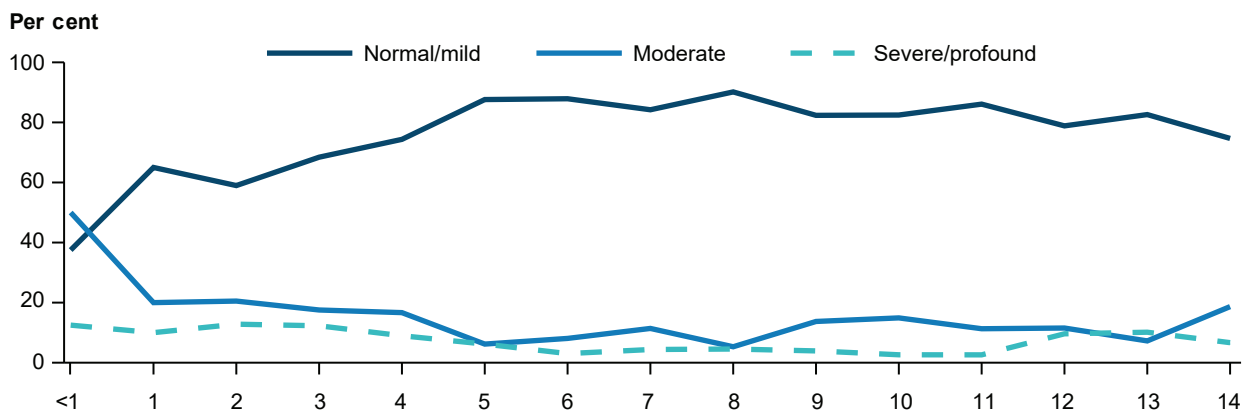
b) Indigenous clients, by remoteness area



c) Indigenous clients, by state/territory



d) Hearing impairment among Indigenous clients, by age and severity



Notes:

1. For figure (d) percentages are the proportion of the total number of Indigenous Australian Hearing Australia clients in the corresponding age group as at 31 December 2019. All other figures show population-based rates.
2. Hearing impairment level is at most recent assessment.
3. Data for these figures are available in the supplementary tables.

Chart: AIHW. Source: Hearing Australia 2020 data.

7.5.2 Age of first fitting

Overall: Between 2008 and 2019, 3,279 Indigenous children aged 0–14 were fitted with a hearing aid or cochlear implant and received audiological or hearing support services from Hearing Australia. The number of Indigenous clients aged 0–14 first fitted in a year dropped from 289 in 2008 to 171 in 2012, before increasing to 359 in 2016 and remaining relatively stable between 2016 and 2019 (Figure 7.13a).

Age at first fitting: In 2019, the age of first fitting among Indigenous clients aged 0–14 peaked at ages 4–6. A total of 115 (33%) Indigenous children fitted before age 15 were fitted between ages 4 and 6.

For non-Indigenous children, the peak age of first fitting was aged under one (573, 24%), with a smaller, secondary peak at age 4–6 (511, 16%) (Figure 7.13b).

Box 7.3 Optimal age of first fitting

Evidence shows that hearing loss during the first year of life affects brain development of children particularly the development of their cognitive skills, auditory processing skills, and speech and language skills. Hearing loss during early childhood can have ongoing life-long consequences.

The difference in age of first fitting between Indigenous and non-Indigenous children can be explained partially by the differences in the causes of hearing loss among the two groups. A large proportion of hearing loss experienced by non-Indigenous children is present and identified at birth, resulting in a peak age of first fitting of hearing devices in the first year of life. In contrast, a large proportion of hearing loss experienced by Indigenous children relates to early onset, chronic otitis media, which is not present at birth but often appears in the first year of life.

The optimal timing of intervention to improve hearing is within the first 12 months of life. For children diagnosed after 12 months of age with early onset, chronic otitis media and associated hearing loss, intervention should occur within 3 months of diagnosis.

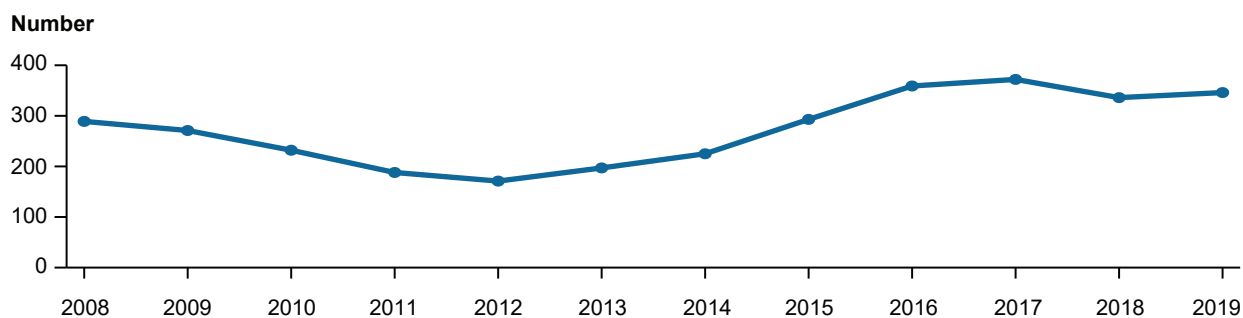
(Hearing Australia 2020, NAL 2020).

Time trend: Between 2008 and 2019, there was a trend toward an earlier age of first fitting among Indigenous and non-Indigenous children. Among Indigenous clients, the proportion first fitted when aged 0–5 years increased by from 21% in 2008 to 45% in 2019 (Figure 7.13c–d). Among non-Indigenous clients aged under 15, the proportion of clients first fitted when aged 0–5 increased between 2008 and 2019 from 35% to 55%.

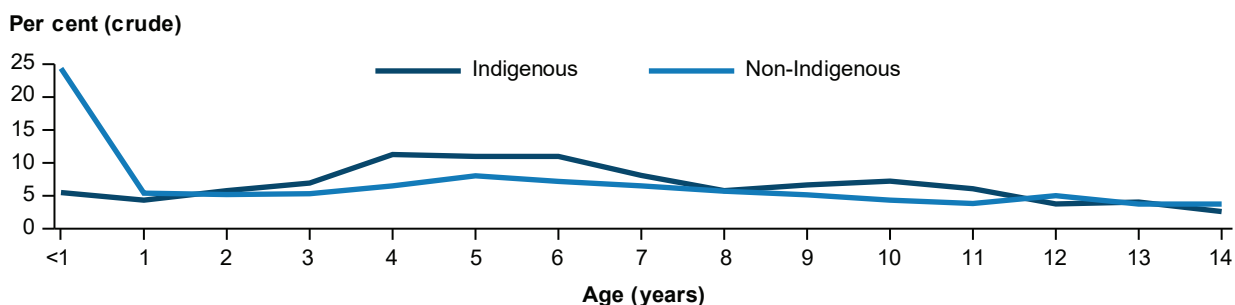
Type of hearing loss: For clients aged 0–14 first fitted with a hearing device between 2008 and 2019, roughly equal proportions of Indigenous clients were fitted for conductive (48%) and non-conductive (52%) hearing loss. Among non-Indigenous children, 21% of clients were fitted with a hearing device for conductive hearing loss and 79% for non-conductive hearing loss. Among Indigenous children, the proportion fitted due to conductive hearing loss peaked at ages 4–6. Approximately 57% of Indigenous children aged 4–6 were fitted with a hearing device for conductive hearing loss. Among non-Indigenous children, the peak of fitting for conductive hearing loss was lower and flatter, with approximately 25% of non-Indigenous children aged 5–8 fitted (Figure 7.13e).

Figure 7.12: First fittings of hearing aids and cochlear implants among Hearing Australia clients aged 0–14, by selected characteristics, 2008 to 2019

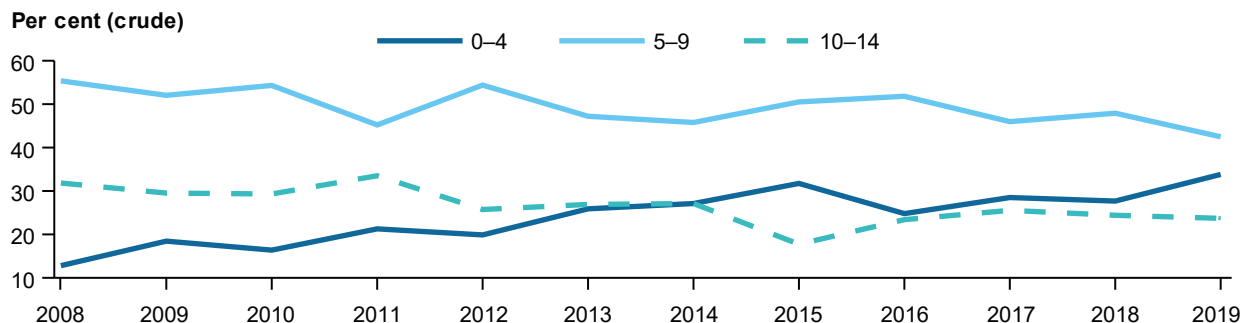
a) Indigenous Australians, time series, 2008 to 2019



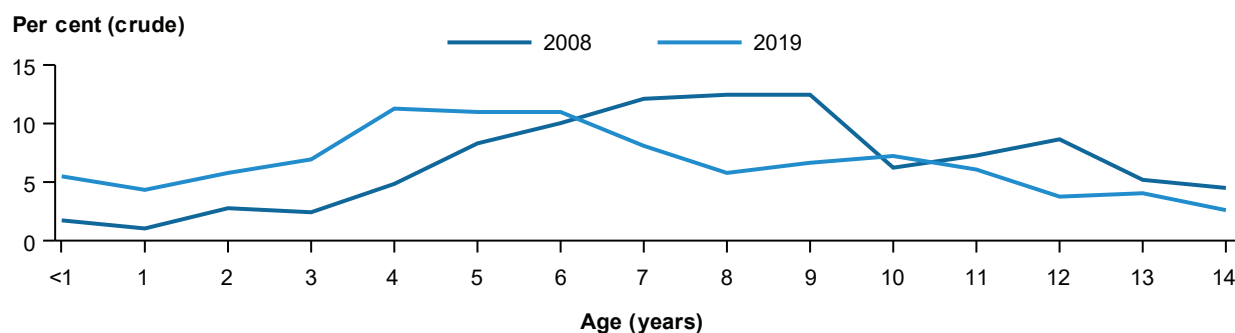
b) By age and Indigenous status, 2019



c) Indigenous Australians, time series by age, 2008 to 2019



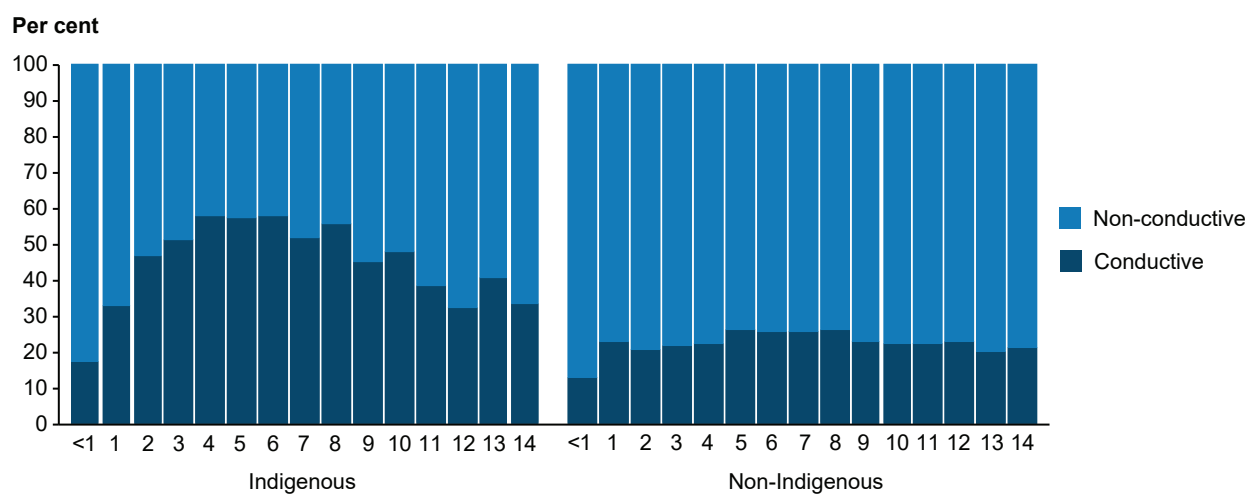
d) Indigenous Australians, by age, 2008 and 2019



(continued)

Figure 7.12 (continued): First fittings of hearing aids and cochlear implants among Hearing Australia clients aged 0–14, by selected characteristics, 2008 to 2019

e) Type of hearing loss among clients fitted between 2008 and 2019, by age and Indigenous status



Notes:

1. Figure (e) shows data from all years between 2008 and 2019, combined. All other figures show data from single calendar years, separately.
2. Data for these figures are available in the supplementary tables.

