Aboriginal Students with Disabilities:

Otitis Media and Conductive Hearing Loss

VOLUME 1

Government
of South Australia

This report is available on the Ministerial Advisory Committee:
Students with Disabilities' website at <www.macswd.sa.gov.au>.

Please note:

The term "parents" denotes all caregivers of children.

The term "Aboriginal" denotes all Indigenous people in South Australia.

In this study the specific term "conductive hearing loss" refers to the fluctuating hearing loss associated with otitis media, and the general term "hearing loss" refers to any hearing loss, which can be conductive or sensorineural.

On July 1, 2006, the Women's and Children's Hospital and Child and Youth Health were brought together to form the Children, Youth and Women's Health Service.

Produced by the Ministerial Advisory Committee:
Students with Disabilities
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Foreword

The Ministerial Advisory Committee: Students with Disabilities reported on the education of Aboriginal children and students with disabilities in 2003. This report was widely distributed and was the impetus for two subsequent projects in 2005 and 2006, focusing on Aboriginal children and students with otitis media and conductive hearing loss.

Project groups were formed to oversee the two projects; participants included representatives of government and non-government education sectors and organisations, Aboriginal health representatives, university personnel, as well as members with knowledge of hearing impairment and Aboriginal education. We would like to express our thanks to all members for their participation. The diverse experience and expertise was important in developing the aims of the project and in guiding and finalising the report.

We would also like to thank all the case study participants and others working in the fields of health, education and disability who volunteered their time to participate in interviews. Case study participants discussed programs dedicated to improving ear and hearing health of Aboriginal children in South Australia, community models for service delivery and collaborative practice.

Participants also raised issues of concern and ways of raising awareness about otitis media and conductive hearing loss affecting Aboriginal children. They provided invaluable information and insight into the needs of Aboriginal children with otitis media and conductive hearing loss and the people who support their health, education and wellbeing.

Findings of the projects are presented in three volumes. Volume 1 includes the executive summary, recommendations, case study summaries and discussion. Volume 2 features the detailed case studies, and Volume 3 contains the information strategies. Each volume caters for a different audience: Volume 1 provides an overview of issues and accompanying analysis for anyone with an interest in the topic, Volume 2 contains detailed information for the communities that were studied, and Volume 3 offers educative strategies for families and health and education practitioners. This booklet is a summary for the use of members of the Inter Ministerial Committee (Child Development).

Finally, we acknowledge the Secretariat staff for their effort and commitment. In particular, we would like to thank Fiona Snodgrass, principal Project Officer, and Christel Butcher, Executive Officer, who managed to distil all the relevant information given to this study by many committed people working in the field of Aboriginal health and education into this final report.

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Executive summary

The inception of this project came out of the recommendations of the *Aboriginal students with disabilities* report produced by the Ministerial Advisory Committee: Students with Disabilities in September 2003. Recommendation 2 stated that "urgent attention should be given to the high levels of recurrent otitis media with conductive hearing loss (OM/CHL) in Aboriginal children and the effect this has on their learning outcomes". Recommended areas of action from the 2003 report included:

- the development of cooperative arrangements between health and education agencies in the early intervention and management of otitis media and conductive hearing loss for Aboriginal children
- information provision and training for educators concerning otitis media and conductive hearing loss and strategies to assist students access the curriculum
- implementation of environmental strategies to improve light and acoustic efficiency of classrooms.

The current project, *Aboriginal students with disabilities: Otitis media and conductive hearing loss,* sought information on programs or initiatives that had been established in selected metropolitan and regional centres of South Australia to address the high prevalence of otitis media and conductive hearing loss in Aboriginal children. Current and past programs were investigated to highlight models that could inform future program development, evidence of collaborative practice—particularly between health and education agencies—and issues of concern that affected program implementation and outcomes (see Appendix 2: Terms of reference).

The original terms of reference also sought information on the process of transition from school to post-school options for Aboriginal students affected by hearing loss. The project findings did not bring to light any such information; therefore, it is difficult to determine the type of transition support required. It is suggested that transition practices for Aboriginal children and students with hearing loss remain a critical issue to be examined, but in the context of transition practices for all students with a disability or impairment.

Health programs examined as part of this study all had similar models for supporting Aboriginal children and students with otitis media and conductive hearing loss. The model included early detection and medical management of otitis media by primary health care services, early detection of hearing loss and audiological management by audiological services and management of speech and language problems by primary health services or the education sectors. The model of early detection and intervention was supported by clinical pathways developed as part of the Clinical Management of Otitis Media in Aboriginal and Torres Strait Islander Populations project (Office of Aboriginal and Torres Strait Islander Health, Department of Health and Ageing, 2001).

A primary health care model incorporating outreach services seemed successful in detecting and managing ear disease and detecting hearing loss, particularly if the outreach services are embedded in Aboriginal health organisations, as they have the greater access to Aboriginal children. However, the referral to allied services such as speech and language and other specialist services is less transparent. It is difficult to ascertain whether the referral processes in place are flawed or whether waiting lists to these services affect the take-up of related services.

The Department of Education and Children's Services (DECS) provides an across-the-state service for supporting children and students with hearing loss in state preschools and schools but has no stated policy focus for Aboriginal children and students with conductive hearing loss as a result of otitis media. However, the recently published DECS *Disability Support Program, 2007 Eligibility Criteria*, includes criteria for the recognition of conductive hearing loss as a verifiable impairment because of its educational impact. This has not occurred consistently in other states. Support for Aboriginal children and students with conductive hearing loss is problematic, as many do not acquire the necessary medical evidence confirming hearing loss. Departmental policy for disability support requires two audiograms within 18 months of each other. Without this evidence students cannot receive individual

support from DECS hearing impairment coordinators, but schools are provided with general advice to address hearing impairment. One DECS district has tried to address this issue by developing a *Referral of child/student with possible conductive hearing loss* pathway to provide support to students with suspected hearing loss whose hearing loss remains unconfirmed.

During the study, examples of successful collaborative practice were evident between Aboriginal health services; Children, Youth and Women's Health Service (CYWHS); Australian Hearing; and the Department of Education and Children's Services or local education sites to improve the ear and hearing health of Aboriginal children and students through early intervention and ongoing management. The Otitis Clinical Support Systems Project, a recent project implemented in the Northern and Far Western Regional Health Service catchment area, aims to extend collaborative practice to include families. Successful collaboration between health and education services was often the result of strong relationships formed by local staff but these could be disrupted when key staff left.

Systemic collaboration seemed more difficult to achieve unless there was political will supported by an institutional framework and a well defined strategy. Local collaboration was working, but collaboration at the policy level in organisations was not evident, except the Commonwealth's commitment to ear and hearing health through the Office of Aboriginal and Torres Strait Islander Health (Department of Health and Ageing). Active collaboration was much more evident among health organisations, with education sites playing a more reactive role and often responding to health programs rather than initiating programs focusing on education's role in improving educational outcomes for Aboriginal students with conductive hearing loss. Gaps in service provision exist and education authorities need to address this to assist Aboriginal children and students with conductive hearing loss as a result of otitis media.

Case study participants also raised a number of concerns including the need for follow-up services for families, access issues, workforce issues and information provision. Referral to and timely provision of ear, nose and throat services for Aboriginal children and students with ear disease remains an ongoing issue of concern and is due in part to the long waiting lists for appointments and surgery. The need for more trained Aboriginal health workers, particularly in ear and hearing health, was also identified as an issue of concern by Aboriginal health and mainstream health organisations. Access for Aboriginal families to primary health care using evidence-based practice for the treatment of otitis media is necessary to address the high prevalence of otitis media and conductive hearing loss.

Aboriginal families have difficulties with accessing medical services for several reasons and these are not limited to physical access barriers such as lack of transport or to not knowing where to readily access help. The study highlighted psychological barriers for families in accessing treatment for children affected by middle ear disease, such as:

- acceptance of ear disease as normal and generational
- resignation concerning long-standing delays for specialist treatment, often resulting in missed appointments
- a general discomfort with mainstream medical settings and attitudes of mainstream medical practitioners.

Aboriginal and Torres Strait Islander people are less likely to access health services, in particular primary health care, than other population groups. This is partly because they are not confident that they will be welcome, or that health staff will understand their needs (Francis in *Southern Health News* 2007, p 5). A playgroup setting is one method employed by health services to improve access for and provide information to Aboriginal families regarding mainstream primary health care services. Murray–Mallee Community Health Service's Nunga playgroup and Southern Primary Health's playgroup at Porli Pulgi (Christie Downs Kindergarten) are two successful examples.

The second part of the project sought to identify information required by families and educators to support Aboriginal children and students with otitis media and conductive hearing loss, and determine currently available information provision by health and education sectors. The majority of participants agreed that community awareness of otitis media and conductive hearing loss and their potentially devastating effect on Aboriginal children's development, particularly social and emotional wellbeing, is necessary. Participants stated

that information on the impact of otitis media and subsequent conductive hearing loss, particularly the impact of hearing loss on educational outcomes, is paramount.

However, further analysis of the case studies highlighted that information sought by parents and educators is of a more immediate nature and included information on how to easily recognise and respond to middle ear disease and/or hearing loss, particularly how and where to seek timely intervention. Availability of information and resources concerning the prevention of conductive hearing loss was not raised by study participants, possibly indicating a general acceptance of the problem amongst Aboriginal children and students or a limited understanding that conductive hearing loss is the long-term impact of untreated recurring otitis media. The study highlights that there is a need to broaden parents' and educators' understanding of how otitis media affects Aboriginal children and students; that is, that they are often affected by recurring pattern of infection which starts early in life and can increase in severity if left untreated. Parents and educators would benefit from information explaining the short-, medium- and long-term impacts of recurrent ear disease for this population of children and students but, most importantly, they need to be aware of the fact that the impact of otitis media, particularly the long-term impact, for Aboriginal children will be different from non-Aboriginal children and will add to the disadvantage of Aboriginal children and students affected by otitis media.

The study also sought to determine the preferred methods of information provision required by families and educators. Families preferred information presented face-to-face by people that were known to the community and in a forum that fostered the sharing of information. Educators sought practical information that enabled them to recognise hearing loss and resources that detailed successful teaching strategies.

Raising the awareness of families, educators and health workers of the long-term impacts of otitis media and conductive hearing loss on children's health, education and social and emotional wellbeing is important in addressing the high incidence of otitis media and hearing loss affecting Aboriginal children and students. A number of programs recognise this fact and have included community education as part of their model. However, barriers to implementation result in little community education being delivered. Targeting information provision using suitable formats will address this shortfall.

Key Findings

Information

- The study revealed that there is limited understanding among participants that otitis media affects Aboriginal children differently from non-Aboriginal children, and that a pattern of recurrent infection from a very young age has the potential to cause persistent conductive hearing loss and associated issues.