Source: AIHW analysis of Hearing Australia (2020) data.



8



Data gaps and development opportunities

8 Data gaps and development opportunities



What do we know?

Available data provide an overview of the ear and hearing health of Aboriginal and Torres Strait Islander people, including survey data collected for the first time based on measured hearing loss. Detailed data are available on hospitalisations due to ear or hearing issues, and treatment services provided by Hearing Australia.

Key data gaps, limitations and opportunities

Data gaps and associated opportunities exist for improving reporting, in particular on prevalence of ear disease and hearing loss, use of primary care services, standardised national newborn hearing, the ear and hearing health workforce, and outcomes for Indigenous Australians with ear or hearing problems. Opportunities for data development include:

- repeated measurement of ear and hearing health in national health surveys to address limited prevalence data
- regular reporting on key primary health care indicators including presentations and treatments for ear and hearing health
- a comprehensive standardised national neonatal hearing screening data collection, including pathways from screening, to diagnosis, to treatment
- expanded workforce data sources with more detailed information on the ear and hearing health workforce, particularly on audiologists
- improved Indigenous identification in administrative datasets
- improved identification of people with ear disease and hearing loss in administrative datasets including education and health datasets
- greater capacity to link administrative and other datasets to understand pathways and outcomes
- better information and support for incarcerated population.

In preparing this inaugural national report on the ear and hearing health of Indigenous Australians, a range of data sources were reviewed and assessed for reporting, including identifying data gaps and potential data development opportunities. Table 8.1 summarises the data sources included.

This chapter provides an overview of some key data gaps and opportunities relating to prevalence, primary health-care data, nationally consistent newborn hearing screening, the ear and hearing health workforce, and outcomes.

The data gaps and development opportunities discussed align with issues and priorities raised in:

- the Roadmap for Hearing Health (2019)
- national inquiries into the hearing health of Australians (House of Representatives Standing Committee on Health Aged Care and Sport 2017 and Senate Community Affairs References Committee 2010)
- AIHW consultation with ACCHO jurisdictional affiliates (Appendix C)
- National Aboriginal and Torres Strait Islander Hearing Health Advisory Panel (Chapter 7).

Table 8.1: Data sources presented in this report

| Data source | Type | Age | Reference period | Frequency of collection | Relevant data used in this report |
|-------------------------------------|--------|-------------------|---------------------------------|-------------------------|--|
| Prevalence | | | | | |
| ABDS – Indigenous Australian study | Study | All ages | 2003; 2011; 2018 | N/A | Years lived with disability from hearing loss, otitis media and other hearing and vestibular disorders |
| NATSIHS | Survey | All ages | 2001; 2004-05; 2012-13; 2018-19 | Every 6 years | Measured hearing loss at the time of the survey |
| | | 7 and over | 2018-19 | Every 6 years | Reported prevalence of long-term ear and hearing problems |
| Protective and risk factors | | | | | |
| NATSIHS; NATSISS; | Survey | All ages | 2001; 2004-05; 2012-13; 2018-19 | Every 6 years | Reported data on the prevalence of various risk factors for ear or hearing problems |
| AIR | Admin | 1, 2 and 5 | 2003 to 2020 | N/A | Children fully vaccinated; specific vaccinations at age 1, 2 and 5 |
| Screening and diagnosis | | | | | |
| UNHS | Admin | Newborns | 2019-20 | Annually | Screening for permanent congenital hearing impairment |
| MBS | Admin | All ages | 2010 to 2020 | Monthly | Audiology referrals and prevalence of congenital hearing loss* |
| | | | | Annually | Indigenous-specific health checks, include an ear/hearing check |
| | | | | Annually | MBS subsidised audiology services |
| HAPEE, Hearing Australia | Admin | 0-5 years | 2019 to 2020 | N/A | Pre-school children receiving diagnostic audiology assessments, children diagnosed with hearing loss through HAPEE program |
| NNAPEDCD | Admin | All ages | 2013-14 to 2019-20 | Annually | Emergency department presentations for ear or hearing problems |
| Treatment and rehabilitation | | | | | |
| NHMD | Admin | All ages | 2010-11 to 2019-20 | Annually | Hospitalisations for ear disease, ear-related injuries, procedures |
| NESWTDC | Admin | All ages | 2012-13 to 2019-20 | Annually | Waiting list time for elective myringotomy and myringoplasty |
| Hearing Australia | Admin | 0-25; 26-49*; 50+ | 2008 to 2020 | N/A | Provision of hearing devices to eligible Indigenous Australians |
| NDIS | Admin | All ages | 30 June 2020 | N/A | Level of hearing impairment for eligible Indigenous Australians |
| | | | | N/A | NDIS participants with hearing impairment |
| Workforce | | | | | |
| NHWDS | Survey | N/A | 2013 to 2019 | Annually | Demographic information on ENT specialists |
| Census | Survey | N/A | 2016 | Every 5 years | Demographic information on audiologists |
| OSR | Admin | N/A | 2017-18 | Annually | Access to ENTs and audiologists through Aboriginal Medical Services |

*Limited data available

Note: ABDS = Australian Burden of Disease Study; Aboriginal and Torres Strait Islander people, NATSIHS = National Aboriginal and Torres Strait Islander Health Survey; UNHS = Universal Neonatal Hearing Screening programs (states and territories); MBS = Medicare Benefits Schedule; HAPEE = Hearing Assessment Program – Early Ears; NNAPEDCD = National Non-admitted Patient Emergency Department Care Database; NHMD = National Hospital Morbidity Database; NESWTDC = National Elective Surgery Waiting Times Data Collection; NDIS = National Disability Insurance Scheme; NHWDS = National Health Workforce Dataset; Census = 2016 Census of Population and Housing; OSR = Online Services Report.

8.1 Prevalence of ear disease and hearing loss

The ABS NATSIHS is the main source of data on the prevalence of ear disease and hearing loss among Indigenous Australians. The large NATSIHS sample size, Indigenous-specific survey design and repeated measurements over time allow for detailed examination of reported long-term ear and hearing. Reported long-term ear or hearing problems were included across the 2001, 2004–05, 2012–13 and 2018–19 surveys.

In addition, measured hearing loss, based on a hearing test, was collected for the first time in the 2018–19 NATSIHS survey. While some issues were faced in collection – including a relatively low response rate (46%) and lack of information on children aged under 7 (due to difficulties in testing this age group) – this information is an important addition to prevalence reporting.

The continued inclusion of a hearing test in the NATSIHS and a focus on how to better capture information on children aged under 7 is important for examining changes in hearing loss among Indigenous Australians over time. Capturing this information for young children is critical as the key developmental period for language, vision, hearing and higher cognitive functioning occurs at this age.

One main data gap relating to prevalence is the need for national information on how many people have ear and hearing conditions, such as otitis media. Collecting information on recent experiences of ear disease and hearing loss, particularly for young children would greatly improve data on prevalence.

The development and use of screening tools, such as the Parent-evaluated Listening and Understanding Measure (PLUM) and the Hear and Talk Scale (HATS), may assist in developing a standard questionnaire module to collect information on hearing loss and ear disease among young children (Box 8.1).

Box 8.1: Hearing screening tools: PLUM and HATS

The PLUM (Parents evaluated listening and understanding measure) and HATS (Hear and talk scale) screening tools can be used by primary health workers and early educators to help detect hearing and communication difficulties in Indigenous children aged 0–5.

One tool uses a picture book format to engage parents and carers to talk about their children's listening and talking skills in real-life situations. The score for each checklist indicates if a child's skills are 'not yet on track', 'developing' or 'on track' for their age. If a child scores not yet on track, it is recommended they be referred to an audiologist or speech pathologist. If a child scores developing, it is recommended that they be re-screened in 3 months.

These tools were co-designed by the National Acoustics Laboratories, Hearing Australia, and Western Sydney University, together with Indigenous and non-Indigenous primary health and early childhood professionals. They have been validated with Indigenous children from remote, regional and urban communities.

The nationally available hearing assessment tools are free and supported by Hearing Australia and National Acoustic Laboratories.

Source: National Acoustic Laboratories 2021b.

In addition to NATSIHS, the inclusion of ear and hearing health-related questions in other national surveys would increase available information on the prevalence of ear and hearing problems. One example is expanding of the second national eye health survey to become the Australian Eye and Ear Health Survey and including ear related questions, ear checks and hearing tests to provide another potential source of data on the prevalence of ear disease and hearing problems in Indigenous adults aged 40 and over.

Information on ear and hearing health is notably lacking in current data sources for other population groups. Section 8.7 looks at information available on the prevalence of ear and hearing problems among Indigenous Australians in the criminal justice system.

8.2 Primary care

Improved primary health-care data are essential to understanding the role and use of primary health care in the diagnosing, treating and managing ear disease and hearing loss of Indigenous Australians. It is also important for:

- understanding funding needs for primary services
- understanding links between primary, tertiary (hospital) and other sectors such as disability services
- developing better public health initiatives
- improving clinical performance in treating ear disease
- informing evidence-based guidelines.

Data and information about how people use primary health care are limited. To bridge this gap, the AIHW is leading the development of a National Primary Health Care Data Asset (more information: <https://www.aihw.gov.au/reports-data/health-welfare-services/primary-health-care/primary-health-care-data-development>). AIHW is also investigating the suitability and quality of My Health Record data to inform potential use in research and public health purposes is also under development by AIHW.

Three data collections contain data on the use of primary care by Indigenous Australians: the Online Services Report (OSR), the national Key Performance Indicators (nKPI), and the Medicare Benefits Schedule (MBS).

The OSR and nKPI collections provide information on organisations funded by the Australian Government under its Indigenous Australians' Health Programme (IAHP). Information about Indigenous clients is collected using Indigenous-specific Primary Health Care Services. Most of these services are delivered by ACCHOs.

The OSR collects high-level contextual information annually, for 1 July to 30 June, on Indigenous-specific health-care organisations. Information is collected on number of clients, client contacts, episodes of care, and staffing levels of Indigenous-specific health-care organisations. Information on specific diagnoses or treatments is not collected.

The nKPI collects information twice a year, in June and December, from Indigenous-specific health-care organisations on process-of-care and health-outcome indicators for Indigenous Australians. However, the data collected from these organisations do not currently include any ear or hearing health related measures. An outcome of a review undertaken by the AIHW which includes consultation with services and other stakeholders recommended that a measure relating to ear health be considered as part of the nKPIs (AIHW 2020c). Based on this recommendation the Aboriginal and Torres Strait Islander Health Services Data Advisory Group has agreed to the development of a new nKPI on ear health. This would provide information on the number and proportion of Indigenous regular clients aged 0 to 14 years who received at least one ear health check in the previous 12 months.

Medicare Australia collects MBS claims data, regularly provided to the Department of Health. Since 2002, Indigenous Australians can voluntarily choose to identify as being of Aboriginal and/or Torres Strait Islander descent to Medicare Services Australia. Medicare seeks Indigenous status information in its enrolment forms, including the general enrolment application form and the Aboriginal and Torres Strait Islander Medicare enrolment form. This information is recorded on the Medicare database through the Voluntary Indigenous Identifier. As not all Indigenous Australians choose to identify themselves in this way, estimates are adjusted to reflect the size of the Indigenous Australian population (Department of Health 2020c).

MBS is an administrative dataset primarily designed to record information related to MBS claims. MBS data do not include services provided in the public health system or under other arrangements that do not attract an MBS claim (for example, some Aboriginal Medical Services and state and territory health services). Therefore, MBS data do not give a comprehensive picture of service delivery for Indigenous Australians, particularly in Remote areas.

Information on the reason for visits, treatments provided and referrals made are not routinely collected in the MBS. As such, the MBS does not include information that allows for the identification of ear or hearing-related primary health-care visits. While there are some audiology-specific MBS items, most identification and treatment of ear disease likely occurs outside these.

Challenges that need to be overcome for the collection of national primary health-care data, include:

- the need for high quality Indigenous identification
- issues in identifying services related to ear and hearing problems
- primary health care includes a various health-care professionals, services and government programs, each of which act in different environments and collect information differently and each have different reporting requirements and client information system which creates complexity for extracting, collating and standardising data
- data sharing arrangements are complex and include a vast number of entities
- no consistent national classification system is used to code conditions and services
- relevant information may be recorded in free-text fields, such as diagnosis and medical history, or the reason for presentation or prescriptions which makes reporting difficult.

However, through Medicare, Indigenous Australians can receive primary care through regular Indigenous-specific health checks (Section 4.2). MBS data available on these health checks do not detail information on specific conditions examined but do report on the number and proportion of Indigenous Australians accessing this service.

8.3 Neonatal hearing screening

States and territories collect data on their respective newborn hearing screening programs. However, the content and scope of data collected varies. While there is no national data set or national reporting of neonatal hearing screening programs, substantial efforts have been made to adopt more consistent and comparable indicators nationally.

In 2013, a National Framework for Neonatal Hearing Screening (Neonatal Hearing Screening Work Group (NHSWG) 2013) and national performance indicators for neonatal hearing screening (AIHW 2013) were developed in consultation with the states and territories. These initiatives were designed to harmonise states and territories efforts.

However, considerable differences in reporting remain, particularly on Indigenous status. Lack of nationally consistent data collection and monitoring makes it difficult to report across programs and patient pathways. Challenges associated with creating a national neonatal hearing screening data collection include:

- dispersed governance and differences in funding with multiple departments, agencies, services and authorities – local and national – involved in each state and territory
- data and systems not linked between programs
- differences in systems used to collect and collate information (spreadsheets and databases), with some more difficult than others to collate, analyse and report on
- inconsistencies in the quality of Indigenous identification
- inconsistencies in terminology, program design and program coverage.

Some states have developed systems for the detailed capture and reporting of information across the treatment pathway.

Developing a national register for neonatal hearing screening including information on screening, diagnosis, and treatment has been recommended in multiple parliamentary inquiries into hearing health (House of Representatives Standing Committee on Health Aged Care and Sport 2017; Senate Community Affairs References Committee 2010). This is a priority area within the Roadmap for Hearing Health (COAG Health Council 2019). To support this development, the National Framework for Neonatal Hearing Screening was reviewed in 2020.

A national data set would:

- enable consistent monitoring and evaluation of programs
- enable monitoring of program coverage for Indigenous Australians
- enable monitoring of engagement with early intervention services
- underpin the development of a nationally consistent quality and standards framework
- permit national and international benchmarking and collaboration
- enable research into risk factors and health conditions associated with permanent congenital hearing impairment
- enable research and reporting on patient pathways through screening, diagnosis and intervention, potentially linking with other data sources to understand outcomes of children with hearing loss.

8.4 Ear and hearing health workforce

Ear and hearing health workforce data give a broad indication of access to specialists and ear and hearing health services. However, current data provide an incomplete picture. For example, data do not capture many audiology and ENT services. The extent to which Indigenous patients are serviced by ear and hearing health professionals is not clear from audiology, ENT or allied health personnel data. Also, data on audiologists and allied health personnel come from Census data so is updated infrequently.

Better information on the ear and hearing health workforce is needed to:

- ensure a sustainable, highly trained and qualified ear and hearing health workforce that can meet demand for ear and hearing health services
- improve awareness of what specialist professions do, in the community and among primary health-care professionals
- provide information on training pathways for Indigenous Australians entering the ear and hearing health workforce
- understand the extent to which the ear and hearing health workforce provides services in or near Indigenous communities and in partnership with Indigenous communities.

To inform understanding of the ear and hearing health workforce data need to include more detailed information on the:

- number and demographics of audiometrists and registered audiologists
- the main services provided by these professions and other professions providing ear and hearing-related care
- workforce dynamics such as turnover, training and experience levels, career pathways and hours worked.

The 2021 Census will provide some up-to-date information on the audiologist workforce, including demographics, place of usual residence and place of work.

Possible data developments that would increase understanding of the ear and hearing health workforce include:

- adding audiologists to the National Registration and Accreditation Scheme (Box 8.2)
- including Audiometrist as a 6-digit ANZSCO code, rather than under 'Medical Technician nec'.

Box 8.2: Further information on workforce data

ANZSCO classification and workforce data

The Australian and New Zealand Standard Classification of Occupations (ANZSCO) is a joint venture between the ABS and Stats NZ. It is a commonly used standard for coding occupations in Australian administrative and survey data (ABS 2019a).

Audiometrist is not a unique category in the ANZSCO, meaning that data sources using ANZSCO classification cannot provide information on audiometrists. Information on Audiologists is a 6-digit code in ANZSCO. For confidentiality reasons, access to 6-digit codes is limited in many data sources.

The ABS will undertake targeted updates of priority areas during 2021–22, including selected occupations associated with health. If the audiometrist workforce is larger than 300 full-time employed, a case could be made to include this occupation at the 6-digit level.

National registration and health workforce data

For a number of health professions, including ENT specialists, there is a single National Registration and Accreditation Scheme regulated by the Australian Health Practitioner Regulation Agency (AHPRA). This provides national protection to the title of these professions. Anyone who calls themselves any of the 'protected titles' in the Health Practitioner National Law Act 2009, such as 'chiropractor', 'medical practitioner', 'midwife' or 'psychologist', must be registered with the corresponding National Board (Australian Health Practitioner Regulation Agency 2021). Demographic and employment information for AHPRA registered health professionals is available through the National Health Workforce Dataset. The data are collected through an annual registration process and an additional workforce survey voluntarily completed at the time of registration.

Audiology and audiometry professions are not currently registered under AHPRA. The 2017 'Still waiting to be heard' Parliamentary inquiry recommended the Australian Government pursue the registration of audiologists and audiometrists under AHPRA. However, the Australian Government did not support this recommendation as registration in the AHPRA framework would require these professions to be demonstrated to pose a significant risk to public safety (House of Representatives Standing Committee on Health Aged Care and Sport 2017).

8.5 Outcome measures

No national data sources provide insights into health or social outcomes among Indigenous Australians with ear disease and hearing loss. While studies examine outcomes of children with hearing impairments, there are limitations, for example:

- the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study (National Acoustic Laboratories 2019) provides detailed information on outcomes for children with hearing impairment. Too few Indigenous Australians are included to allow for disaggregation of outcomes by Indigenous status.
- Footprints in Time: the Longitudinal Study of Indigenous Children (LSIC) study provides information on outcomes for Indigenous children. Information on ear and hearing problems is generally reported, rather than measured.

There are 2 main approaches that could be used to examine outcomes of Indigenous Australians who have experienced ear or hearing problems:

- **Targeted longitudinal studies.** Longitudinal studies focusing on the ear and hearing health of Indigenous children could provide important information on the association between ear or hearing problems and health and social outcomes. The Australian Government provided funding to National Acoustic Laboratories to lay the groundwork for a longitudinal study of outcomes for Indigenous children with otitis media and hearing loss (First Nations Longitudinal Outcomes for Children with Hearing Impairment) (National Acoustic Laboratories 2021a).
- **Data linkage of health and outcome-related datasets.** Data linkage (also called data matching, data integration or record matching) combines information from multiple data sources while preserving privacy. This tells a much more powerful story than is possible from individual data sources in isolation. It can also improve understanding of a range of issues. However, capacity to examine outcomes using data linkage is limited by data gaps in information on Indigenous Australians with ear disease or hearing loss in administrative datasets. Data linkage would allow research on the relationship between ear and hearing health problems in childhood and outcomes such as contact with the criminal justice system later in life (Section 8.7).

8.6 Indigenous identification

Identifying the Indigenous status of people accessing services is key to improving the quality of data used throughout this report. Identification also helps guide policy formation, program development and service provision. For example, better Indigenous identification supports Indigenous Australians to access Indigenous-specific services and programs.

However, in many data collections, Indigenous Australians are not consistently or reliably identified. Contributing factors include data collection practices, systems design and individual choices concerning disclosure of Indigenous status. Incomplete and inconsistent reporting of Indigenous status usually results in the Indigenous population, and their use of services, being underestimated.

The starting point for more reliable reporting on Indigenous Australians is collecting reliable and consistent information on Indigenous identification across data sets at the point of service provision or when information is being collected. The AIHW has developed national guidelines on Indigenous identification data (AIHW 2010a) and other resources to promote best practice and assist service providers. More information: <https://www.aihw.gov.au/reports-data/population-groups/indigenous-australians/indigenous-identification>

8.7 Hearing loss among Indigenous Australians in the criminal justice system

Hearing loss has been identified as a major issue in the overrepresentation of Indigenous Australians in the criminal justice system (Senate Community Affairs References Committee 2010). Hearing loss may lead to a person appearing non-compliant or aggressive, exacerbating problems in interactions with police, judicial or correctional staff (Australian Medical Association 2017; Howard & Barney 2020).

No national data exist on the prevalence of hearing loss, or a past history of ear and hearing problems, among people in the criminal justice system, but several studies have found high rates of hearing loss among Indigenous adults in prison and children in youth detention. In the Alice Springs and Darwin correctional systems, one study found that 90% of Indigenous Australians in prison have hearing loss (Vanderpoll & Howard 2012).

The proportion of people in prison with hearing loss appears to be higher among Indigenous Australians than non-Indigenous Australians. A 2004 study found that the hearing of Indigenous Australians in prison in NSW is poorer than that of non-Indigenous Australians in prison (Murray et al. 2004). A 2009 study in Victoria found that Indigenous Australians in prison had double the rate of sensorineural hearing impairment compared with non-Indigenous Australians in prison (Quinn & Rance 2009).

The National Prisoner Health Data Collection is the main source of national data on the health of people in prison in Australia. It presents information about the health experiences throughout the prison cycle—entry, time spent in prison, discharge, and after release. It does not contain information on ear and hearing health of people in prison.

In addition, data linkage would allow research on the relationship between ear and hearing health problems in childhood and contact with the criminal justice system later in life (Section 8.5).

Appendix A: Data sources

Australian Burden of Disease Study (ABDS)

The Australian Burden of Disease Study (ABDS) 2018 uses burden of disease analysis to measure the impact of 219 separate diseases and injuries on the health of the Australian population. It provides a detailed picture of the burden of disease for the Australian population in 2018, including comparisons with 2015, 2011 and 2003. The study includes estimates of total, fatal and non-fatal burden for the total Australian population, as well as by state and territory, remoteness areas and socioeconomic groups. It also includes estimates of the contribution made by selected risk factors on the disease burden in Australia, and by socioeconomic groups for some risk factors.

Burden of disease analysis produces comparable and concise policy-relevant evidence on the impact of disease, injuries and risks on the population. A key strength of burden of disease is the ability to collate and use data from various sources to develop an internally consistent measure for all diseases. The ABDS 2018 methods build on the methodological approach of the 2015 study, along with methodological developments used in recent iterations of the Global Burden of Disease study (GBD 2017 and 2019). Key considerations for the ABDS 2018 were the need for:

- national estimates relevant to Australia, while maintaining comparability with global methods as much as possible
- Indigenous estimates comparable with national estimates
- sub-national estimates (state and territory, remoteness and socioeconomic group)
- comparability to 2015, 2011 and 2003 estimates to enable valid comparisons over time.

Additional factors needed to be considered when calculating burden of disease estimates for Aboriginal and Torres Strait Islander people. As a general principle in the ABDS, the methods used to produce Indigenous burden of disease estimates were consistent with those used to produce national estimates. For example, the same reference life table, disability weights and disease list were used. However, it was not always possible to adopt completely consistent methods due to differences in data availability, data quality and population size and characteristics.

Burden of disease estimates for Indigenous Australians are produced as part of a separate study.

- Key findings have been released <https://www.aihw.gov.au/reports/burden-of-disease/australian-bod-study-2018-key-findings-indigenous>.
- Detailed 2018 estimates are available from <https://www.aihw.gov.au/reports/burden-of-disease/illness-death-indigenous-2018-summary/summary>.
- More information: <https://www.aihw.gov.au/reports/burden-of-disease/abds-impact-and-causes-of-illness-and-death-in-aus> and <https://www.aihw.gov.au/reports/burden-of-disease/abds-methods-supplementary-material-2018>.

Australian Immunisation Register (AIR)

The Australian Immunisation Register (AIR) provides administrative data on vaccinations. This data is provided from the National Immunisation Program, school programs, and through private vaccination providers. The major functions of the AIR are to provide an accurate measure of immunisation, and to provide a tool for monitoring coverage and delivery.

Coverage estimates for Aboriginal and Torres Strait Islander children include only those who identify as Indigenous and are registered on the AIR. Indigenous identification is collected via a yes/no flag on immunisation encounter forms and through Medicare offices when any changes are made to personal details.

More information: <https://www.servicesaustralia.gov.au/organisations/about-us/statistical-information-and-data/medicare-statistics/australian-immunisation-register-statistics> and <https://www.health.gov.au/health-topics/immunisation/childhood-immunisation-coverage/immunisation-coverage-data-surveys-and-reports>.

Census of Population and Housing (Census)

The Census of Population and Housing (Census) is Australia's largest statistical collection undertaken by the Australian Bureau of Statistics (ABS) which is undertaken every five years. Census data tells us about the economic, social and cultural make-up of the country. In this report, data from the 2016 Census are reported. The 2016 Census was the first to be digital, with more than 95% of Australians participating. It counted 23.4 million people living in Australia.

The Census uses the standard Indigenous status question and it is asked for each household member. The Census form may be completed by one household member on behalf of others. The processing of information from Census forms is now mostly automated. Quality assurance procedures are used during Census processing to ensure processing errors are minimised. Sample checking is undertaken during coding operations, and corrections are made where necessary.