- Families, educators, and care and early childhood personnel are aware of the immediate effects of otitis media, but have less understanding of the impact of conductive hearing loss on child development and learning outcomes of Aboriginal children.

- The hidden nature of hearing loss and rate of disability among Aboriginal children is highlighted by the disparity between studies showing a high prevalence of otitis media and conductive hearing loss in Aboriginal communities and the relatively low identification of hearing loss by health and education professionals and families in this study.

- Interviews with Aboriginal families highlight the prevalence of ear disease and hearing loss among families and over generations.

Programs

- The first targeted program with a statewide focus was the Australian Government's national program to address Indigenous ear and hearing health, the Indigenous Hearing Health Program, which commenced in 1996.

- Up until the implementation of the Otitis Media Clinical Support Systems Program (based in Port Augusta), existing ear and hearing health programs for Aboriginal children have evolved services towards junior primary school age children, although the original target group for the national program was from birth to five years of age, as otitis media is common in infants and younger children.

- Of all the programs investigated, only one program—the Otitis Media Clinical Support Systems Program—actively supports and empowers families with young children to make timely decisions about accessing medical assistance.

- There is evidence that preventative and remedial initiatives are implemented by some local care and education teams who participated in this study; initiatives included health promotion activities, classroom strategies and management of the acoustic environment. There was little evidence of the use of specific teaching strategies for children with a history of conductive hearing loss, poor listening skills and poor speech and language.

- The absence of regular and efficient data collection from primary health or screening programs makes it difficult to determine the size and type of ear disease and hearing loss experienced by Aboriginal children in different communities.

- Primary child health programs with a focus on ear and hearing health are working well but follow-up specialised support and services continue to be problematic and ad hoc.

Barriers

- There are numerous barriers for families accessing services, including physical and personal barriers.

Specific actions

- Pre-natal, infant, maternal and early childhood programs for Aboriginal families need to consider otitis media and conductive hearing loss when working with Aboriginal families and plan appropriate preventative initiatives and interventions.

- Screening programs help to identify ear infection early and initiate appropriate treatment, as well as raising awareness of otitis media and conductive hearing loss among families and educators.

- Home visiting is an effective method of communicating with Aboriginal families and is used by services that engage with them regularly.

- Families and health and education agencies need to work together from before children's birth and need to continue their collaboration throughout infancy, early childhood and the schooling years to prevent or minimise the effects of conductive hearing loss on Aboriginal children's development. As stated in the 2007 Australian Medical Association's Report Card on Aboriginal and Torres Strait Islander Health: "much prevention lies outside the health system in education, housing and economic sectors".

Recommendations

The Ministerial Advisory Committee: Students with Disabilities supports the comprehensive findings of key studies on Aboriginal children and otitis media and hearing loss and recommends them as a reference tool for policy makers, professionals and practitioners.

These studies include:

1. *Recommendations for Clinical Care Guidelines on the Management of Otitis Media (Middle Ear Infection) in Aboriginal and Torres Strait Islander Populations* (Office of Aboriginal and Torres Strait Islander Health, Commonwealth Department of Health and Ageing, 2001
2. *Learning Lessons - An Independent Review of Indigenous Education in the Northern Territory*. Department of Education, Darwin, 1999.
3. *The Western Australian Aboriginal Child Health Survey.* Curtin University of Technology and Telethon Institute for Child Health Research, Perth, 2005
4. *Do you hear what I hear? Living and learning with conductive hearing loss/otitis media resource kit*. Department of Education, East Perth, 2002.

In the current study, the Ministerial Advisory Committee: Students with Disabilities recommends the implementation of the information strategies in Volume 3 to address the awareness needs of all groups identified in the report. The information strategies are based on the findings recorded in Volumes 1 and 2. The strategies aim to:

1. **Raise awareness of parents and facilitate understanding of the social, emotional and educational impacts of conductive hearing loss, as a first step in a process of building knowledge and commitment to action, through**

    - developing an information package for families on the long-term impact of otitis media and conductive hearing loss on child development based on evidence from the study and information materials already available
    - developing this package in collaboration with Aboriginal families and health services.

2. **Support a collaborative early childhood intervention approach by health, early childhood and education services to ameliorate speech and language difficulties, behavioural difficulties and other issues that may arise from otitis media and conductive hearing loss in young Aboriginal children, by**

    - raising awareness and developing practical information packages targeting general practitioners, home visiting programs, childcare centres, early childhood centres and kindergartens
    - developing this early intervention approach in collaboration with student support and disability teams, Aboriginal educators, and relevant statewide services, including mainstream and Aboriginal health services and child health units
    - advocating for a whole-of-government policy approach to develop a cooperative health–education framework to address the prevalence of otitis media and conductive hearing loss among Aboriginal children and students in South Australia, supporting the goals of South Australia's updated Strategic Plan (eg T6 18)
    - including an assessment of service take-up by Aboriginal families in a possible future evaluation of the Department of Education and Children's Services' new Children's Centres for Early Childhood Development and Parenting.

3. **Support the collation and distribution of information for early childhood carers, educators and education support staff to provide support to Aboriginal children and students with or at risk of conductive hearing loss, through**

    - developing or sourcing a web-based information resource (eg such as Indigenous Ear*InfoNet*) for care, education and disability personnel on strategies and information for teaching Aboriginal children and students with conductive hearing loss. This needs to occur in collaboration with student support and disability teams, relevant statewide services and Aboriginal educators.

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1. Introduction

Background

What is otitis media?
Otitis media is an inflammation of the middle ear, common among children in Australia and known as middle ear infection. Conditions identified as otitis media include:

- otitis media with effusion—fluid in the middle ear (glue ear)
- acute otitis media—inflammation of the middle ear of recent development or exacerbation, often with pain, fever or feeling unwell, with/without eardrum perforation
- chronic suppurative otitis media—chronic infected discharge from perforated eardrums (runny ear)
- recurring otitis media.

What is conductive hearing loss?
Conductive hearing loss is defined as a reduction in the efficiency with which external sound reaches the nerve endings of the inner ear due to mechanical impediment in the outer ear (ear canal) or middle ear (the tympanic membrane and ossicles of the eardrum). Conductive hearing loss may reduce hearing acuity slightly, mildly or moderately (as defined below) rarely severely. In addition, a conductive hearing loss may disturb the ability to locate the source of sound, and to attend to speech heard against competing noise. This type of hearing loss may potentially be restored by medical or surgical intervention.

Aboriginal children and otitis media and conductive hearing loss
It is a well established fact that Aboriginal children have a higher prevalence of otitis media and experience longer periods of conductive hearing loss than non-Aboriginal children (Couzos, 2001 & Zubrick et al, 2004). Aboriginal children are more likely to suffer from chronic otitis media (either “glue ear” or “runny ear”). Non-Aboriginal children are also likely to experience episodes of otitis media with effusion (fluid in the middle ear), with many experiencing at least one episode of acute otitis media by age three. It is estimated that Aboriginal children suffer from otitis media ten times more often than their non-Aboriginal peers.

Research suggests that otitis media with effusion begins in the first weeks of life for many Aboriginal infants (Boswell & Neinhuys, 1996, Boswell, 1997, Coates et al 2002 and Zubrick et al, 2004. The condition often goes undetected and therefore untreated and can result in recurring ear disease. Recurrent acute otitis media can lead to chronic conditions such as constant fluid behind the ear, chronic otitis media with effusion (glue ear), perforated eardrums that discharge (runny ear), and chronic suppurative otitis media. Poverty-related risk factors such as overcrowding, inadequate housing, and large families in close habitation can influence the prevalence and degree of ear disease. Rates of otitis media vary between Aboriginal communities, and studies show clearly that more remote areas have the highest prevalence of chronic suppurative otitis media. A recent study conducted in the southern suburbs of Adelaide (Sanchez, 2006) highlighted that urban school-aged Aboriginal children screened in this geographic area had relatively good ear health and hearing. A subsequent study in the northern study in 2007 by the same researcher showed that school-aged children’ s ear health and hearing in this region was poorer than that of their southern peers. This highlights the fact that rates of otitis media vary even in metropolitan Adelaide.

Although many Aboriginal children will not experience chronic otitis media, nearly all Aboriginal children will be exposed to otitis media. For many Aboriginal children, otitis media is not temporary but ongoing.

Otitis media causes fluctuating conductive hearing loss that may be either transient or persisting. Children’s ability to hear clearly can be reduced by

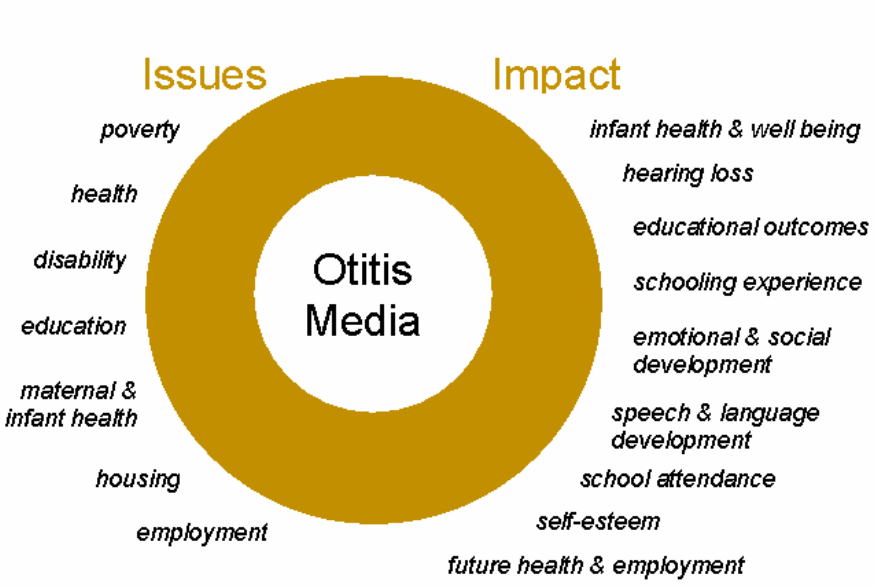
- fluid, instead of air, behind the tympanic membrane
- discharge from the ear during a current ear infection
- a hole in the eardrum from repeated perforation, or
- scarring, adhesion or destruction of middle ear structures.

The degree and duration of hearing loss is variable, even from day to day. Whereas, for a child with otherwise healthy ears, hearing may recover within a week or two following an acute otitis media episode, for a child with chronic otitis media, the hearing loss may persist for many weeks or months after an acute episode.