When completing their Census form, some people do not answer all the questions that apply to them. In these instances, a 'not stated' code is allocated during processing, with the exception of non-response to age, sex, marital status and place of usual residence. Other Census data issues relate to the accuracy of the Census count itself, e.g. whether people are counted more than once, or not at all. More information about the 2016 Census is available at: <https://www.abs.gov.au/ausstats/abs@.nsf/PrimaryMainFeatures/2900.0?OpenDocument>. More information: <https://www.abs.gov.au/websitedbs/D3310114.nsf/Home/independent%20Assurance%20Panel>.

Deadly Ears Program data collection

The Deadly Ears Program was established by the Queensland Government to address the high rates of chronic middle ear disease and conductive hearing loss among Aboriginal and Torres Strait Islander children in Queensland. The data used in this report are gathered by staff employed by the Deadly Ears Program. The child's middle ear status is diagnosed by an ENT specialist and the child's hearing status is diagnosed by an audiologist.

The Deadly Ears data collection contains information on ENT clinic, audiology assessment and ENT surgery services from 2007 to 2019. More information: Appendix C; <https://www.aihw.gov.au/reports/indigenous-australians/queenslands-deadly-ears-program/>.

Hearing Australia

Hearing Australia data presented in this report are on the characteristics of Indigenous Australians with hearing loss who have been fitted with a hearing device and who were provided services by Hearing Australia through the Hearing Services Program (HSP). These are:

- demographic and hearing loss characteristics of Hearing Australia clients fitted with a hearing device as at 31 December 2019
- the age at first fitting of hearing devices, by calendar year, for Hearing Australia clients aged under 26 at time of first fitting
- device usage for Hearing Australia clients aged under 26 as at 31 December 2019 in specific outreach services.

More information: Appendix C.

Medicare Benefits Schedule (MBS) data

The Medicare Benefits Schedule (MBS) data collection contains information on services that qualify for a benefit under the Health Insurance Act 1973 and for which a claim has been processed. The database comprises information about MBS claims (including benefits paid), patients and service providers.

The MBS is a listing of Medicare services subsidised by the Australian Government. It is part of the Medicare program, managed by the Australian Government Department of Health and administered by Services Australia. Through the Medicare program, all Australian residents and certain categories of visitors to Australia are entitled to benefits for medical and hospital services, based on fees determined for each service provided. These services are itemised, forming the schedule of fees. Statistics on each item are collected when benefits are claimed.

While the data have been used to measure the level of specific activities, changes in the use of an MBS item over time can reflect changes in billing and claiming practices or the introduction of new items, and not necessarily changes in health care provided.

Data presented by state and territory and by remoteness area are based on the address information recorded in the patient's Medicare record. Data presented by remoteness area were classified according to the Australian Standard Geographical Classification.

More information: <https://www.aihw.gov.au/about-our-data/our-data-collections/medicare-benefits-schedule-mbs>.

Indigenous identification in Medicare data

The identification of Indigenous Australians in Medicare data is not complete. Since 2002, individuals who choose to identify as being of Aboriginal and/or Torres Strait Islander descent have been able to have this information recorded on the Medicare database through the Voluntary Indigenous Identifier (VII). VII enrolment is through either a VII enrolment form or a tick-box on a Medicare Australia enrolment form. Both methods of enrolment indicate that identifying as Indigenous is optional.

As at March 2016, an estimated 65% of the Indigenous population had identified as being of Aboriginal and/or Torres Strait Islander origin through the VII process. VII coverage varies by age group and state and territory.

National Aboriginal and Torres Strait Islander Health Survey (NATSIHS)

The National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) 2018–19 is the largest health survey of Indigenous Australians, conducted by the Australian Bureau of Statistics (ABS) between July 2018 and April 2019. This survey collected information on a range of topics including long-term health conditions, disability, lifestyle factors, physical harm and use of health services. It collected information from Aboriginal and Torres Strait Islander people of all ages in non-remote and remote areas of Australia, including discrete Indigenous communities.

The ABS conducts a periodic detailed health survey of the Aboriginal and Torres Strait Islander population only. The survey sample was designed to be representative of Indigenous people. Previous surveys were conducted in 2012–13 and 2004–05.

Of the 8,707 households included in the final sample, 6,388 (73.4%) were fully or adequately responding households. The sample included 10,579 people from these households. The population benchmark that the survey results were weighted to meet was 814,013. This was the projected Indigenous population at 31 December 2018, excluding persons in non-private dwellings.

More information on the survey methodology and data quality statement are available on the ABS website at: <https://www.abs.gov.au/methodologies/national-aboriginal-and-torres-strait-islander-health-survey-methodology/2018-19#quality-declaration-summary>.

National Disability Insurance Scheme (NDIS) Public Data Collection

The NDIS Public Data Collection includes information on:

- population demographics
- plans, support types and plan budgets
- market supply
- goals and outcomes
- NDIA performance.

The NDIA is responsible for data collection and, in accordance with legislation, policies, guidelines and any specific conditions, for use applicable to that data. As custodians, the NDIA seeks to use NDIS data to advance participant disability support and afford them choice and control.

More information: <https://data.ndis.gov.au/> and <https://data.ndis.gov.au/public-data-sharing>.

National Elective Surgery Waiting Times Data Collection

The National Elective Surgery Waiting Times Data Collection contains record information for patients removed from waiting lists for elective surgery which are managed by public acute hospitals, whether as by an elective or emergency case. This data includes private patients treated in public hospitals, and may include public patients treated in private hospitals.

The National Elective Surgery Waiting Times Data Collection covers most public hospitals that undertake elective surgery. Hospitals that were not included may not undertake elective surgery, may not have had waiting lists, or may have had different waiting list characteristics from those of reporting hospitals. Some smaller remote hospitals may have different patterns of service delivery to those of other hospitals because specialists providing elective surgery services visit these hospitals only periodically.

Data is reported by usual residence of the patient, not by location of the hospital. The collection is compiled by the AIHW from data supplied by the state and territory health authorities.

The latest data quality statement for the National Elective Surgery Waiting Times Data Collection is available at <https://meteor.aihw.gov.au/content/index.phtml/itemId/681619>; see also <https://www.aihw.gov.au/getmedia/88c95009-595e-4329-8e98-82fecf9c9798/Elective-surgery-waiting-times-2019-20-Appendix-information.pdf.aspx>.

National Health Workforce Data Set (NHWDS)

The Australian Health Practitioner Regulation Agency (AHPRA), in conjunction with the national health professional registration boards, is responsible for the national registration process for 14 health professions. The data from the annual registration process, together with data from a workforce survey that is voluntarily completed at time of registration, forms the Department of Health's National Health Workforce Data Set (NHWDS). Data in the NHWDS includes demographic and employment information (for example, labour force status, location of main job, area of practice, work setting) for registered health professionals. In this report, the data on optometrists and ophthalmologists come from the NHWDS as reported by AIHW.

More information: <https://hwd.health.gov.au/resources/information/nhwds.html>.

National Hospital Morbidity Database (NHMD)

Data about hospitalisations were extracted from the AIHW National Hospital Morbidity Database (NHMD), which is a compilation of episode-level records from admitted patient care data collection systems in Australian hospitals in each state and territory. Information on the characteristics, diagnoses and care of admitted patients in public and private hospitals is provided annually to the AIHW by state and territory health departments. Data are based on financial years.

Data are a count of hospital separations (episodes of admitted patient care, which can be a total hospital stay, or a portion of a hospital stay that begins or ends in a change of type of care) and not of patients. Patients who separated from hospital more than once in the year will be counted more than once in the data set. The number and pattern of hospitalisations can be affected by differing admission practices among the jurisdictions and from year to year, and differing levels and patterns of service delivery.

NHMD data presented by state and territory and remoteness area in this report are based on the patient's place of usual residence. There is some under-identification of Indigenous Australians in the NHMD, but NHMD data for all states and territories are considered to have adequate Indigenous identification from 2010–11.

A data quality statement for the NHMD is available at <https://meteor.aihw.gov.au/content/index.phtml/itemId/638202>; see also <https://meteor.aihw.gov.au/content/index.phtml/itemId/724188>; and <https://www.aihw.gov.au/getmedia/7e2c831c-38f8-407a-9931-51004e26f79b/admitted-patient-care-2019-20-appendixes.pdf.aspx>.

National Neonatal Hearing Screening Programs (states and territories) (NNHS)

Each jurisdiction has their own reporting mechanisms and there is no standardised national data collection to support comparable reporting on neonatal screening programs nationally.

More information: Appendix C.

National Non-admitted Patient Emergency Department Care Database (NNAPEDCD)

The National Non-Admitted Patient Emergency Department Care Database (NNAPEDCD) is a compilation of episode-level data for emergency department presentations in public hospitals. Non-admitted patients are patients who do not go through a hospital's formal admission process. Most patients who receive care in emergency departments are non-admitted patients, and they may subsequently become admitted. NNAPEDCD information includes type of presentation, principal diagnosis, state/ territory and demographic information.

All state and territory health authorities collect a core set of nationally comparable information on emergency department presentations in public hospitals within their jurisdiction, and the AIHW compiles this data annually.

The quality of the data reported for Indigenous status in emergency departments has not been formally assessed. In addition, the scope of the NNAPEDCD may not include some emergency services provided in areas where the proportion of Indigenous people (compared with other Australians) is higher than average. Therefore, the information on Indigenous status presented in this report should be used with caution.

The latest data quality statement for the NNAPEDCD is available at <https://meteor.aihw.gov.au/content/index.phtml/itemId/659714>; see also <https://www.aihw.gov.au/getmedia/9fc1268a-0657-4e9e-a002-2646e0bad795/Emergency-department-care-2019-20-Appendix-information.pdf.aspx>.

Northern Territory Remote Aboriginal Investment (NTRAI) Hearing Health Program

The Northern Territory Remote Aboriginal Investment (NTRAI) Hearing Health Program is funded by the Commonwealth Department of Health to improve the hearing health of Indigenous children and young people aged under 21 in the Northern Territory. The program provides ENT teleotology services; outreach audiology services; clinical nurse specialist services; and awareness and education activities. The data used in this report are collected from the hearing health outreach services refer to almost 8,700 Indigenous children and young people aged under 21 who received services between July 2012 and December 2020.

More information: Appendix C; <https://www.aihw.gov.au/reports/indigenous-australians/hearing-health-outreach-services-nt/summary>.

Online Services Report (OSR) collection

The Online Services Report (OSR) collects organisation-level information from Aboriginal and Torres Strait Islander specific health care organisations funded by the Australian Government under its Indigenous Australians' Health Programme (IAHP), with data provided to the AIHW. It includes information about services offered at primary health-care and other organisations and activities undertaken.

Information on data quality for the OSR collection is available at <https://www.aihw.gov.au/reports/indigenous-australians/indigenous-primary-health-care-results-osr-nkpi/technical-appendix/technical-notes/interpreting-osr-data>.

Appendix B: Consultation with the Aboriginal Community Controlled Health Organisation sector

Having a detailed understanding of the experiences of providers of primary health-care services for Aboriginal and Torres Strait Islander people is critical for developing comprehensive view of ear and hearing health services, describing patient pathways, identifying potential sources of data and key data gaps.

With the assistance of the National Aboriginal Community Controlled Health Organisation (NACCHO), AIHW invited the Aboriginal Community Controlled Health Organisation (ACCHO) jurisdictional affiliates (Table B.1) and ear and hearing health professionals within the ACCHO sector to contribute their expertise to this report in several ways:

- Programs - providing feedback on a comprehensive list of ear and hearing health programs for Indigenous Australians, compiled by AIHW. Feedback was provided by one jurisdictional affiliate.
- Questionnaire – providing information on ear and hearing health activities and initiatives by the ACCHO sector and identification of potential sources of program data. The questionnaire was developed by AIHW in consultation with Department of Health and NACCHO. It was based on the Roadmap for Hearing Health (2019) recommendations. Questionnaire responses were provided by four jurisdictional affiliates.
- Case studies to provide greater insight into barriers, the patient experience, the experiences of primary health-care providers and the innovative ways they have overcome barriers. Case studies were provided by four jurisdictional affiliates.

The jurisdictional affiliates invited to participate in the process are listed in Table B.1.

Table B.1 Aboriginal Community Controlled Health Organisations, Jurisdictional affiliates

| State / Territory | Jurisdictional affiliate |
|------------------------------|---|
| New South Wales | Aboriginal Health & Medical Research Council of NSW |
| Victoria | Victorian Aboriginal Community Controlled Health Organisation |
| Queensland | Queensland Aboriginal and Islander Health Council |
| Western Australia | Aboriginal Health Council of Western Australia |
| South Australia | Aboriginal Health Council of South Australia Ltd |
| Tasmania | Tasmanian Aboriginal Centre |
| Northern Territory | Aboriginal Medical Services Alliance Northern Territory |
| Australian Capital Territory | Winnunga Nimmityjah Aboriginal Health and Community Services |

Appendix C: Programs

Table D1: Summary of ear and hearing health programs

| | Funder(s) | Eligibility | | | Program activities | | | | | | | | | |
|--|-----------------------|----------------|------------------|---------------------|------------------------|-----------|--------------|-------------------------------------|---------------------|----------------|-----------------------|--|--|--|
| | | Location | Age group | Indigenous-specific | Awareness | Screening | Primary care | Audiology or ENT | Surgical support | Rehabilitation | Workforce development | | | |
| Care for Kids' Ears | Australian Government | Australia wide | All | Y | Website and resources | | | | | | | | | |
| Hearing Assessment Program – Early Ears (HAPEE) | Australian Government | Australia wide | <6 | Y | Resources | | | Hearing tests and care | | | | | | Primary care training |
| Healthy ears, better hearing better listening (HEBHBL) | Australian Government | Australia wide | <21 | Y | | | | Outreach services | | | | | | |
| Ear surgical support | Australian Government | Australia wide | All | Y | | | | | Expedites surgeries | | | | | |
| Ear Health Coordinators program | Australian Government | Australia wide | N/A | Y | | | | | | | | | | Fund coordinator role in ACCHS |
| EarTrain | Australian Government | Australia wide | N/A | Y | | | | | | | | | | Health workforce training |
| Ear and Hearing assessment equipment | Australian Government | Australia wide | N/A | Y | | | | | | | | | | Provides equipment to AMS |
| Northern Territory Remote Aboriginal Investment Hearing Health Program (NTRAI) | Australian Government | NT | <21 | Y | Resources and training | | | Outreach audiology, ENT teleotology | | | | | | Primary & tertiary care staff training, community, school and other training |
| Hearing Services Program (HSP) | Australian Government | Australia wide | <26; 26–49*; 50+ | N | | | | | | | | | | Funds hearing devices |
| National Disability Insurance Scheme (NDIS) | Australian Government | Australia wide | <65 | N | | | | | | | | | | Funds hearing devices and other support |

(continued)

Table D1 (continued): Summary of ear and hearing health programs

| Funder(s) | | Eligibility | | Program activities | | | | | | | | |
|---|---|----------------|----------|--------------------|-------------------------|---|-------------------|-------------------|-------------------|---------------------------|--|--|
| Infant Hearing Screening | States/territories governments | Australia wide | Newborns | N | | Universal screening | | | | | | |
| Deadly ears | Queensland Government and Australian Government | Qld | <18 | Y | Resources and education | | Outreach services | Outreach services | Outreach services | SP & OT outreach services | Primary care support | |
| EarBus | Western Australia Government and Australian Government, grants and sponsorships | WA | | | | Neonatal screening, School and playground based ear screening | Outreach services | Outreach services | | | | |
| Hearing for Learning (Menzies) | Australian Government and Northern Territory Government, Balnaves | Remote NT | N/A | Y | | | | | | | Local health and education training | |
| Listen to Learn (Hearing Australia) | Australian Government | Australia wide | <8 | Y | | | | | | | Resource and professional development for early childhood educators and teachers | |
| Improving Access and Pathways to care for Otolaryngology disease (ASOHNS) | Australian Government | Australia wide | <14 | Y | | | | | | | Toolkit to improve training and knowledge health-care providers | |

(continued)

Table D1 (continued): Summary of ear and hearing health programs

| Funder(s) | | Eligibility | | Program activities | | | | | |
|--|-----------------------------|--|--------|--------------------|--|--|---------------------------|--|---|
| Listen and Learning in Aboriginal Children (Macquarie University) | Australian Government | Developed in NSW and rolled out Australia wide | <10 | Y | | | | | A program of listening, language and communication skills to support Aboriginal children with hearing loss to learn at school |
| Healthy Kids Check | Tasmanian Government | Tas | 4yrs | N | | | Pre-school screening | | |
| Kindergarten hearing screening program | South Australian Government | SA | 3-4yrs | N | | | Pre-school screening | | |
| Winnunga Nimmityjah Aboriginal Health Service school visit program | | ACT | | Y | | | Early childhood screening | | Teacher training |
| Hear to learn | Private | Qld | | N | | | School screening | | |
| Hear for School | | Australia wide | N/A | | | | | | Teacher training |

*If meet additional eligibility criteria

AMS: Aboriginal Medical Services, ENT: ear, nose and throat, SP: speech pathology, OT: occupational therapy, ACCHO: Aboriginal Community Controlled Health Organisations.

Deadly Ears

Deadly Ears was established by the Queensland Government to address high rates of chronic middle ear disease and conductive hearing loss among Aboriginal and Torres Strait Islander children in Queensland. Funded by the Queensland and Australian Governments, Deadly ears program's include building capacity for local health services to undertake with ear and hearing checks in line with clinical guidelines, delivering outreach integrated ear and hearing health specialist clinician in targeted communities, coordinating care with other visiting and referral services related to ear and hearing health. More information: <https://www.childrens.health.qld.gov.au/chq/our-services/community-health-services/deadly-ears/>.

Ear and hearing assessment equipment

All Commonwealth funded Aboriginal Medical Services (AMS)'s and health clinics with a predominance of Indigenous patients have access to the supply and maintenance of ear and hearing assessment equipment funded by the Australia government and provided at no charge. More information: <https://www.health.gov.au/health-topics/aboriginal-and-torres-strait-islander-health/primary-care/ear-health-and-hearing-support>.

Earbus

Earbus is a Western Australian initiative funded by a mixture of Australian and Western Australian government grants and private funding. Mobile ear health clinics visit locations across region and remote Western Australia up to 11 times a year, providing free ear screening, surveillance and treatment services. More information: <https://www.earbus.org.au/>.

Ear Health Coordinators

The Australian Government funds ACCHS state and territory peak organisations to engage an Ear Health Coordinator. While the role varies in each jurisdiction, coordinators support Aboriginal Medical Services to focus on ear health issues, including prevention, surveillance, treatment and management. Assistance is also provided to streamline referrals to other services, identify gaps in services and conduct needs assessments. More information: <https://www.health.gov.au/health-topics/aboriginal-and-torres-strait-islander-health/primary-care/ear-health-and-hearing-support>.

Ear Surgical Support

The Ear surgical support initiative is part of a larger Eye and Ear Surgical Support (EESS) Program. The program expedites access to surgical interventions for Aboriginal and Torres Strait Islander people who have been diagnosed with ear conditions and are waiting for surgery. EESS is managed by the Healthy Ears Fundholders for each jurisdiction. The program prioritises patients living in rural and remote locations, and services are delivered as close to the patient's home location as possible. In 2019–20, 250 ear-related surgeries were expedited through the EESS program. More information: <https://www.health.gov.au/health-topics/aboriginal-and-torres-strait-islander-health/primary-care/ear-health-and-hearing-support>.

EarTrain

Funded by the Australian Government and delivered by TAFE NSW, EarTrain is an online training program, with optional practical skills workshops, for primary health-care professionals, including Aboriginal health workers, GPs and nurses. On completion of training, health professionals will have a skills base to more readily recognise clinical symptoms and behaviours that indicate ear health issues and initiate early intervention or ongoing surveillance. They will also be able to conduct comprehensive audiometry screening and assessment. The training is freely available for all primary health-care professionals providing care to Aboriginal and Torres Strait Islander people. Participants can optionally enrol and complete additional assessments towards a nationally accredited unit in conducting play audiometry. More information: <https://www.health.gov.au/news/help-people-hear-better>.

Prior to 2021, the Australian Government funded ear and hearing assessment training programs by Benchmark (2015–2020) and, before that, by NACCHO.

Healthy Ears – Better Hearing, Better Listening (HEBHBL)

HEBHBL aims to improve access to ear and hearing health services for Aboriginal and Torres Strait Islander children aged 0–21. The program supports multidisciplinary outreach services provided by a range of health professionals, including medical specialists, GPs, nurses, audiologists and speech pathologists. Services are implemented in each state by a fundholder organisation. HEBHBL does not directly pay for health professionals' services, it coordinates their participation in service delivery and pays for: travel and accommodation, backfilling of salaried medical staff, and/or an absence from practice allowance. More information: <https://aodknowledgecentre.ecu.edu.au/key-resources/programs-and-projects/3125/?title=Healthy%20Ears%20-%20Better%20Hearing%2C%20Better%20Listening>.

There is no funding requirement for HEBHBL funded programs to collect or publish data. The nature of HEBHBL funded programs vary greatly across jurisdictions. As such, there is no consistent approach to the data that is collected

Healthy Kids Check

Every child in Tasmania is eligible for a comprehensive health check at 4 years. The Healthy Kids Check includes a hearing test. More information: <https://www.health.tas.gov.au/health-topics/childrens-health/child-health-and-parenting-service-chaps>.

Hear for School

Delivered by Hearing Australia, Hear for School is a professional development program that aims to help school staff support their students' hearing and communication needs. Sessions are delivered at schools by audiologists. More information: <https://www.hearing.com.au/Hearing-loss/Children-young-adults/Hear-for-School-development-program-for-teachers>.

Hearing Assessment Program – Early Ears (HAPEE)

To address the high levels of ear disease and associated hearing loss among Aboriginal and Torres Strait Islander children, the Australian Government provides funding for the Hearing Assessment Program – Early Ears (HAPEE), led by Hearing Australia.

Commencing in July 2019, HAPEE provides free hearing checks to Indigenous children aged 0–6 years who do not yet attend full-time school. HAPEE also provides support and training to health services that the program visits, and on-going advice and support to parents and carers.

HAPEE commenced in June 2019 to support ear detection and treatment of hearing loss for Aboriginal and Torres Strait Islander children. HAPEE aims to:

- Provide diagnostic hearing assessment and follow-up treatment
- Contribute to strengthened management of ear health in primary care
- Increase community awareness about the importance of ear and hearing health.

HAPEE is available to Aboriginal and Torres Strait Islander children in the years before primary school (approx. 0–6 years, depending on when children start primary school in different jurisdictions). HAPEE initially focused on rural and remote communities, but is expanding to regional and urban locations

Children can obtain an ear health check and diagnostic assessment through HAPEE by:

- referral following a primary health-care ear check. HAPEE partners with primary health-care providers and supports local services to conduct initial ear checks
- going directly to Hearing Australia.

Hearing Australia audiologists will provide diagnostic hearing assessments to eligible children who have been identified to be at risk of hearing loss. Where required, Hearing Australia audiologists can also undertake an initial ear assessment. Hearing Australia will report back to the primary health clinic if any further referral action is recommended. Hearing Australia audiologists also provide primary care staff with upskilling during outreach visits. More information: <https://www.hearing.com.au/HAPEE/About-HAPEE>.

Hearing for Learning

Funded by the NT and Australian Governments and the Balnaves Foundation, Hearing for Learning aims to integrate locally-based ear health project officers into existing local health services to establish culturally appropriate, reliable and sustainable ear and hearing health services. More information: https://www.menzies.edu.au/page/Research/Centres_initiatives_and_projects/Hearing_for_Learning_Initiative/.

Hearing Services Program

The Hearing Services Program (HSP) works towards reducing the incidence and consequences of avoidable hearing loss in the Australian community by providing access to hearing services and devices. Under the HSP, an eligible person can receive a hearing assessment and fully or partially subsidised hearing services, including hearing rehabilitation, hearing aid devices, annual hearing check-ups and advice on hearing loss prevention.

HSP services are delivered through two streams, the Voucher program and the community services obligation (CSO).

Voucher stream services are delivered by approximately 300 contracted private providers and Hearing Australia. Clients are issued with a voucher for hearing services and devices that they can use at a service provider of their choice.

The main avenue for accessing the Voucher stream is visiting a hearing health clinician who is an approved provider. The clinician then checks the client's eligibility and lodges an application for a Voucher on the client's behalf. People can also lodge an application for a Voucher online or be referred by other services, such as the NDIS. There is no requirement for an individual to have any identified hearing issues to obtain a voucher.

Voucher holders receive a full hearing assessment. If the client's hearing loss is assessed as being above the minimum hearing loss threshold of 24 decibels, they are then eligible for one subsidised hearing aid per ear. The voucher also covers maintenance and repair services for hearing aids, a replacement hearing aid if they are lost or damaged beyond repair, and an annual review examining the client's hearing loss and suitability of their hearing aid. If the client's hearing impairment is assessed as being below the minimum hearing loss threshold, they are not eligible for subsidised hearing aids, but can receive up to two subsidised rehabilitation sessions.

The eligibility criteria for the voucher program are:

- Australian citizen or permanent resident aged 21 years or older and
 - A Pensioner Concession Card holder
 - A Department of Veterans' Affairs Gold Card holder
 - A Department of Veterans' Affairs White Card holder (hearing-specific conditions)
 - A dependent of a person in one of the above categories
 - A member of the Australian Defence Force
 - Referred by the Disability Employment Services Program

CSO clients are eligible for higher levels of fully-subsidised technology than Voucher program clients. Hearing Australia is the sole provider of services to eligible Australians under the CSO program.