A chronic pattern of otitis media—a common experience among Aboriginal children—causes more frequent and longer episodes of hearing loss and can result in persistent deafness. Long periods of deafness can affect children's development, particularly language exposure and acquisition, literacy development and, in turn, social and emotional development. Delay in language and literacy development from ongoing hearing loss can contribute to other schooling/vocational issues. These include absenteeism and challenging behaviour and affect long-term opportunities for study and employment.

The prevalence of otitis media in Aboriginal children in Australia is well documented and has become an important consideration for Aboriginal health (Zubrick et al, 2004 and Couzos et al, 2001) Otitis media is primarily a medical condition but conductive hearing loss and the risk of permanent or persistent hearing loss in Aboriginal children require a community response from a range of participants, including education and care providers.

The impact of conductive hearing loss on the development of language and literacy for Aboriginal children highlights the need for a multi-dimensional collaborative response from education and other service providers. Hearing loss affects learning, schooling retention, social and emotional development and can limit long-term opportunities for study and employment. Lack of education and employment can impact on health later in adult life.



Impact of conductive hearing loss on language, communication and literacy

Children learn speech and language from listening to other people talk. The first few years of life are especially critical for this development. A child cannot get the full benefit of language learning experiences if hearing loss reduces exposure to language. If a hearing loss is not detected and early steps are not taken to ameliorate its effects, a child may miss out on some of the information that can influence speech and language development. These negative effects are likely to be compounded in Aboriginal children, many of whom have to adapt to an educational environment where the language and culture may differ from that of their home environment.

The most common cause for temporary hearing loss in children is fluid in the middle ear space, associated with ear infections. (Children, Youth and Women's Health Service, 2007) The eardrum cannot vibrate freely, resulting in a 15–50 decibel (dB) hearing loss (HL).

A child with a mild hearing loss (15 dB HL–35 dB HL) will not hear when the speaker talks quietly, is at a distance or facing away, and will have difficulties understanding speech when background noise is present. The effect of a mild hearing loss on language development may be influenced by other factors.

Children with a moderate hearing loss (40 dB HL–50 dB HL), in addition to the above, will not hear all the sounds of normal conversational speech, but will require a reinforced, louder level from the speaker. Children with a moderate hearing loss are likely to have significantly reduced exposure to language, and thus experience of its use; they show delayed development of expressive language, may have a limited vocabulary, omit quiet linking words such as “a”, “the” and tense markers, and use pronouns, prepositions and other words inappropriately. The frequent misunderstandings that arise in their interaction with others, and the more aggressive attitude that may accompany the louder voice required of their carers have effects on their self-confidence and psychological development.

Researchers agree that children who have had limited or disrupted access to auditory stimulation and spoken language, such as brought about by conductive hearing loss, may have “long-term effects on early communication, language, auditory processing, psychological and cognitive development, and subsequent educational progress” (World Health Organisation, November 1998, p 11).

Students may have difficulties with auditory discrimination, blending of sounds, articulation and hearing unstressed word beginnings and endings. All of these difficulties may lead to problems with understanding what is said and making oneself understood.

Studies have confirmed that the use of soundfield amplification systems in classrooms improves the acoustic environment for children affected by conductive hearing loss, as the amplified sound enables children to better hear and understand the teacher in noisy environments. Unfortunately, a number of factors have impeded widespread implementation, including concerns with cost and use of technology.

2. Project design

Aim

This study was undertaken at the request of the Minister for Education and Children's Services to provide her with information regarding services available to Aboriginal children in South Australia with or at risk of developing conductive hearing loss after recurrent or chronic otitis media.

Recommendation 2 in the *Aboriginal students with disabilities* report, produced in September 2003 by the Ministerial Advisory Committee: Students with Disabilities, stated that "urgent attention should be given to the high levels of recurrent otitis media with conductive hearing loss (OM/CHL) in Aboriginal children and the effect this has on their learning outcomes". Recommended areas of action included greater inter-agency collaboration, information and training for education personnel and improved implementation of environmental strategies in preschools and schools.

The aim of this study, therefore, was to examine programs or initiatives established in selected metropolitan and regional centres of South Australia to address the high prevalence of otitis media and conductive hearing loss in Aboriginal children. Current and past programs were investigated to highlight:

- models[1] that could inform future program development
- evidence of collaborative practice — particularly between health and education agencies
- issues of concern that affect program implementation and outcomes.

The study also identified appropriate information and approaches for use with families, educators and health workers to raise awareness about the short- and long-term effects of otitis media with conductive hearing loss on child development. This culminated in the production of information strategies (Volume 3) for practitioners, which are an addendum to the original project.

Investigation methods

Data for this study were gathered through comparative case studies in Ceduna, Murray Bridge, the northern suburbs of Adelaide and Port Augusta, recording:

- health and education programs
- models used
- evidence of collaboration
- awareness raising activities
- issues of concern.

This project focused on Aboriginal children's and students' experience of otitis media and conductive hearing loss. The project involved Aboriginal families and organisations providing relevant services to them, such as Children, Youth and Women's Health Service and Australian Hearing. All education sectors (state, Catholic and Independent) participated, and a range of participants from care and school settings with significant Aboriginal enrolment in remote, rural, regional and urban locations were interviewed.

Supporting data were sourced from:

- interviewing education, health and disability professionals
- surveying hearing impairment coordinators (and their equivalents in Catholic and Independent school sectors)
- undertaking a literature review.

The study focused on metropolitan and regional areas, where most Aboriginal children and students live, but excluded the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands. It is recognised that Aboriginal children living in remote areas are known to be most affected by chronic otitis media and related conductive hearing loss, however, at the time of this study,

[1] A documented articulation of an agreed process or system between groups.

research into hearing and ear health of children on the Lands was already being conducted by another agency.

Target population

The project focused on Aboriginal children's and students' experience of otitis media and conductive hearing loss. The project involved Aboriginal families and organisations providing relevant services to families. All education sectors (state, Catholic and Independent) participated and a range of care and school settings with significant Aboriginal enrolment in remote, rural, regional and urban locations were included.

3. Summaries of project case studies

Background

The Aboriginal population
The Aboriginal population of South Australia is 23 425 of a total state population of 1 458 912 and accounts for just 1.6 per cent. A breakdown of the total Aboriginal population shows there are 9011 children aged up to fourteen years old (ie 38.4 per cent), which accounts for only 0.6 per cent of the whole state population. A further breakdown delineates between 2930 Aboriginal children aged up to four years old (ie 12.5 per cent) and 6081 Aboriginal children aged five to fourteen years (ie 25.9 per cent).

The statistics for Aboriginal children up to fourteen years old, sourced for the four case study locations, account for over one-third (34.5 per cent) of all Aboriginal children up to fourteen years old living in South Australia. A table of these figures follows.

Case study location	**0–4 yrs**	**5–9 yrs**	**10–14 yrs**	**Total**
Ceduna	98	109	116	323
Murray Bridge	107	108	77	292
Northern suburbs of Adelaide	706	756	711	2173
Port Augusta	261	254	246	761
Total number	*1009*	*1082*	*1020*	*3111*
Total percentage	*32.4*	*34.8*	*32.8*	*100*

(Source: 2001 Census of Population and Housing: Indigenous Profile)

Location of population
Adelaide has the largest single community of Aboriginal people within the state and is the focal point for many Aboriginal organisations. Approximately 45 per cent of the state's Aboriginal population lives in metropolitan Adelaide and a significant proportion resides in the northern and north-western suburbs, a growing trend since 1986. The local government areas of Salisbury and Port Adelaide have the highest concentration of Aboriginal people, followed by Enfield, Munno Para–Playford and Elizabeth areas. In 2001, the Aboriginal population of the six most populated northern suburbs was 6171 (26 per cent); that is, just over a quarter of the state's Aboriginal population lives in the northern and north-western suburbs of Adelaide (Hugo 2003).

The proportion of the Aboriginal population in "other urban areas" is almost one third of the state's Aboriginal population. There was a strong increase in migration to other urban areas from 1971 to 1986, but migration remained steady from 1986 onwards (Hugo 2003). The urban centre with the highest proportion of Aboriginal population is Port Augusta, followed by the Ceduna and Murray Bridge areas. The most significant change over the last thirty years is the strong population growth in Murray Bridge. In 1971, Murray Bridge had an Aboriginal population of 178 and by 2001 this population had increased to 695.

The data highlight that the Aboriginal population of South Australia is small, young, and highly concentrated, with approximately 77 per cent of the state's Aboriginal population living in urban locations.

Otitis media and conductive hearing loss statistics
It is a well established fact that Aboriginal children have a higher prevalence of otitis media and experience longer periods of conductive hearing loss than non-Aboriginal children,

particularly in rural and remote areas (Couzos 2001 & Zubrick et al, 2004) Aboriginal children are much more likely to suffer from chronic otitis media, either otitis media with effusion ("glue ear") or chronic suppurative otitis media ("runny ear"). In remote and rural areas, Aboriginal children are more likely to suffer from recurrent and discharging otitis media (runny ear). The Western Australian Aboriginal Child Health Survey found the prevalence of recurrent infection and discharging ears increased significantly with increasing isolation. However, the prevalence of recurrent infection with no discharge varied little by isolation (Zubrick et al, 2004) Studies have also shown that levels and severity of ear disease vary between communities, and often this can be attributed to the environmental conditions of individual communities (Coates et al 2002).

Over the past forty years, a number of studies have been conducted to obtain data determining the extent and severity of ear disease and hearing loss in the Aboriginal population. Few of these studies have occurred in South Australia and, because many have used different methods, it is difficult to compare and generalise study results.

However, early studies, such as Stuart's 1972 study of children attending Cherbourg state school in Queensland, and the National Trachoma and Eye Health program (a national study which contained an ear assessment component), brought to national and international attention the high level of ear disease and conductive hearing loss experienced by Aboriginal Australians. Later studies added to the information base on otitis media and Aboriginal people, particularly the studies by Boswell and Neinhuys (1996) and Boswell (1997) on Aboriginal infants in Northern Territory communities. This latter study revealed that Aboriginal infants were likely to experience their first episode of otitis media in the first six weeks of life, unlike non-Aboriginal children.

An important feature of later studies is evidence showing some improvement in the levels of ear disease and hearing health of Aboriginal Australians. The study by Sockalingam and others at Cherbourg (Queensland) in 2000 adds to this evidence base. Sockalingam and colleagues visited Cherbourg state school to repeat Stuart's study of 1972 and to assess whether any changes, particularly improvements in hearing health, had occurred over the previous thirty years. The results of the study showed a significant decline in the prevalence of hearing loss in Aboriginal children at Cherbourg State Primary School since Stuart's 1972 study, but indicated that ear disease continued to be a significant problem in the Cherbourg community. The study concluded that "the findings did reveal that the type of ear pathology in the Aboriginal population is increasingly resembling that of the general population as the number of perforations was found to be significantly lower than that reported in 1972" (Sockalingam et al 2003, p 52).