The main pathways to accessing CSO stream services are babies referred following diagnosis of hearing loss through the universal neonatal hearing screening or other neonatal services, children referred by medical, early intervention or education services, Indigenous Australians referred by their health-care provider, referral through the Voucher program. Accessing the CSO stream requires participants to have received a diagnosis of hearing loss prior to being eligible for the program.

The eligibility criteria from the CSO are:

- Australian citizen or permanent resident and
 - A person from one of the voucher program eligibility groups who has complex hearing or communications needs or lives in a remote area
 - an Aboriginal or Torres Strait Islander person who
 - Is aged 50 years or older or
 - Is a participant in the Community Development program
 - Was a participant in the Community Development Employment Programs program on or after 30 June 2013, has since ceased participating in the program and was receiving hearing services from Hearing Australia prior to ceasing participation
 - A person aged under 26 who is an Australian citizen, permanent resident or young NDIS participant

Some people may be eligible for both the Voucher and CSO streams. In this case, the client may choose the stream through which they receive services. More information: <https://hearingservices.gov.au/>.

Hear Our Heart Ear Bus Project

Based in Dubbo, NSW, the not-for-profit Hear Our Heart Ear Bus Project provides free ear health education, targeted hearing testing and free access to ear specialists to children in Dubbo and Districts. More information: <https://www.hearourheart.org/>.

National Disability Insurance Scheme

The National Disability Insurance Scheme (NDIS) funds hearing services, including hearing aids, for people that are not eligible for the HSP. In addition, people who are eligible for both HSP and NDIS can use NDIS to fund services and supports not available through HSP. For example, a NDIS plan could include funding towards maintenance and replacement of hearing aids, additional assistive listening devices, or interpreting services. More information: <https://www.ndis.gov.au/understanding/ndis-and-other-government-services/hearing-supports>.

Northern Territory Remote Aboriginal Investment (NTRAI)

NTRAI provides funding to improve the health and wellbeing of children and young people aged under 21 in Northern Territory communities. NTRAI's ear and hearing health services includes providing health education, awareness and education activities; training primary care, health and hospital staff and communities, schools and other service providers; ENT teleotology services; in-person outreach audiology services; and clinical nurse specialist services for children in remote communities. More information: <https://www.aihw.gov.au/reports/indigenous-australians/hearing-health-outreach-services-nt/summary>.

Telethon Speech & Hearing

Telethon Speech & Hearing (TSH) is a Western Australian based not-for-profit organisation, registered charity and independent school offering quality diagnostic, therapy and support services for children with hearing loss and speech and language delays. More information: <https://www.tsh.org.au/>.

Universal Neonatal Screening Program

Universal Neonatal Hearing Screening (UNHS) is used to detect permanent congenital hearing loss in infants, which occurs in one to two infants per 1,000 births. The screening procedures are non-invasive, automated screening tests that are performed at the bedside in term and pre-term infants soon after they are born (Patel and Feldman 2011). All states and territory governments have Universal Neonatal Hearing Screening programs (also known as Universal Newborn Hearing Screening programs) under which the aim is to screen all eligible infants.

New South Wales Statewide Infant Screening - Hearing (SWIS-H) program

The NSW Statewide Infant Screening - Hearing (SWISH) Program is aimed at identifying all babies born in NSW with significant permanent hearing loss by 3 months of age, and for those children to be able to access appropriate intervention with services outside of NSW Health by 6 months of age. Identification is achieved through offering universal hearing screening to all newborns.

All referred newborns receive an audiological assessment (2 stage Automated Auditory Brainstem Response). If a hearing loss is detected medical assessment and family support is available. A child who is diagnosed with hearing loss in the program could be referred to Hearing Australia, SWISH Hearing Support Services and other medical specialists.

The SWISH Travel Assistance Scheme was established to reimburse parents for the cost of travel where they live more than 100km (one way) from one of the three tertiary diagnostic assessment centres.

If diagnosed as having hearing impairment, newborns are referred to Hearing Australia, where they are provided with the different options available for intervention services appropriate to the degree of hearing loss and specific diagnosis.

Support throughout the diagnostic audiology process and during referral is provided by the diagnosing Audiologist and SWISH Parent Support (Social Worker) in assisting parents to make the decisions. The Parent Support (Social Worker) provides information to parents about early intervention, eg. hearing aids, cochlear implant and educational programs to assist in their decision making during this time. More information: <https://www.health.nsw.gov.au/kidsfamilies/MCFhealth/child/Pages/hearing-services.aspx>.

Victorian Infant Hearing Screening Program

VIHSP is a population-based hearing screening program that provides newborn hearing screening services to all newborns in Victoria. This statewide program aims to identify babies born with congenital permanent bilateral hearing loss of moderate or greater degree.

VIHSP uses automated Auditory Brainstem Response (ABR) screening technology to determine if a baby needs to attend audiology for further assessment. VIHSP hearing screening involves a two-stage process. Babies who do not pass their initial screen (Screen 1) are given a repeat screen (Screen 2). Babies who do not pass on two screens are at higher risk of having a significant hearing loss, and therefore require referral for diagnostic testing by an audiologist. Families of babies referred to audiology are offered support through the VIHSP Early Support Service (ESS). Where there is a hearing loss diagnosis, ESS provides support until the baby is enrolled in early intervention.

The program is funded by the Victorian Government Department of Health (DH) and is administered by the Royal Children's Hospital Melbourne. VIHSP works collaboratively with Victorian maternity hospitals, diagnostic audiology providers, Maternal and Child Health, Hearing Australia, and Early Childhood Intervention Services. More information: <http://infanthearing.vihsp.org.au/home>.

Queensland – Healthy Hearing Program

The Queensland Healthy Hearing Program offers free newborn hearing screening to all babies born in Queensland hospitals, including both public and private facilities.

To access a free hearing screen babies must be eligible / or enrolled for an Australian Medicare card. Non Medicare eligible families must have finalised payment in full for Delivery and Postnatal care for the Baby to access the hearing screen.

The screening service is part of Queensland Health's newborn care services to ensure every child reaches optimum speech and language development.

If a child 'refers' on the newborn hearing screening, free, follow-up care will be available at one of 13 paediatric audiology clinics across Queensland.

Additional services are available for children diagnosed with a hearing loss, including a medical investigation to identify the cause of the hearing loss, support services and early intervention.

The Children's Health Queensland Healthy Hearing team supports the pathway, from screening to diagnosis, and early intervention. Children's Health Queensland Healthy Hearing sets the overall direction, monitoring, reporting, education and service development in relation to infant hearing loss detection. More information: <https://www.childrens.health.qld.gov.au/service-healthy-hearing-program/>.

South Australia – Universal Newborn Hearing Screening (UNHS) program

The Universal Newborn Hearing Screening (UNHS) program, governed by the Women's and Children's Health Network, was rolled out in South Australia in 2006 to 31 public and private birthing hospitals. The screening program consists of up to two stages; the first hearing screen is completed before discharge from hospital by hospital midwives, except for the Women's and Children's Hospital, where Designated Hearing Screeners perform hearing screens. For babies who don't pass the first screen, a second screen is completed by Nurses or Midwives at Child and Family Health Service (CaFHS).

The Women's and Children's Health Network provides statewide diagnostic audiology services enabling the South Australian Program to track children from screening through to diagnosis. More information: <https://www.cafhs.sa.gov.au/services/newborn-hearing-assessment>.

Western Australia – Newborn Hearing Screening Program

The Newborn Hearing Screening Program in Western Australia involves screening newborn babies to identify those with moderate to profound (> 40 decibels) congenital permanent bilateral, unilateral sensory or permanent conductive hearing loss including neural hearing loss.

The Newborn Hearing Screening Program is provided by the WA health system as part of standard maternity care.

The Child and Adolescent Health Service is responsible for providing administrative, management and quality assurance services for the WA Newborn Hearing Screening Program through the Newborn Hearing Screening Department at Perth Children's Hospital. It is responsible for relevant operational policies and procedures to support a safe and quality Newborn Hearing Screening Program in line with the Mandatory Policy.

Currently the screening of babies born in private hospitals is performed by a private entity, contracted by the Child and Adolescent Health Service.

Health Service Providers that provide newborn hearing screening tests must offer newborn hearing screening and provide information to the parent/guardian of all eligible newborns and conduct the screening in line with the WA Newborn Hearing Screening Guidelines.

While Health Service Providers may choose to procure any hearing screening equipment on the market at their discretion (provided it meets equipment specification requirements), all HSPs in WA are currently using the Scanmedics Algo 3i hearing screening device. This device uses Automated Auditory Brainstem Response (AABR) to detect the auditory brainstem response (ABR) waveform with statistical confidence > 99%. It can screen babies from 34 weeks completed gestation to six months of age and provides a PASS/REFER result for 35dB nHL for both ears. More information:

<https://www.cafhs.sa.gov.au/services/newborn-hearing-assessment>.

Tasmania – Universal Newborn Hearing Screening (UNHS) Program

All newborn babies in Tasmania are offered a free hearing screen. A two-step screening protocol is used – babies that do not PASS their initial screen are re-screened. If a clear response is not obtained on the second screen a diagnostic appointment is arranged. The screening technology used is Automated ABR (AABR).

Every attempt is made to screen babies before they leave hospital. However, this is not always possible. If a baby is missed while in hospital, or requires follow up, an outpatient appointment is arranged. More information: <https://www.health.tas.gov.au/health-topics/hearing-audiology/about-hearing/newborn-hearing-tests>.

Northern Territory – Alice Springs Hospital – Newborn Hearing Screening Program

The Newborn Hearing Screening (NHS) program is currently running on a part-time basis on Mondays, Wednesdays and Fridays. On these days we endeavour to attend to all eligible babies on the ward to conduct the NHS prior to discharge. Those babies who are discharged prior to the NHS or require a second NHS are seen in the outpatient clinic (located at ASH) which is conducted on Monday mornings and Wednesdays. There is also an on-call option on weekends or after hours if necessary, i.e. a mother is being discharged and going directly back to community.

The program works in collaboration with the Alukura midwives as they predominantly take over the care of most of the indigenous mothers and babies after discharge. They are often able to facilitate transport for the mothers and babies into the clinic if needed.

For any babies that are missed for the NHS prior to leaving Alice Springs or are unable to be contacted, Community Health Centres are often able to organise and facilitate transport and accommodation for mothers and babies to attend an NHS appointment. If unable to conduct a NHS for a baby, they are placed on the Targeted Surveillance list and are seen by the audiologist for a diagnosis hearing test between 9-12 months of age. More information: <https://nt.gov.au/wellbeing/hospitals-health-services/hearing-services>.

ACT Newborn Hearing Screening Program

The ACT Newborn Hearing Screening Program identifies babies that are born with significant hearing loss and introduces them to appropriate services as soon as possible.

Trained screeners conduct the screening as soon as possible after a baby's birth. They place sensors on the baby's head to record their response to different sounds. The screen usually takes 10 to 20 minutes to complete. Sometimes a repeat screening is required, which is carried out later. More information: <https://www.health.act.gov.au/services-and-programs/women-youth-and-children/children-and-youth/childrens-hearing-service-chs>.

Winnunga Nimmityjah Aboriginal Health Service school visit program

Winnunga Aboriginal Health Service in the Australian Capital Territory visits all Koori preschools in Canberra twice a year, as well as preschools and primary school with high numbers of Indigenous students. A team of an audiologist and hearing health worker providing hearing screening and referrals for children with possible hearing problems. More information: <https://winnunga.org.au/>.

Tools and resources

Care for Kid's Ears

Provides a range of resources to increase awareness among Aboriginal and Torres Strait Islander Australians of risk factors for ear disease and the importance of seeking and following treatment regimes to prevent ear disease and hearing loss. Resources include activities to highlight the importance of hygiene and early intervention and the impact of smoking and nutrition on the ear health of children. More information: <http://www.careforkidsears.health.gov.au/internet/cfke/publishing.nsf>.

Clinical Care of Otitis Media Guidelines

Created by the Menzies School of Health Research, the Otitis Media Guidelines provides information to assist primary health-care providers deliver comprehensive, effective and appropriate care for Aboriginal and Torres Strait Islander people with otitis media. In the form of a multimedia tool, the Guidelines provides prevention advice, diagnostic algorithms, management suggestions, as well as educational resources for the health-care provider, families and children. More information: <http://otitismediaguidelines.com/>.

National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people

Created by NACCHO and The Royal Australian College of General Practitioners (RACGP), the National guide to a preventive health assessment provides advice for primary health services on providing screening and other preventive health interventions for Aboriginal and Torres Strait Islander people, including hearing loss prevention and screening. More information: <https://www.racgp.org.au/clinical-resources/clinical-guidelines/key-racgp-guidelines/view-all-racgp-guidelines/national-guide>.

PLUM & HATS

The PLUM (Parents evaluated listening and understanding measure) and HATS (Hear and talk scale) hearing assessment tools can be used by primary health workers and early educators to help detect hearing and communication difficulties in Aboriginal and Torres Strait Islander children aged 0 to 5 years. The toolkit includes:

PLUM and HATS screening tools and score forms a picture support book to assist in administering the tools.

Additional resources include:

- a user guide for the tools
- a language activities booklet to provide to families on how to encourage and support listening and communication
- a set of training videos that
 - explain what the tools are
 - demonstrate how the tools are used with families
 - demonstrate how the tools are scored and what the proposed recommendations are.

The tools were co-designed by the National Acoustics Laboratories (NAL), Hearing Australia, and Western Sydney University, together with Aboriginal and Torres Strait Islander and non-Indigenous primary health and early childhood professionals. They have been validated with Aboriginal and Torres Strait Islander children from remote, regional and urban communities.

The nationally available hearing assessment tools are free and supported by Hearing Australia and National Acoustic Laboratories. More information: <https://plumandhats.nal.gov.au/>.

Sound Scouts

Sound scouts is a hearing test app that provides parents, schools & healthcare professionals with direct access to a clinically validated hearing check in the form of an interactive hearing game. Funded by the Department of Health, Sound Scouts is available for free for all Australian schoolchildren aged 4–17. More information: <https://www.soundscouts.com/au/>.

Other activities funded by the Australian Government Department of Health supporting ear health

In addition to programs that specifically target ear and hearing health, the Australian Government funds a range of programs that indirectly support Aboriginal and Torres Strait Islander ear and hearing health.

These include:

- 140 Aboriginal Community Controlled Health Services (ACCHS) provide Aboriginal and Torres Strait Islander people access to effective, high quality culturally appropriate primary health care across Australia. Primary health-care services include management of ear health.
- The New Directions Mothers and Babies Services provides Indigenous children and their mothers with information about baby care, practical advice about parenting, monitoring of developmental milestones and health checks and referrals for treatment before children start school.

- The Tackling Indigenous Smoking initiative includes awareness raising activities to reduce exposure to passive smoking in families, especially children.
- The Medicare Benefits Scheme (MBS) health check for Indigenous Australians (item 715) includes a requirement to check ear health.
- The Australian Government administers vaccination programs for Indigenous Australians through the National Immunisation Program. The Haemophilus Influenzae type b (Hib) vaccination has been demonstrated to reduce the incidence of ear infection.

Ear and hearing health guidance: policies, reports and inquiries

Recent Australian government inquiries, reports and policies related to Aboriginal and Torres Strait Islander ear and hearing health include:

- Hear Us: Inquiry into hearing health in Australia, 2010, Senate Community Affairs References Committee
- Examination of Australian Government Indigenous ear and hearing health initiatives, 2017, Siggins Miller Consultants, commissioned by the Department of Health
- Still waiting to be heard: Inquiry into the Hearing Health and Wellbeing of Australia, 2017, the Standing Committee of Health, Aged Care and Sport
- Roadmap for Hearing Health, 2019, Hearing health Sector Committee
- Commitment to end avoidable deafness among Indigenous Australians, Australia's Long Term Health Plan, August 2019
- Inquiry into the 2017–18 annual reports of the Department of Health and Australian Hearing, 2019, House of Representatives Standing Committee on Health, Aged Care and Sport
- Review of the Hearing Services Program, 2021, Hearing Review Taskforce

Appendix D: Indigenous-specific health check checkbox

The sample questions for infants and preschool children (0–5 years) and older people (50 and over) are presented

a) Infants and preschool children (0–5 years)

Ear health and hearing

Is there anything that you are worried about with your child's listening?
 Yes No Details:

Is there anything you are worried about with your child's language/talking?
 Yes No Details:

Do you notice snoring/noisy breathing at night/while your child is sleeping?
 Yes No Details:

Date of last hearing test (audiology):

Ear examination

Otoscopy (video otoscopy if possible, allows for parental education and for images to be saved for tracking over time)

Otoscopy findings (may be more than one of these):

| Left ear | Right ear |
|---|---|
| <input type="checkbox"/> Clear and intact | <input type="checkbox"/> Clear and intact |
| <input type="checkbox"/> Dull and intact | <input type="checkbox"/> Dull and intact |
| <input type="checkbox"/> Discharge | <input type="checkbox"/> Discharge |
| <input type="checkbox"/> Grommet in canal | <input type="checkbox"/> Grommet in canal |
| <input type="checkbox"/> Grommet in eardrum | <input type="checkbox"/> Grommet in eardrum |
| <input type="checkbox"/> Perforation | <input type="checkbox"/> Perforation |
| <input type="checkbox"/> Red/bulging | <input type="checkbox"/> Red/bulging |
| <input type="checkbox"/> Retracted | <input type="checkbox"/> Retracted |
| <input type="checkbox"/> Unable to view eardrum | <input type="checkbox"/> Unable to view eardrum |
| <input type="checkbox"/> Wax | <input type="checkbox"/> Wax |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: |

b) Older people (50 and over)

Ear health and hearing

Is there anything that you are worried about with your hearing?
 Yes No Details:

Last hearing test (audiology):

Ear examination

Otoscopy R L

Details:

Source: RACGP 2021.

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Abbreviations

| | |
|-----------|--|
| ABS | Australian Bureau of Statistics |
| ABDS | Australian Burden of Disease Study |
| ACCHO | Aboriginal Community Controlled Health Organisations |
| ACT | Australian Capital Territory |
| AEDC | Australian Early Development Census |
| AH&MRC | Aboriginal Health and Medical Research Council |
| AHMAC | Australian Health Ministers Advisory Council |
| AHPRA | Australian Health Practitioner Regulation Agency |
| AIHW | Australian Institute of Health and Welfare |
| AMS | Aboriginal Medical Services |
| ANZSCO | Australian and New Zealand Standard Classification of Occupations |
| ASOHNs | Australian Society of Otolaryngology Head and Neck Surgery |
| ASR | Age-standardised rate |
| CIS | Client Information Systems |
| COAG | Council of Australian Governments |
| COVID-19 | Coronavirus disease 2019 |
| CSO | Community Services Obligation |
| dB | Decibels |
| ED | Emergency department |
| ENT | Ear, nose and throat |
| FTE | Full-time equivalent |
| GP | General Practitioner |
| HAPEE | Hearing Assessment Program – Early Ears |
| HATS | Hear And Talk Scale |
| HEBHBL | Health ears, better hearing better listening |
| Hib | <i>Haemophilus influenzae</i> type b |
| HSP | Hearing Services Program |
| ICD-10-AM | International Classification of Disease, 10th edition, Australian modification |
| LOCHI | Longitudinal Outcomes of Children with Hearing Impairment |
| MADIP | Multi-Agency Data Integration Project |
| MBS | Medicare Benefits Schedule |

| | |
|----------|--|
| NACCHO | National Aboriginal Community Controlled Health Organisation |
| NAPLAN | National Assessment Program – Literacy and Numeracy |
| NATSIHS | National Aboriginal and Torres Strait Islander Health Survey |
| NDIA | National Disability Insurance Agency |
| NDIS | National Disability Insurance Scheme |
| NESWTDC | National Elective Surgery Waiting Times Data Collection |
| NHMD | National Hospital Morbidity Database |
| nKPI | national Key Performance Indicators |
| NNAPEDCD | National Non-admitted Patient Emergency Department Care Database |
| NSAIDs | non-steroidal anti-inflammatory drugs |
| NSW | New South Wales |
| NT | Northern Territory |
| NTRAI | Northern Territory Remote Aboriginal Investment Hearing Health |
| NGO | Non-government organisation |
| OSR | Online Services Report |
| OT | Occupational therapist |
| PLUM | Parents Evaluated Listening and understanding Measure |
| Qld | Queensland |
| RACGP | Royal Australian College of General Practitioners |
| SA | South Australia |
| SP | Speech pathologist |
| Tas | Tasmania |
| UNHS | University Neonatal Hearing Screening |
| Vic | Victoria |
| VII | Voluntary Indigenous Identifier |
| WA | Western Australia |
| WHO | World Health Organization |
| YLD | Years Lived with Disability |

Symbols

- nil or rounded to zero
- . . not applicable
- n.a. not available
- n.p. not publishable because of small numbers, confidentiality or other concerns about the quality of the data

Glossary

Aboriginal and Torres Strait Islander health practitioner: A person who has completed a Certificate IV in Aboriginal and/or Torres Strait Islander Primary Health Care (Practice) and is registered with the Aboriginal and Torres Strait Islander Health Practice Board of Australia. The practitioner may undertake higher levels of clinical assessment and care within their agreed scope of practice.

Aboriginal and Torres Strait Islander health worker: An Aboriginal and/or Torres Strait Islander with a minimum qualification in the field of primary health-care work or clinical practice. This includes Aboriginal and Torres Strait Islander health practitioners who are one speciality stream of health worker. Health workers liaise with patients, clients and visitors to hospitals and health clinics, and work as a team member to arrange, coordinate and deliver health care in community health clinics.

Aboriginal Community Controlled Health Services: Primary health care services initiated and operated by local Indigenous communities to deliver comprehensive, holistic and culturally-appropriate health care to the community that controls it through a locally elected board of management. These services range from large multi-functional services employing several medical practitioners to small services that rely on nurses and/or Aboriginal health workers. For more information, see the National Aboriginal Community Controlled Health Organisation (NACCHO) website. See also **Indigenous-specific primary health care organisations**.

Aboriginal and/or Torres Strait Islander: A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander. See also **Indigenous**.

Acute: A medical condition that comes on suddenly and lasts for a limited time.

acute otitis media: The general term for both acute otitis media without perforation and acute otitis media with perforation. It is the presence of fluid behind the tympanic membrane plus at least 1 of the following: bulging tympanic membrane, fever, ear pain or irritability.

acute otitis media (AOM) without perforation: The presence of fluid behind the tympanic membrane, plus at least 1 of the following: bulging tympanic membrane, red tympanic membrane, fever, ear pain or irritability. A bulging ear drum and/or ear pain are the most reliable indicators of AOM without perforation.

acute otitis media (AOM) with perforation: AOM presentation with discharge of pus through a perforation in the tympanic membrane for less than 2 weeks. The perforation is usually very small (a pinhole) when the tympanic membrane first ruptures. The perforation can heal and re-perforate after the initial onset of AOM with perforation.

additional diagnosis: The diagnosis of a condition or recording of a complaint – either coexisting with the principal diagnosis or arising during the episode of admitted patient care (hospitalisation), episode of residential care or attendance at a health-care establishment – that requires the provision of care. Multiple diagnoses may be recorded.

Addition to an elective surgery waiting list: The process whereby a patient is placed on a public hospital waiting list for elective surgery.

Admission: The process whereby the hospital accepts responsibility for the patient's care and/or treatment. Admission follows a clinical decision based upon specified criteria that a patient requires same-day or overnight care or treatment. METeOR id: 327206.

Admissions from elective surgery waiting lists: Episodes for patients who were admitted (removed from the waiting list) for their awaited elective surgery. Patients can be admitted for surgery from an elective surgery waiting list as an Elective admission or Emergency admission.

Admitted patient: A patient who undergoes a hospital's formal admission process to receive treatment and/or care. This treatment and/or care is provided over a period of time, and can occur in hospital and/or in the person's home (for hospital-in-the-home patients). METeOR id: 268957.

age-specific rate: A rate for a specific age group. The numerator and denominator relate to the same age group.

age-standardisation: A way to remove the influence of age when comparing populations with different age structures. This is usually necessary because the rates of many diseases vary strongly (usually increasing) with age. The age structures of the different populations are converted to the same 'standard' structure, and then the disease rates that would have occurred with that structure are calculated and compared.

allied health professional: A health professional who is not a doctor, nurse or dentist. Allied health professionals include (but are not limited to) audiologists, chiropractors, occupational therapists, optometrists, osteopaths, pharmacists, physiotherapists, podiatrists, psychologists and speech pathologists.

antenatal: The period covering conception up to the time of birth. Synonymous with prenatal.

antenatal care: A planned visit between a pregnant woman and a midwife or doctor to assess and improve the wellbeing of the mother and baby throughout pregnancy. It does not include visits where the sole purpose is to confirm the pregnancy. Also known as an antenatal visit.

bilateral hearing loss: Hearing loss in both ears.

child: A person aged 0–14 unless otherwise stated.

cholesteatoma: A cyst formed due to accumulation and abnormal growth of ear skin cells in a retraction pocket or through a perforation of the tympanic membrane, or in the middle ear space. Due to hyperproliferation of the skin cells the cyst grows, becoming space occupying, often with infection. A cholesteatoma caused by middle ear disease most often occurs in the attic region of the tympanic membrane. Cholesteatomas, where untreated, are arguably the most destructive form of middle ear disease.

chronic: Persistent and long-lasting.

chronic conditions: A term describing a health condition that is persistent and long lasting.

chronic diseases/conditions: A diverse group of diseases/conditions, such as heart disease, cancer and arthritis, which tend to be long lasting and persistent in their symptoms or development. Although these features also apply to some communicable diseases (infectious diseases), the term is usually confined to non-communicable diseases.

chronic suppurative otitis media (CSOM): Persistent ear discharge through a perforation in the tympanic membrane lasting 2 weeks or more. On otoscopy, the perforation must be viewed and be greater than or equal to 2% of the pars tensa (the tense part of the tympanic membrane).