A metropolitan study, conducted in 2005–06 by the Department of Speech Pathology and Audiology, Flinders University of South Australia, of 185 Aboriginal schoolchildren from state schools in the southern suburbs of Adelaide also found that the hearing health and presence of perforations were comparable to non-Aboriginal children. This study highlighted that the urban school-aged Aboriginal children had good ear health and good hearing (Sanchez 2006).

Sockalingam et al identified a range of factors that may have contributed to the improvement of ear health. These included:

- a general increase of the socioeconomic status of the community
- improved general health status
- an overall increased awareness of ear health in the Cherbourg community over the previous three decades, with a focus on hearing issues
- the inclusion of ear health as one of the ten major health aims outlined in the Ten Point Plan of the Cherbourg Action Group, an Indigenous health worker group
- conduct of biannual audiological screening and otologic monitoring of Cherbourg schoolchildren by the Cherbourg Community Health Service
- the installation of a sound field amplification system in one of the classrooms.

(2003, p 52)

Many of these factors were present in the communities studied for this project. Unfortunately, no statistics on ear and hearing health could be obtained for the areas under study, so it is not possible to validate whether any of these interventions are contributing to improved outcomes for this group of Aboriginal children, although it is suggested that this may be the case.

Improvement in ear and hearing health may be the reason that a number of participants could not identify otitis media or conductive hearing loss amongst the children they supported. However, it may also be due to the fact that for many study participants otitis media is synonymous with runny, discharging ears. Less obvious forms of otitis media, such as otitis media with effusion, are not so easy to identify.

Study results suggest that the pathology for Aboriginal children in urban areas may have changed from suppurative otitis media (runny ear) to otitis media with effusion (glue ear). This is supported by anecdotal evidence given at interviews that children seem to be progressing well, and it is not until their ears and hearing are screened that a problem is detected. Children with fluid in the middle ear may not have the symptoms of an acute infection, and this is why screening for this problem has been suggested (Couzos et al 2001). Screening and suitable intervention programs will continue to be required to detect any hearing loss resulting from otitis media which, when left undetected and untreated, would impact on speech and language development in young children and educational and social outcomes in older children and adults.

Where there is no change in environmental conditions within Aboriginal communities or the existence of primary health care and promotion programs, the prevalence of otitis media and subsequent hearing loss will probably be quite high. It is recommended that regular screening to help identify ear infection early, as well as initiate appropriate treatment, may help reduce ear disease in Aboriginal children (Couzos et al 2001).

Case study summaries

Parallel case studies were conducted in Ceduna, Murray Bridge, the northern suburbs of Adelaide, and Port Augusta. Each area has a significant population of Aboriginal people, with children up to age fourteen of particular interest. A statewide project was not possible but the locations give a snapshot of four distinct regions: a major city, an inner regional area, an outer regional area and a remote area.

The case studies sought information on programs run by health and education services that detect, diagnose, treat or prevent otitis media and associated conductive hearing loss for Aboriginal children. Information was sought on the strengths and gaps within existing programs and the use of models or processes. In the absence of programs specifically addressing otitis media and conductive hearing loss for Aboriginal children, evidence of health or education initiatives or strategies, particularly at early childhood and education sites, was examined.

The study recorded collaboration between services and between services and families.

Lastly, the study sought suggestions on raising community awareness of this issue. It was hoped that the case studies would provide information on:

- the extent and nature of middle ear disease within South Australia
- programs to address middle ear disease and hearing loss
- a map of ear and hearing health services for Aboriginal children and students.

The four case studies presented in Volume 2 provide detailed information and analysis of the health, care, early childhood and education services available to Aboriginal children and students with otitis media and conductive hearing loss living in the four regions examined in this study. The following information summarises the past and current programs and services available. Like the full case studies in Volume 2, the summarised case studies below are presented by region. The summarised case studies provide an overview of the relevant issues and facts that emerged from the full case studies.

Ceduna

The case study investigated programs or initiatives to address otitis media and conductive hearing loss for Aboriginal children and students in the Ceduna area. Community models, issues of concern, collaboration and community awareness were discussed. A summary of interviews with health and education organisations and individuals is presented below. The full Ceduna case study is documented in Volume 2.

Programs
Programs or initiatives addressing otitis media and/or conductive hearing loss in Aboriginal children are provided by:

- Ceduna–Koonibba Aboriginal Health Service
- Australian Hearing
- Children, Youth and Women's Health Service
- Whyalla Hospital and Health Service
- Department of Education and Children's Services (DECS) Eyre District's hearing impairment coordinator.

Health programs
Ceduna–Koonibba Aboriginal Health Service is one of thirty Child Health Program sites that implement a hearing health program as part of the Australian Government's National Aboriginal and Torres Strait Islander Hearing Strategy. The program is funded by the Office of Aboriginal and Torres Strait Islander Health, Department of Health and Ageing.

The Hearing Health Program consists of a dedicated hearing health worker whose role is to provide community education and outreach primary health care services for Aboriginal children with otitis media. Ear health and hearing screening includes using audiometric equipment: an otoscope for checking the eardrum, a tympanometer for measuring middle-ear function and an audiometer for testing hearing.

Detecting and diagnosing ear disease and conductive hearing loss by the hearing health worker is followed up with referral for medical treatment or audiological services (provided by Australian Hearing). This primary hearing health care is provided to Aboriginal infants at health service clinics and through an outreach service for Aboriginal children at childcare centres, preschools and schools. The outreach is available only on request. Koonibba Child Care Centre uses the service, as does Crossways Lutheran School which each year requests three visits from the hearing health worker.

Australian Hearing, whose core service is tertiary health care to rehabilitate children with hearing loss and to provide hearing aids, works in partnership with Ceduna–Koonibba Aboriginal Health Service to implement the Hearing Health Program. Australian Hearing also does outreach visits to individual schools, such as Crossways Lutheran School, as part of its Specialist Programs for Indigenous Australians (AHSPIA) program.

The DECS hearing impairment coordinators use the services of Australian Hearing audiologists when visiting DECS schools and early childhood services in the region once a term. In the country, DECS hearing impairment coordinators also visit early childhood services as well as schools.

Ceduna–Koonibba Aboriginal Health Service also provides whole-body checks for Aboriginal children at Koonibba Aboriginal School, Ceduna Area School and Crossways Lutheran School annually. The hearing health worker conducts the ear health and hearing screening. The hearing health worker also assists the Children, Youth and Women's Health Service nurse (based at Streaky Bay) with developmental checks for Aboriginal children in care settings such as at Minya Bunhii Child Care Centre in Ceduna and Koonibba Child Care Centre. Data from the developmental health checks are used by both organisations.

Twice a year, Children, Youth and Women's Health Service provides pre-school entry screening for children aged four to five years at Ceduna Preschool. Ceduna–Koonibba Aboriginal Health Service is not involved in this screening.

Ceduna–Koonibba Aboriginal Health Service has signed a memorandum of understanding to be involved in the Otitis Media Clinical Support Systems Project administered by the Northern and Far Western Regional Health Service (see Port Augusta case study).

Ceduna has monthly visits from an ear, nose and throat specialist, through a private practice, at Ceduna Family Medical Practice.

Whyalla Hospital and Health Service provides early childhood speech pathology services to the region. These are used by Koonibba Child Care Centre, Minya Bunhii Child Care Centre, Koonibba Aboriginal Child Parent Centre and Ceduna Preschool for Aboriginal children aged under four.

Education programs
All state schools and preschools in the Ceduna–Koonibba area can access support from the DECS Eyre district Student Support and Disability team at Port Lincoln. Services supporting children and students who are deaf or hearing impaired, include support for Aboriginal children and students affected by conductive hearing loss as a result of otitis media. Support includes classroom strategies, advice on acoustics, learning strategies and training and development. Catholic and Independent schools also receive support from their sector and also develop relationships with other service providers to assist students with disabilities, including those with hearing loss.

Some education and care sites have implemented initiatives that directly or indirectly assist Aboriginal children and students with otitis media and conductive hearing loss. However, no site visited had implemented a targeted in-house support program.

Health initiatives

- Early childhood services
  Children at Minya Bunhii and Koonibba childcare centres receive developmental health checks biannually from Children, Youth and Women's Health Service. The Children, Youth and Women's Health Service nurse or the hearing health worker refers children on to other services or intervention when necessary.

  Koonibba Child Care Centre advises families about the visiting ear, nose and throat specialist and the visiting paediatrician from Port Augusta Health Service.

  Koonibba Child Care Centre and Koonibba Aboriginal School's Child Parent Centre and junior primary classes run the Breathe, Blow and Cough (BBC) Program, teaching children how to blow their noses and clear the Eustachian tube. Koonibba Child Care Centre and Minya Bunhii Child Care Centre provide ear cleansing for children with runny ears.

- Preschools
  Ceduna Preschool's four to five-year-olds are screened by Children, Youth and Women's Health Service as part of the pre-school entry screening.

- Schools
  Koonibba Aboriginal School, Ceduna Area School and Crossways Lutheran School access Ceduna–Koonibba Aboriginal Health Service's annual whole body screening for Aboriginal students, which includes ear and hearing screening.

  Crossways Lutheran School accesses Ceduna–Koonibba Aboriginal Health Service's targeted ear health and hearing program three times a year and visits are organised at the start of each year.

Education initiatives

- Early Childhood Services
  The Ceduna Early Learning Program (DECS) is a home-based program, which provides support to parents of children from birth to four and includes support with language and literacy.

  Childcare centres and the child parent centre access Whyalla Hospital and Health Service speech pathology services.

- Preschools
  The preschool uses Whyalla Hospital and Health Service speech pathology services for three-year-olds and the DECS Eyre district speech pathologist and disability coordinator for four-year-olds. It is estimated that 20 per cent of children enrolled at Ceduna Preschool have speech and/or language problems. Ceduna Preschool uses Letterland as a literacy tool and has a literacy teacher for Aboriginal three-year-olds as part of the South Australian Early Years Literacy Program.

- Schools

  Literacy and numeracy are priorities at Koonibba Aboriginal School and the school receives Commonwealth Literacy Program funding. DECS Aboriginal Education Unit also supports programs for students. The school trialled sound amplification systems but did not continue with them. Home visiting is a fundamental part of the school's program.

  Ceduna Area School's new classrooms all have sound field amplification and were designed for noise reduction. Students at risk, including those with hearing impairment, have access to a special class, which receives support in school services officers' hours. Ceduna Area School staff has had professional development regarding hearing loss and language development and will receive further training when sound fields are installed. The local hearing impairment coordinator based at Port Lincoln visits once a term and provides staff with classroom and teaching strategies for students with hearing loss.

  Ceduna–Koonibba Aboriginal Health Service provides community education on ear and hearing health to schools. Crossways Lutheran School uses this service because it has a significant Aboriginal enrolment. In fact, 70 per cent of its enrolment is indigenous compared to 16 per cent at the local area school. Crossways also employs learning support staff for students with additional needs and has developed a resource room for students and staff. Students with hearing impairment can access two mobile sound field amplification systems, which can be installed in any classroom as needed.

Model

Ceduna–Koonibba Aboriginal Health Service's ear health and hearing program follows the National Aboriginal and Torres Strait Islander Hearing Strategy (a national hearing strategy). Equipment and staff training were provided by Australian Hearing which continues to have a support role. The service also implements the Clinical Care Guidelines for the Management of Otitis Media in Aboriginal and Torres Strait Islander populations, which were developed as part of the strategic research component of the national strategy. Models and pathways contained in the Otitis Media Clinical Support Systems Project, with its aim to reduce otitis media in Aboriginal children and prevent chronic suppurative otitis media, will also guide program delivery for children with otitis media and conductive hearing loss.

The two childcare centres do not have programs of their own but are recipients of programs from Ceduna–Koonibba Aboriginal Health Service; Children, Youth and Women's Health Service; and Whyalla Hospital and Health Service.

The preschool and schools all have a process for assisting children with poor ear health or suspected hearing loss. This is usually imbedded in the preschool's and schools' process for supporting children with additional needs including hearing loss. Crossways Lutheran School was the only school systematically using Ceduna–Koonibba Aboriginal Health Service's ear health and hearing program.

The local hearing impairment coordinator performs the role in line with the DECS job and person specification and district needs.

Issues of concern

Health services

The hearing health worker was concerned that she needed more time with the visiting Australian Hearing audiologist. A lack of awareness of otitis media and hearing loss by people in education sites resulted in low take-up of outreach services. Obtaining parental consent for application of the ear health and hearing program was problematic. The worker acknowledged that screening days could be cancelled due to more urgent medical issues at the clinics.

Early childhood services

The Early Learning Program coordinator raised concerns regarding otitis media and assisting children with hearing loss. Parents and education staff seem not to understand the impact of otitis media and conductive hearing loss on children's development. Parents are accepting of poor ear health, possibly because they are frustrated with medical services and perceive children's health services, particularly screenings, to be not as regular as in the past. The new administration-of-medicine guidelines for childcare centres were seen by parents as too regulated. The coordinator was particularly concerned about the effects of hearing loss on individual children.

The director at Koonibba Child Care Centre was particularly concerned about early childhood services bearing the brunt of caring for young children's health. This was compounded by families' acceptance of poor ear health, often because the parents also had suffered poor ear health. Families require timely access to health services, including specialists, and often the time between referrals and appointments is too long or transport is not available to reach services in Ceduna. Another problem was the lack of space and inappropriate surroundings in the childcare centre for ear health and hearing screening.

The director of Minya Bunhii Child Care Centre's main concern was the lack of awareness amongst parents of Aboriginal children with hearing loss and also among school staff once children commence school. Parents do not pick up their children's hearing loss and teachers were unaware of the impact of hearing loss on students' learning and how to address it. The director would like more early-intervention visits from Ceduna–Koonibba Aboriginal Health Service.

Preschools

Staff members of Ceduna Preschool were concerned with lack of follow-up for children identified with poor ear and hearing health. They were also concerned about the transition process for speech pathology services. Aboriginal children are eligible to attend preschool from age three and so receive community health speech pathology services. Once children turn four, they are provided with speech pathology from the DECS speech pathologist, a consultative service.

Schools

Koonibba Aboriginal School staff said that screening services provided onsite by the Aboriginal health service were not as regular as before, and children had to travel to Ceduna for services. The school students received only annual whole-body-check screening and the principal believed this contributed to insufficient follow-up of students with poor ear and hearing health.

Ceduna Area School staff acknowledged that fluctuating hearing loss is difficult to work with and not helped by the noisy open-plan classrooms. Renovations, sound field amplification and staff training would address this issue. The deputy principal at the school stated that they relied on the hearing impairment coordinator's three-day visits each term to give students and staff information and help. It was reported that there had been a reduction in support provided by the Eyre district hearing impairment coordinator based in Port Lincoln.

Evidence of collaboration
Ceduna–Koonibba Aboriginal Health Service; Australian Hearing; Children, Youth and Women's Health Service; and Whyalla Hospital and Health Service provide a combination of hearing-related health services for children and students at childcare centres, preschools and schools.

The dominant service provider is Ceduna–Koonibba Aboriginal Health Service and its strongest partner is Australian Hearing. This collaboration was fostered by the national hearing strategy, and Ceduna–Koonibba Aboriginal Health Service has an ongoing relationship with the Office of Aboriginal and Torres Strait Islander Health which funds the Hearing Health Program. The Aboriginal health service also works with Children, Youth and Women's Health Service.

Ceduna–Koonibba Aboriginal Health Service's role in the provision of hearing health care will strengthen after agreeing to join the Otitis Media Clinical Support Systems Project administered by the Northern and Far Western Regional Health Service, South Australian Department of Health.

The Early Learning Program, Minya Bunhii Child Care Centre, Ceduna Preschool and Ceduna Area School are co-located and work closely together, particularly the early childhood services and the preschool. All education site staff members feel that they have strong relationships with parents. Koonibba Aboriginal School has active home visiting. The DECS preschool and schools access services from the DECS Eyre district office in Port Lincoln, including services for speech pathology, special education and hearing impairment. The hearing impairment coordinator works with the Aboriginal health service, Australian Hearing and Children, Youth and Women's Health Service. Crossways Lutheran School has a good relationship with the Association of Independent Schools, particularly for capital grant funding.

Awareness raising
Community education is an important element of Ceduna–Koonibba Aboriginal Health Service's Hearing Health Program. Early childhood services and state schools agree that raising community awareness of otitis media and conductive hearing loss and its impact on children's development is Aboriginal Health Service's role. Education staff offered many suggestions on how the Aboriginal Health Service could improve parents' access to community education, including:

- home visiting with visual resources
- an annual health expo
- a joint information campaign by health and education workers
- community groups distributing and discussing relevant hearing health information.

Teacher education or whole-school awareness of otitis media and hearing loss was endorsed. One school considered including ear and hearing health information as part of new teachers' induction. Specific information for children and students was important and could be achieved though television advertising similar to that on the Northern Territory's Imparja channel.

Summary

Strengths of current service provision	Areas identified by participants for strengthening
• Aboriginal health services and outreach program • Access to hearing impairment services for state preschool and schools • Access to tertiary hearing services and visiting specialists • Changes to acoustic environment including sound amplification systems or individual FM units in local preschools and schools • Collaboration across health services • Community awareness and education • Early intervention focus on target population aged birth to eight • Focus on primary health care, prevention and health promotion by health service • Health initiatives in care and early childhood settings • Holistic approach to child health • Home visiting • Identification of ear disease and hearing loss in Aboriginal children • Partnership with parents, and family empowerment • Programs supported by national policy framework and evidence-based practice and protocols • Specific project to reduce chronic suppurative otitis media in Aboriginal children in the region	• Greater support for Aboriginal health care workers by tertiary hearing services • Renew focus of hearing health programs on Aboriginal infants and young children • Home visiting • Improved access to specialist intervention and care for Aboriginal children • Increase understanding of families, care personnel and educators, including newly graduated teachers, of otitis media and conductive hearing loss and its impact on Aboriginal children • Better information for families and staff to recognise and identify otitis media and conductive hearing loss • Key community people to assist with community awareness • More effective collaborative practice between local health service, early childhood site staff and families • Stronger collaboration between health and education at the local level • Support Aboriginal health care workers to undertake community awareness and education • Support model for Aboriginal students with conductive hearing loss but no audiological evidence • Training and retention of qualified health workers

Murray Bridge

The case study investigated programs or initiatives to address otitis media and conductive hearing loss for Aboriginal children and students in the Murray Bridge area. Community models, issues of concern, collaboration and community awareness were discussed. A summary of the interviews with health and education organisations and individuals is presented below. The full Murray Bridge case study is recorded in Volume 2.

Programs
Programs and initiatives addressing otitis media and/or conductive hearing loss are provided by:

- Children and Families Team, Murray–Mallee Community Health Service
- Children, Youth and Women's Health Service
- Department of Education and Children's Services (DECS) district's hearing impairment coordinator.

Health programs
Murray Bridge does not have an Aboriginal health service. However, the local community health service (Murray–Mallee Community Health Service) has an Aboriginal health team.

Murray–Mallee Community Health Service's Children and Families Team (formerly Early Intervention Program) offers periodic middle ear screening to its Nunga playgroup families. This aims to increase parents' awareness of middle-ear disease and assist parents' access to medical or hearing services for children. The speech pathologist conducts only tympanometry to test the condition and mobility of the eardrum. If the child's middle ear is not functioning, the family is given Children, Youth and Women's Health Service's 1300 number to make an appointment for a test with the service's Hearing Assessment Service. If children present with infection of the middle ear, the speech pathologist advises parents to contact their local doctor.

Families can access the Children, Youth and Women's Health Service Hearing Assessment Service in Adelaide, but usually opt to wait until the service visits Murray Bridge every quarter. A Nunga worker from the Murray–Mallee Community Health Service usually accompanies families to appointments. Children identified with a hearing loss are eligible for speech pathology services provided by the Murray–Mallee Community Health Service's Children and Families Team. The team is extending this initiative to the Aboriginal crèche. Families interviewed at the team's Nunga playgroup were all familiar with ear health and hearing screening provided at playgroup sessions.

Children, Youth and Women's Health Service assesses the hearing of children from birth to twelve years through statewide programs such as newborn hearing screening and developmental health checks. These focus on the detection of permanent hearing loss, but programs also detect middle-ear disease and conductive hearing loss. Developmental health checks are available for children up to age six, of which the pre-school entry screening for children aged four-and-a-half to five is the most established. All four kindergartens/preschools in Murray Bridge access the program, but children's participation is voluntary and parents need to sign a consent form. Kindergarten staff members liaise actively with families regarding participation and consent. If space is available, pre-school entry screening is conducted mostly at the preschool by the Children, Youth and Women's Health Service nurse.

All other developmental checks are conducted from Children, Youth and Women's Health Service's West Terrace premises. At Murray Bridge South Kindergarten, which has a significant Aboriginal enrolment, staff members ask the nurse to check younger children if they have concerns.