Clinical urgency: A clinical assessment of the urgency with which a patient requires elective hospital care. METeOR id: 532053.

Community/ primary health care nurse: A nurse working in the community (acute or non-acute) or primary health care setting. This often incorporates a wide variety of roles, such as chronic disease management, child and family health and refugee health.

conductive hearing loss: Hearing loss that results from dysfunction of the outer or middle ear that interferes with the efficient transfer of sound to the inner ear.

congenital hearing loss: Hearing loss that is present from birth. Some causes of congenital hearing loss include genetic factors, infections during pregnancy, premature birth, low birth weight, severe jaundice at birth, and ototoxic medications .

data linkage: The bringing together (linking) of information from two or more different data sources that are believed to relate to the same entity (for example, the same individual or the same institution). This linkage can yield more information about the entity and, in certain cases, provide a time sequence – helping to ‘tell a story’, show ‘pathways’ and perhaps unravel cause and effect. The term is used synonymously with ‘record linkage’ and ‘data integration’.

dry perforation: Presence of a perforation (hole) in the tympanic membrane without any signs of discharge, infection or fluid behind the tympanic membrane. In other definitions this can also be referred to as inactive chronic suppurative otitis media (CSOM) or CSOM without discharge.

Ear, nose and throat surgery: Surgical specialty that treats diseases and problems affecting the ears, nose, throat, head and neck.

ear toileting: A procedure where an ear, nose and throat surgeon clears wax, debris or foreign bodies from the ear canal. It is often used in treating patients with recurrent infections of the ear canal.

Elective surgery: Planned surgery that can be booked in advance as a result of a specialist clinical assessment resulting in placement on an elective surgery waiting list. METeOR id: 568780.

Elective surgery waiting time: When a surgery is elective (planned) and will be conducted in a public hospital (or for public patients treated in private hospitals), patients are placed on a waiting list and assigned an urgency category that indicates the clinically recommended maximum time they should wait for the surgery. The time a patient waits for elective surgery is calculated from the date a patient is placed on the hospital’s waiting list to the date of admission for the surgery. The waiting time is an indication of how easy the service is to access.

Emergency department (ED): A hospital facility that provides triage, assessment, care or treatment for non-admitted patients suffering from a medical condition or injury.

Eustachian tube dysfunction: Negative middle ear pressure associated with compromised equalisation impeding middle ear function and sometimes causing middle ear fluid accumulation.

full-time equivalent (FTE) workforce or workload: A standard measure of the size of a workforce that takes into account both the number of workers and the hours that each works. For example, if a workforce comprises 2 people working full time 38 hours a week and 2 working half time, this is the same as 3 working full time – that is, an FTE of 3.

general practitioner (GP): A medical practitioner who provides comprehensive and continuing care to patients and their families within the community.

grommet: A small tube surgically placed across the eardrum to re-establish ventilation to the middle ear. It is also called 'ventilation tube', 'pressure equalisation (PE) tube', or a 'tympanostomy tube'.

hearing: The sense for perceiving sounds; includes regions within the brain where the signals are received and interpreted.

hearing impairment: Describes the degree of impairment associated with hearing loss in the 'better hearing ear', using a scale of mild, moderate, severe and profound. It is based on degree of deviation from normal thresholds in the 'better ear', calculated as a 3-frequency average of the threshold of hearing (in dB HL): 500 Hz, 1000 Hz and 2000 Hz.

hearing loss: Any hearing threshold response (using audiometry – the testing of a person's ability to hear various sound frequencies) outside the normal range, to any sound stimuli, in either ear. Hearing loss in a population describes the number of people who have abnormal hearing. Hearing loss may affect one ear (unilateral) or both ears (bilateral).

hearing within normal limits: Hearing response that falls within the normal range.

hospitalisation: an episode of hospital care that starts with the formal admission process and ends with the formal separation process. An episode of care can be completed by the patient's being discharged, being transferred to another hospital or care facility, or dying, or by a portion of a hospital stay starting or ending in a change of type of care (for example, from acute to rehabilitation).

household: A group of 2 or more related or unrelated people who usually reside in the same dwelling, and who make common provision for food or other essentials for living, or an individual living in a dwelling who makes provision for his or her own food and other essentials for living, without combining with any other person.

Indigenous: A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander. Used interchangeably with Aboriginal and Torres Strait Islander. See also **Aboriginal or Torres Strait Islander**.

Indigenous-specific primary health care organisations: Primary health care organisations that receive funding from the Australian Government Department of Health to provide primary health care services mainly to Aboriginal and Torres Strait Islander people. The primary health care organisations include **Aboriginal Community Controlled Health Services**, state and territory managed organisations, Primary Health Networks and other non-government organisations.

Indigenous status: Whether a person identifies as being of Aboriginal and/or Torres Strait Islander origin.

infant: A child aged under 1 year.

International Classification of Diseases (ICD): The World Health Organization's internationally accepted classification of death and disease. The 10th revision (ICD-10) is currently in use. The Australian modification of the ICD-10 (ICD-10-AM) is used for diagnoses and procedures recorded for patients admitted to hospitals.

median: The midpoint of a list of observations that have been ranked from the smallest to the largest.

Median waiting time: The mid-point in waiting times for patients who received elective surgery after being placed on a public waiting list. Half of all patients who received a particular type of elective surgery waited less than or equal to the median number of days, while half were on the list for longer than the median waiting time.

Medicare: A national, government-funded scheme that subsidises the cost of personal medical services for all Australians and aims to help them afford medical care. The Medicare Benefits Schedule (MBS) is the listing of the Medicare services subsidised by the Australian Government. The schedule is part of the wider Medicare Benefits Scheme (Medicare).

Ménière's disease: A disorder of the inner ear, involving episodes of vertigo, hearing loss and tinnitus, often with nausea and vomiting.

mild hearing impairment: On average, the quietest sounds that people can hear with their 'better' ear are 21 – 40dB. People with a mild hearing impairment may hear speech, but soft sounds are hard to hear, such as whispers or the consonants on the end of words like 'shoes' or 'fish'. Counselling and hearing aids may be needed.

mixed hearing loss: Hearing loss that has conductive and sensorineural components combined.

moderate hearing impairment: On average, the quietest sounds that people can hear with their 'better' ear are 41–70 dB HL. These people are able to hear and repeat words spoken in raised voice at 1 metre and have difficulty keeping up with conversations without using a hearing aid.

My Health Record: An online platform for storing a person's health information, including their Medicare claims history, hospital discharge information, diagnostic imaging reports, and details of allergies and medications.

myringoplasty: The repair of a perforation of the tympanic membrane (eardrum).

myringotomy: Surgical incision into the eardrum, to relieve pressure or drain fluid.

no ear condition: An intact and normal tympanic membrane with an air-filled middle ear. Also referred to as an aerated middle ear.

non-Indigenous: People who indicated they are not of Aboriginal and/or Torres Strait Islander origin. See also **other Australians**.

Nurse practitioner: A nurse practitioner is a registered nurse educated and authorised to function autonomously and collaboratively in an advanced and extended clinical role.

other Australians: People who indicated they are not of Aboriginal and/or Torres Strait Islander origin and those who did not state their **Indigenous status**. See also **non-Indigenous**.

otitis media: All forms of inflammation and infection of the middle ear. Active inflammation or infection is nearly always associated with a middle ear effusion (fluid in the middle ear space).

otitis media with effusion (OME): The presence of an intact eardrum and middle ear fluid without symptoms or signs of acute infection. Other terms used to describe OME include 'glue ear', 'serous otitis media' and 'secretory otitis media'. OME may be episodic or persistent.

otitis media: An inflammation of the middle ear usually from infection and resulting in temporary hearing loss, particularly in children.

otosclerosis: A cause of deafness in adults affecting certain bones in the ears so they cannot conduct sound normally.

ototoxic: Medications or chemicals that have a toxic effect on the ear or its nerve supply. Hearing loss, balance disorders, and tinnitus can result from ototoxic medications including non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen or naproxen, certain aminoglycoside antibiotics, salicylates, platinum-based anti-cancer therapeutics and the anti-malarial drug quinine, and some diuretic drugs. Ototoxic chemicals include some solvents, asphyxiants, nitriles, and metals and compounds such as mercury and lead.

perinatal: Pertaining to, or occurring in, the period shortly before or after birth (usually up to 28 days after).

prevention (of ill health or injury): Action to reduce or eliminate the onset, causes, complications or recurrence of ill health or injury.

prenatal: The period covering conception up to the time of birth. Synonymous with antenatal.

primary health care: These are services delivered in many community settings, such as general practices, community health centres, Aboriginal health services and allied health practices (for example, physiotherapy, dietetic and chiropractic practices) and come under numerous funding arrangements.

principal diagnosis: The diagnosis established after study to be chiefly responsible for occasioning an episode of patient care (hospitalisation), an episode of residential care or an attendance at the health-care establishment. Diagnoses are recorded using the relevant edition of the International statistical classification of diseases and related health problems, 10th revision, Australian modification (ICD-10-AM).

profound hearing impairment: On average, the quietest sounds that people can hear with their better ear are 91+ dB HL either in soundproof conditions or non-soundproof conditions. These people are unable to hear and understand even a shouted voice. Hearing aids may help in understanding words. Additional rehabilitation is needed, and cochlear implants, lip-reading and sometimes signing are necessary.

remoteness areas: These regions are defined by the Australian Statistical Geographical Standard (ASGS) and based on the Accessibility/Remoteness Index of Australia which uses the road distance to goods and services (such as general practitioners, hospitals and specialist care) to measure relative accessibility of regions around Australia.

remoteness classification: Each state and territory is divided into several regions based on their relative accessibility to goods and services (such as to general practitioners, hospitals and specialist care) as measured by road distance. These regions are based on the Accessibility/Remoteness Index of Australia and defined as Remoteness Areas by either the Australian Standard Geographical Classification (ASGC) (before 2011) or the Australian Statistical Geographical Standard (ASGS) (from 2011 onwards) in each Census year. The five Remoteness Areas are Major cities, Inner regional, Outer regional, Remote and Very remote.

sensorineural hearing loss: Hearing loss that results from dysfunction in the inner ear (especially the cochlea).

severe hearing impairment: On average, the quietest sounds that people can hear with their better ear are 71–90 dB HL, either in soundproof conditions or non-soundproof conditions. These people are able to hear some words when shouted into the 'better' ear. Hearing aids are needed; if no hearing aids are available, lip-reading and signing may be necessary.

social determinants of health: The circumstances in which people are born, grow up, live, work and age, and the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies and politics.

suppurative: Pus produced in response to inflammatory bacterial infections.

tympanic membrane (TM): Refers to the ear drum, a membrane which divides the external auditory canal from the middle ear.

unable to be determined: When a definitive hearing diagnosis is unable to be made, usually due to challenges associated with conditioning to the diagnostic assessment.

unilateral hearing loss: Hearing loss in one ear.

tinnitus: A continual noise in the ears or head, such as ringing, buzzing or clicking.

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Related publications

The following AIHW publications relating to the ear and hearing health of Indigenous Australians might also be of interest:

- AIHW 2022. [Australia's health 2020: Indigenous hearing health](#). Canberra: AIHW.
- AIHW 2022. [Aboriginal and Torres Strait Islander Health Performance Framework](#). Canberra: AIHW.
- AIHW 2022. [Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2018](#). Cat. no: BOD 32. Canberra: AIHW.
- AIHW 2022. [Aboriginal and Torres Strait Islander specific primary health care: results from the nKPI and OSR collections](#). Canberra: AIHW.
- AIHW 2021. [Hearing health outreach services for Aboriginal and Torres Strait Islander children in the Northern Territory](#). Cat.no: IHW 260. Canberra: AIHW.
- AIHW 2021. [Queensland's Deadly Ears Program—Indigenous children receiving services for ear disease and hearing loss](#). Cat.no. IHW 249. Canberra: AIHW.
- AIHW 2013. [National performance indicators to support neonatal hearing screening in Australia: Cancer and Screen Unit Working Paper](#). Cat. no: CAN 73.



This is the inaugural national report on the ear and hearing health of Aboriginal and Torres Strait Islander children and adults. Indigenous Australians experience excessive rates of ear and hearing problems which can have profound impacts on overall health and quality of life. This report brings together information on the prevalence of ear and hearing problems among Indigenous Australians along with insights on key protective and risk factors.

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