Children with a hearing problem detected at developmental health checks are referred by the nurse to Children, Youth and Women's Health Service's statewide Hearing Assessment Service, which regularly services Murray Bridge. Children, Youth and Women's Health Service's paediatric audiologist visits every three months and conducts testing at Children, Youth and Women's Health Service's office and travels to communities around Murray Bridge if required.

The Children, Youth and Women's Health Service nurse, who conducts pre-school entry screenings, stated that she occasionally screens primary school children, but "they are usually from isolated areas where parents don't have easy access to other facilities". The DECS hearing impairment coordinator advises preschools and schools to contact Children, Youth and Women's Health Service for children about whom there is concern so that they can be screened and, if necessary, referred to the Hearing Assessment Service to verify hearing loss by an audiogram.

The DECS hearing impairment coordinator said: "Children, Youth and Women's Health Service's outreach service is necessary, as there are many Aboriginal families who are in outlying communities that do not have access to these services".

Murray Bridge Christian College and St Joseph's School do not refer primary schoolchildren to Children, Youth and Women's Health Service for screening or hearing assessment, although Murray Bridge Christian College preschool accesses the pre-entry screening. St Joseph's School advises parents to contact their local doctor or Australian Hearing in Murray Bridge for hearing tests. Children, Youth and Women's Health Service's Indigenous cultural consultant commented that "the community knows they can get children's hearing checked at Children, Youth and Women's Health Service or through the local doctor".

Education programs

All state schools and preschools in the area can access support from the DECS Hills–Murraylands district Student Support and Disability team at Murray Bridge. Services include support for Deaf and hearing-impaired children including Aboriginal children and students with conductive hearing loss as a result of otitis media. Classroom strategies, advice on acoustics, learning strategies and training and development are given. Catholic and Independent schools also receive support from their sectors but also develop local relationships to assist students with disabilities, including those with hearing loss.

An audiogram and referral from a state preschool or school is required for the provision of DECS district support services to children and students, but obtaining an audiogram, particularly for Aboriginal children and students, is often problematic.

The number of referrals from preschools and schools to the DECS Student Support and Disability team in Murray Bridge of children and students with suspected hearing loss, but no audiogram, is of great concern to district staff. Many children miss out on support because they do not have the audiogram and, in some cases, are unlikely to ever obtain one.

In response, the local DECS hearing impairment coordinator developed a "Referral of child/student with possible conductive hearing loss pathway". Speech perception testing kits were also introduced giving hearing impairment coordinators the opportunity to provide preliminary testing of children's and students' hearing.

Some education and care sites implemented initiatives that directly or indirectly assisted Aboriginal children and students with otitis media and conductive hearing loss but no site visited had implemented a targeted in-house support program.

Health initiatives

- Early Childhood Services
  The Breathe, Blow and Cough (BBC) Program is used regularly by Murray Bridge South Kindergarten to teach children how to blow their noses and clear the Eustachian tube.

Education initiatives

- Early Childhood Services
  The DECS Learning Together program aims to improve early literacy learning for children from birth to age three in the context of their families.

- Preschools
  Murray Bridge South Kindergarten regularly uses DECS speech pathology services for a significant cohort of its children. Aboriginal children can start kindergarten from age three and are included in this service. In 2005, the kindergarten was funded for a literacy teacher as part of the DECS Early Years Literacy Program. Sound field amplification is installed in part of the kindergarten, but is not used currently.

  Murray Bridge Christian College preschool receives speech pathology from Murray–Mallee Community Health's Children and Families Team for identified Aboriginal children up to age six. The health service usually provides speech pathology for children up to age four.

- Schools
  Fraser Park Primary School delivers a small-group literacy program for six to eight students that has been embedded in the Health Promoting School Policy in the past. This school also has a speech program for identified students, with school services officers implementing the program in collaboration with the department's speech pathologist. The school does not have sound field amplification systems installed in classrooms.

  St Joseph's School has an in-house speech program designed by staff from existing programs and resources and also uses a private speech pathologist based in Murray Bridge.

Model
Children, Youth and Women's Health Service has a model of health delivery to infants, children and young people in South Australia, and hearing services are part of this statewide model.

The DECS hearing impairment coordinator is part of the district Student Support and Disability team. She performs her role according to a departmental job and person specification and district needs. The process of referral of children and students to the district hearing impairment coordinator is generic. In response to the high concentration of young Aboriginal people in Murray Bridge and the high prevalence of otitis media and conductive hearing loss, a "Referral of child/student with possible conductive hearing loss pathway" was developed, as many children with suspected hearing loss had been unable to obtain the necessary audiological evidence and, therefore, were missing out on support.

Both the Independent and Catholic schools have a process to help students with additional needs, which also assists children with suspected or verified hearing loss.

Issues of concern
Families
Many families felt that medical personnel did not explain information clearly and often displayed prejudice. One person said that "families are very aware of the problems around otitis media and hearing loss, but not the solutions". Many families do not go to the doctor until experiencing a crisis. Families perceived that screening was not as regular as before.

Families believed that there was a lot of help for children with hearing loss in the early childhood years, but that it declined once children started school. They also commented that schools did not understand Indigenous ways of learning.

Health services (Indigenous cultural consultant)
The Indigenous cultural consultant commented that Children, Youth and Women's Health Service lacked adequate health promotion resources on ear and hearing health targeting Aboriginal families, and she relied on interstate resources. Aboriginal families were aware of the ear health issues, but not the educational impact of otitis media and conductive hearing loss.

District hearing impairment coordinator
A major concern for the DECS hearing impairment coordinator is that preschools and schools refer children and students with suspected hearing loss without audiological evidence, and some children never obtain an audiogram and the support they need.

Early Childhood Services
The major concern for the DECS Learning Together Program is the small representation of Aboriginal families in the program.

Preschools
The biggest concerns for the kindergarten director were the limited access to district preschool support services for three-year-old Aboriginal children and that kindergartens with significant Aboriginal enrolments have to balance providing a learning environment and a location for the delivery of health services.

Schools
The three schools (state, Catholic and Independent) which participated in this case study had similar concerns. Staff members were all concerned about students masking hearing loss—many tried to hide an inability to hear behind inappropriate behaviour. One principal said that Aboriginal families were accepting of recurring otitis media as a common illness. This problem was compounded by families not always following up on medical appointments or hearing tests, mostly due to not knowing where to access help.

Fraser Park Primary School experiences high student transience and regular staff turnover. Student transience impacts on the implementation of individual programs to assist students with additional needs and individual learning. Staff turnover impacts on staff awareness of:
- otitis media and hearing loss and its impact on learning
- strategies to assist students with hearing loss to access the curriculum.

Obtaining student information from parents upon enrolment or transition can be problematic and this affects identifying and developing programs for children with additional needs, including hearing loss.

The Catholic and Independent schools were concerned with their capacity to provide services for students with additional needs, particularly as each school has a population from a low socioeconomic background. This situation was often exacerbated by the fact that children over the age of six become no longer eligible for community speech pathology services.

Evidence of collaboration
Collaboration between organisations ranged from relationships between individual personnel to organisations working in partnership for the same group of children and students. Murray–Mallee Community Health Service Children and Families Team has a relationship with Children, Youth and Women's Health Service through the Indigenous cultural consultant, who visits families at the Nunga playgroup. However, the Children and Families Team expressed concern that children were not readily referred from Children, Youth and Women's Health Service to the community health service. Families, in particular Aboriginal families, are often unknown to the community health service until a child is identified with a disability. Assessment and intervention could start earlier if the Children and Families Team knew earlier of children who may be at risk.

The Nunga playgroup is part of the community health service's commitment to engage with Aboriginal families and to link them to services.

Murray Bridge Christian College preschool accesses the Children and Families Team services and has negotiated speech pathology services for identified Aboriginal children up to age six.

There is collaboration between Children, Youth and Women's Health Service, the DECS district office and DECS sites. The Children, Youth and Women's Health Service nurse visits both DECS kindergartens for pre-school entry screening. The DECS hearing impairment coordinator advises preschools and schools to refer a child with suspected hearing loss to Children, Youth and Women's Health Service for initial screening and further referral to the Hearing Assessment Service for testing and an audiogram.

Murray Bridge Christian College accesses the pre-school entry screening service by Children, Youth and Women's Health Service for the college's preschool population. St Joseph's School, which has no preschool, refers students to the Children's Assessment Team at Flinders Medical Centre. However, for students with suspected hearing loss, the school advises parents to contact Australian Hearing, which visits Murray Bridge regularly, for a hearing test.

The Murray Bridge South Kindergarten and Fraser Park Primary School regularly access DECS speech pathologists and the hearing impairment coordinator. Murray Bridge Christian College accesses support from the Association of Independent Schools for special needs training and professional development, and St Joseph's Catholic School accesses help from the Indigenous Education Team and the Special Education Team at the Catholic Education Office.

Children, Youth and Women's Health Service's Indigenous cultural consultant, the DECS hearing impairment coordinator, the DECS Learning Together Program, Murray Bridge South Kindergarten and Fraser Park Primary School all said they had strong personal and working relationships with Aboriginal families and the community, particularly through home visiting.

Awareness raising

Building relationships with families and working with Aboriginal staff were the most cited examples of raising community awareness. The Indigenous cultural consultant explained how information and raising awareness among the Aboriginal community could be achieved in a culturally appropriate manner. This is discussed in the full Murray Bridge case study in Volume 2. Training and development for educators and preschool information sessions for parents were also commonly suggested.

Summary

Strengths of current service provision	Areas identified by participants for strengthening
• Access to hearing impairment services for state preschools and schools • Access to secondary and tertiary hearing services • Child and maternal health a focus of the local community health services' Aboriginal health team • Committed program personnel • DECS pathway for students with suspected conductive hearing loss and no audiological evidence • Effective collaboration across health services and between health and education services • Focus on primary health care, prevention and health promotion by health service • Health initiatives in care and early childhood settings • Partnership with parents, and health promotion through playgroup	• "One-stop shop" model supported by families • Effective communication between Aboriginal families and local doctors • Effective enrolment procedures critical to early intervention for students in Catholic and Independent schools • Home visiting • Increase knowledge of and access to ear screening and hearing testing services • Increase understanding of families, care personnel and educators, including newly graduated teachers, of otitis media and conductive hearing loss and its impact on Aboriginal children • Information for families and staff to recognise and identify otitis media and conductive hearing loss • Information provision to families that support cultural forms of communication • Key community people to assist with community awareness • More effective collaborative practice between local health service, early childhood site staff and families • Support for take-up of sound amplification systems • Long waiting lists for appointments at Children, Youth and Women's Health Service's Hearing Assessment Program • Training and development for teachers to understand the correlation between hearing loss and behaviour • Training and development to increase awareness and early intervention at preschools • Whole-of-school response to conductive hearing loss for schools with significant Aboriginal enrolments

Northern suburbs of Adelaide

The case study investigated programs and initiatives to address otitis media and conductive hearing loss for Aboriginal children and students in Adelaide's northern suburbs, particularly Elizabeth. Community models, issues of concern, collaboration and community awareness were discussed. A summary of interviews with personnel from health and education organisations and families is presented below. The full northern suburbs of Adelaide case study is in Volume 2.

Programs
Programs or initiatives that address, or have addressed, otitis media and/or conductive hearing loss are provided by:

- Muna Paiendi Community Health Centre
- Nunkuwarrin Yunti of SA Inc
- Children, Youth and Women's Health Service
- Australian Hearing
- Department of Education and Children's Services (DECS) district hearing impairment coordinators
- Kaurna Plains Early Childhood Centre.

Health programs
The northern suburbs of Adelaide are serviced by two Aboriginal health services: Nunkuwarrin Yunti of South Australia Inc and Muna Paiendi Community Health Centre. During this study (late 2005), there was little evidence of primary health care services in Adelaide's northern suburbs implementing any comprehensive programs or initiatives to address otitis media and/or conductive hearing loss for Aboriginal children and students in this area.

In the past, there has been a local and metropolitan-wide program implemented by Children, Youth and Women's Health Service in collaboration with Nunkuwarrin Yunti to improve health outcomes for Aboriginal children. Past programs have been preventative health programs based on regular health checks that included ear and hearing screening. The health check program also included a referral process for medical management of ear disease, audiological testing and management and speech and language assessment.

A specific program to address otitis media and conductive hearing loss and improve health and education outcomes for Aboriginal preschool children was developed at Kaurna Plains Early Childhood Centre in 1998. The program was known as the Ear Health Program, later changing its name to the Child Health Program. It evolved from the long established Well Baby clinic provided by Children, Youth and Women's Health Service and Nunkuwarrin Yunti at the centre.

The program was initiated by Kaurna Plains Early Childhood Service and developed in partnership with Children, Youth and Women's Health Service, Nunkuwarrin Yunti, Australian Hearing and DECS. Children, Youth and Women's Health Service was the lead agency that coordinated the program and provided the initial screening, including audiometry, tympanometry, otoscopy and the Kendall Toy Test for speech discrimination. The program developed an appropriate referral process with medical management and speech and language assessment provided by Nunkuwarrin Yunti and audiological testing and management provided by Australian Hearing. Screening, testing and management of ear and hearing issues occurred onsite at the centre's medical rooms, purposely built when the centre was renovated in 1998.

The program still operates but service levels have changed due to a change in organisational focus of both Children, Youth and Women's Health Service and Nunkuwarrin Yunti. Children, Youth and Women's Health Service, Nunkuwarrin Yunti and Australian Hearing continue to provide services to Kaurna Plains Early Childhood Centre. Children, Youth and Women's Health Service continue to provide health checks, and a paediatric registrar from Flinders Medical Centre, who visits the centre for Nunkuwarrin Yunti, provides clinical services by appointment.

Both services are provided fortnightly instead of weekly. Australian Hearing continues to provide regular hearing testing and review of children identified with ear and hearing problems. Students attending Kaurna Plains School are also eligible for testing by Australian Hearing. The local DECS hearing impairment coordinators have been using the services of Australian Hearing for children referred to hearing impairment services from Kaurna Plains School.

In 1998, Nunkuwarrin Yunti, with Children, Youth and Women's Health Service, commenced the Aboriginal Child Health Surveillance Program, which provided health checks for all Aboriginal school students in metropolitan Adelaide. The program later became known as the Metropolitan School Health Surveillance Program. At schools with high Aboriginal enrolments, all students in reception, year 1 and year 6 received a full screening including blood pressure, height, weight, eye, renal, ear and hearing checks.

The program had strong links with the Women's and Children's Hospital for renal care, and Australian Hearing for follow-up of children identified with hearing difficulties. Children with ear disease or speech and language issues were medically managed and/or assessed by Nunkuwarrin Yunti. The program ceased in 2003.

Muna Paiendi Community Health Centre recently trialled a pilot program of health checks for Aboriginal schoolchildren at Kaurna Plains School. Muna Paiendi's speech pathologist provided the ear and health screening component with portable equipment owned by Muna Paiendi. This was to:

- respond to requests for school screenings
- gather evidence on health issues affecting northern suburbs Aboriginal children
- develop strategies for their prevalent health issues.

The Muna Paiendi team is aware that otitis media and conductive hearing loss is a major health issue for Aboriginal children. Muna Paiendi's speech pathologist conducts hearing checks, if required, for children referred for speech and language assessments. The speech pathologist regularly visits the DECS Learning Together Program's Nunga playgroup at Para West Adult Campus to monitor children at risk of speech and language problems.

As part of the Aboriginal Primary Health Care Access Program, Nunkuwarrin Yunti's Brady Street clinic and Muna Paiendi Community Health Centre have discussed streamlining services for clients using both centres. Muna Paiendi would provide the ear and hearing component of Brady Street clinic's full screening for all clients. Brady Street would provide medical management and refer clients with ear disease and suspected hearing loss to specialist services.

Education programs

Of the care and education sites visited, Kaurna Plains Early Childhood Centre was the only site with a targeted support program to address otitis media and conductive hearing loss. It was a response to staff concerns about the high prevalence of otitis media, particularly chronic suppurative otitis media (runny ear), among childcare and preschool children and its effect on early learning. The aim of the Ear Health Program (later Child Health Program) was to promote early learning and numeracy skills but, given that the program adopted a medical model, the emphasis shifted from an early learning to a health focus.

All northern suburbs state schools and preschools can access support from the DECS Kumangka Para and Salisbury district Student Support and Disability teams based at Elizabeth. Services include support for deaf and hearing-impaired children and students, including those affected by conductive hearing loss as a result of otitis media. Support includes classroom strategies, advice on acoustics, learning strategies and training and development. Catholic and Independent schools are also supported by their sectors but develop their own local relationships to assist students with disabilities, including those with hearing loss.

Some education and care sites implemented initiatives that directly or indirectly assisted Aboriginal children and students with otitis media and conductive hearing loss. However, no site visited had implemented a targeted in-house support program.

Health initiatives

- The Breathe, Blow, Cough (BBC) program is used at Kaurna Plains Early Childhood Centre, but only on an ad hoc basis.

- Kaurna Plains Early Childhood Centre has a play table with headphones to accustom children to headphones used in testing by Australian Hearing.

- Tyndale Christian School's Special Education Coordinator has a network of local health professionals to assist families with testing and support services, including audiologists.

Education initiatives

- Early Childhood Services
  The DECS Early Learning Program at Para West Adult Campus aims to improve early literacy learning for children from birth to age three in the context of their families. The DECS Early Learning Program's Nunga playgroup is supported by the young mothers' group worker and the speech pathologist from Muna Paiendi Community Health Centre.

- Preschools
  Kaurna Plains Early Childhood Centre has carpeted floors and felt-covered walls to improve acoustics. Visual displays on pinboards assist children with conductive hearing loss.

- Schools
  Davoren Park School implements classroom strategies, provided by the district hearing impairment coordinator, for students with hearing loss. These strategies include placing students in the front row, ensuring eye contact when communicating with them, and using visual aids to support learning.

  Davoren Park School has implemented a much-lauded literacy skills development program for junior primary students. This is based on research into best practice for oral and language development. More information is contained in the DECS publication: *Making changes: Stories about improving literacy and numeracy outcomes for learners* written by South Australian educators.

  The school installed one sound field amplification system in 2003 after it had trialled a system provided by the DECS Special Education Resource Unit. The system was destroyed by fire in 2005 and at the time of writing had not been replaced.

  Kaurna Plains School has a strong focus on literacy and numeracy to assist Aboriginal students to reach levels of literacy and numeracy comparable to other Australian students.

  St Mary Magdalene School did not advise of any specific strategies for students identified with hearing loss, but it accommodated Catholic Education Office's speech and language assessment clinic for two terms in late 2006.

  Tyndale Christian School has a speech therapist visiting fortnightly to provide a fee-paying speech and language service for families. The school has tagging on its enrolment software to give teachers information on students' additional needs.

Model

Health checks programs provided solely by Children, Youth and Women's Health Service or in partnership with Nunkuwarrin Yunti of South Australia Inc for Aboriginal children are based on Children, Youth and Women's Health Service's statewide model of developmental health checks for children from birth to twelve years old in South Australia.

Children, Youth and Women's Health Service was the leading agency for the Metropolitan Child Health Surveillance Program and Kaurna Plains Early Childhood Centre's Child Health Program and provided the initial screening and coordinated referrals. The referrals were for medical management by Nunkuwarrin Yunti and audiological management by Australian Hearing.

The school health checks for Aboriginal students, piloted at Kaurna Plains School by Muna Paiendi Community Health Centre, are based on a primary health care model that targets prevention, early detection and management. Health checks provided by Muna Paiendi are based on standard health checks for children that are used by other primary health organisations such as Children, Youth and Women's Health Service.

Complementary clinical services and resource sharing by Muna Paiendi Community Health Centre and Brady Street clinic (Nunkuwarrin Yunti) is part of the Aboriginal Primary Health Care Access Program in the northern region. This is a health partnership to improve primary health care for Aboriginal and Torres Strait Islander people (from <www.nunku.org.au> accessed 04/09/06). The Aboriginal Primary Health Care Access Program was established in the northern region in 2003 with Nunkuwarrin Yunti, Muna Paiendi Community Health Centre and Aboriginal Sobriety Group as partners. Nunkuwarrin Yunti is overall manager and a key partner in developing and providing services across the Adelaide metropolitan region.

Evidence of collaboration

Children, Youth and Women's Health Service and Nunkuwarrin Yunti have a long relationship in health care for northern suburbs' Aboriginal families. The Metropolitan Child Health Surveillance Program, delivered at metropolitan schools with Aboriginal enrolments for over five years, extended the collaborative relationship to include DECS. This program also established strong links with Australian Hearing for the referral to audiological services of children with suspected hearing loss.

Kaurna Plains Early Childhood Centre's Child Health Program is a collaboration initiated and developed by centre staff and management and personnel from Children, Youth and Women's Health Service, Nunkuwarrin Yunti and DECS. Australian Hearing's commitment to regular onsite review and testing for children with hearing problems established it as a key partner.

Children, Youth and Women's Health Service and Nunkuwarrin Yunti do not work as closely as before, but there is an ongoing relationship between Nunkuwarrin Yunti and Australian Hearing. Nunkuwarrin Yunti has been planning monthly hearing screenings by Australian Hearing at its Wakefield Street practice. This has been delayed due to the lack of a soundproof room for testing.

Children, Youth and Women's Health Service has become associated more closely with Nunkuwarrin Yunti's Aboriginal Primary Health Care Access Program partner, Muna Paiendi Community Health Centre, which delivers services with a child and maternal focus.

The first Aboriginal primary health care program in metropolitan Adelaide was established in the northern region in 2003. This collaborative approach to health service delivery by Nunkuwarrin Yunti, Muna Paiendi Community Health Centre and the Aboriginal Sobriety Group operates well.

Issues of concern

Families

The main concern for Nunga playgroup families was access to information on otitis media and conductive hearing loss. There was little knowledge of ear and screening services, except for services provided by the Child Health Program at Kaurna Plains Early Childhood Centre.

Obtaining feedback from testing, such as the newborn hearing screening, was a concern. Some families were aware of the impact of ear disease and hearing loss on learning and education, but others had very little knowledge, although many had family members who had ear and hearing problems during childhood.

Health services
Staff members at Nunkuwarrin Yunti's Brady Street clinic, Muna Paiendi Community Health Centre and Children, Youth and Women's Health Service were concerned about access to specialist ear, nose and throat intervention for children with ear disease and hearing loss. According to the general practitioner at Brady Street clinic, the long wait for assessment of the need for surgery was a major issue, compounded by the long wait for surgery.

The Children, Youth and Women's Health Service nurse, who has provided ear and hearing screening at Kaurna Plains Childhood Centre for many years, discussed the complexity of the referral process. Australian Hearing was unable to refer Aboriginal children direct to ear, nose and throat specialists. This had to be done by a general practitioner. Long waiting lists often result in children exiting the system without obtaining the necessary intervention. Local ear, nose and throat services are difficult to obtain as the Lyell McEwin Health Service in Elizabeth no longer accepted ear, nose and throat referrals. All clients are referred to the Women's and Children's Hospital in North Adelaide.

The team leader at Muna Paiendi Community Health Centre and the general practitioner from Brady Street clinic discussed the importance of skilled Aboriginal health workers for intervention and take up of health services by Aboriginal people. Muna Paiendi's team leader was concerned about a lack of Aboriginal health workers/nurses to meet the demand for culturally-appropriate care.

DECS district hearing impairment services
The DECS Kumangka Para district's two hearing impairment coordinators expressed different concerns.

One of the coordinators was concerned by the limited knowledge of families of newly referred children about the impact of otitis media and conductive hearing loss on literacy and learning. This was not helped by long waiting lists for hearing testing by Children, Youth and Women's Health Service Hearing Assessment Service, often resulting in families not pursuing appointments.

The coordinator also was concerned about school acoustics, supported sound field amplification and self-contained classrooms to help students with hearing loss.

The second coordinator was concerned about the limited awareness among many preschool staff of otitis media and conductive hearing loss. Early intervention at preschool could lessen many problems at school for children with otitis media and conductive hearing loss.

Early Childhood Services
No concerns were discussed by staff of the DECS Learning Together Program's Nunga playgroup.

Preschools
The former director of Kaurna Plains Early Childhood Centre was concerned that the Children, Youth and Women's Health Service nurse visits had changed from weekly to fortnightly. The service was considered vital to families and many had accessed the regular service.

Schools
Davoren Park Primary's concern with students' literacy has been addressed by the Literacy Development Program. However, two problems are evident at Davoren Park: about 20 per cent of students have additional needs, and transience affected some students' progress and programs to assist them. The school did receive health checks for Aboriginal students under the former Metropolitan Child Health Surveillance Scheme. The school would welcome health checks for all students and would support families to follow up issues identified by them.

St Mary Magdalene School principal in Elizabeth Vale was concerned with the number of students experiencing speech and language difficulties and the limited support available for northern suburb students. Since the interview, Catholic Education Office has enhanced its speech pathology assessment service, provided in partnership with Flinders University. The service resides at St Mary Magdalene School and provides speech and language assessments to students at northern Catholic schools.

Tyndale Christian School special education coordinator was concerned at the increasing number of students diagnosed with auditory processing disorder and at its impact on learning. The coordinator stated that students with a suspected hearing loss usually had a history of grommets in early childhood and that parents should continue to have hearing tests for them, although they had been cleared in the past, as there might be a residual effect on the children's hearing.

Another issue of concern at Tyndale was the long waiting list for hearing assessments at Children, Youth and Women's Health Service's Hearing Assessment Service. Delayed appointments often meant parents had to pay for private audiological assessment. The coordinator believed that this could be addressed by an inexpensive hearing screening tool for the school to use to screen all young children. This would help identify students with hearing problems and those requiring further testing.

Awareness raising

Health

Staff at Muna Paiendi Community Health Centre and Brady Street clinic commented that health practitioners needed to take a holistic approach to children's ear and hearing health and consider the impact of poor ear health and hearing loss on Aboriginal children's health and wellbeing. Poor ear health and hearing loss affected children's development and future.

Information was needed to highlight the many factors contributing to poor health, including otitis media and conductive hearing loss, for Aboriginal children. Aboriginal health workers were important in raising awareness and providing follow-up for children with ear disease and hearing loss. Usually, the Aboriginal health worker would assist families needing services. Muna Paiendi supported awareness raising and information sharing through the parents' group forum. The Muna Paiendi speech pathologist and parents' group worker link parents to health care information.

Children, Youth and Women's Health Service's Indigenous cultural consultants raise awareness among Aboriginal families of the services of Children, Youth and Women's Health Service and assist non-Aboriginal staff to work effectively with Aboriginal families.

Regular consultation between services at the local level improves service delivery. This is endorsed by the Children, Youth and Women's Health Service nurse at Kaurna Plains who said the Child Health Program (formerly the Ear Health Program) came out of a commitment from local staff of organisations—such as Kaurna Plains Early Childhood Centre; DECS; Nunkuwarrin Yunti; and Children, Youth and Women's Health Service—which were concerned with Aboriginal children's health in the northern suburbs.

Education

Care services and school sites supported either parent awareness or staff awareness strategies. Parent awareness needed to focus on potential long-term impact of middle ear disease and hearing loss on children's health, education, wellbeing and future. Some were particularly concerned about the effects of otitis media and conductive hearing loss on children who had experienced middle-ear problems in infancy and early childhood and their impact on the children's ability to cope with school.

Suggested strategies to raise awareness among Aboriginal parents included:

- easy-to-read brochures
- promoting family involvement in preschool or childcare centres through social activities
- school literacy programs involving families.

Staff awareness of the long-term impact was considered important but teachers' awareness of individual students' needs and strategies to assist their access to the curriculum were considered the major issues. Catering to children with permanent or fluctuating hearing loss becomes more difficult as students attend multiple classes with multiple teachers and the curriculum becomes more sophisticated. Tyndale Christian School's tagging system in its enrolment software, to give teachers immediate information regarding students' additional needs, is an attempt to address this issue.

Families
Most families agreed that more information on otitis media and conductive hearing loss would benefit families but would need to be supported with practical strategies such as transport to information sessions. Most families supported group forums.

Summary

Strengths of current service provision	**Areas identified by participants for strengthening**
• Aboriginal health services and outreach program • Access to hearing impairment services for state preschools and schools • Access to secondary and tertiary hearing services • Child and maternal health and chronic disease management are a focus of Aboriginal health services • Committed program personnel • Health service partnership between three significant Aboriginal health services in the northern region • Holistic approach to child health • Implementation of changes to acoustic environment including sound amplification systems and individual FM units in local preschools and schools • Integrated service delivery at Kaurna Plains Early Childhood Centre • Literacy development program based on oral language development implemented at one of the local schools • Local collaboration on Aboriginal child health at a preschool site • Partnership with parents at early childhood services • Past effective collaboration across health services and between health and education services • Strong relationships with local health and allied health professionals • Student records software that supports teacher information	• Effective enrolment procedures critical to early intervention for students with additional needs in Catholic and Independent schools • Greater support and recognition of role of Aboriginal health workers • Increase understanding of families, care personnel and educators, including newly graduated teachers, on otitis media and conductive hearing loss and its impact on Aboriginal children • Information for families and staff to recognise and identify otitis media and conductive hearing loss • Information for families on the broad range of factors that contribute to ear disease and hearing loss • Information provision to families that support cultural forms of communication • Support take-up of sound amplification systems • The long waiting lists for appointment at Children, Youth and Women's Health Service's Hearing Assessment Program • Training and development to increase awareness and early intervention at preschools

Port Augusta

The case study investigated programs or initiatives to address the otitis media and conductive hearing loss for Aboriginal children and students in the Port Augusta area. Community models, issues of concern, collaboration and community awareness were discussed. A summary of the interviews with health and education organisations and individuals is presented below. The full Port Augusta case study is in Volume 2.

Programs
Programs or initiatives addressing otitis media and/or conductive hearing loss in Aboriginal children are provided by:

- Pika Wiya Health Service
- Australian Hearing
- Children, Youth and Women's Health Service
- Northern and Far Western Regional Health Service
- Department of Education and Children's Services (DECS) Northern Country district's hearing impairment coordinators.

Health programs
Two major health programs/projects in Port Augusta and surrounding areas address otitis media and conductive hearing loss in Aboriginal children and students. Both focus on early intervention. The Otitis Media Clinical Support Systems Project, managed by Northern and Far Western Regional Health Service, targets Aboriginal children from birth to eight years, and the Pika Wiya Health Service's Indigenous Hearing Health Program cater to Aboriginal children, particularly preschool and school children. Like Ceduna–Koonibba Aboriginal Health Service, Pika Wiya Health Service is a Child Health Program site under the National Aboriginal and Torres Strait Islander Hearing Strategy.

Both programs are based on partnerships: the Otitis Media Clinical Support Systems Project with parents, Aboriginal community-controlled health organisations and community services; Pika Wiya Health Service's Indigenous Hearing Health program is delivered in partnership with Australian Hearing and DECS. In 2005, Pika Wiya became a partner in the Otitis Media Clinical Support Systems Project and this will complement its existing ear and hearing health programs.

The Otitis Media Clinical Support Systems Project was launched in 2005. Its primary aim is to reduce acute otitis media and suppurative otitis media in Aboriginal children from birth to eight years in the Northern and Far Western and Eyre health regions within two years.

The project is based on research and clinical evidence showing the high prevalence of otitis media and conductive hearing loss in Aboriginal children, particularly in regional and remote areas. Its focus is the early identification, diagnosis and medical treatment of ear disease in Aboriginal children to prevent recurring infection and subsequent middle ear disease, which can lead to long-term conductive hearing loss. The project has a strong element on follow-up, both medically and for support services.

Pika Wiya Health Service provides a comprehensive program to address otitis media and conductive hearing loss for Aboriginal children. The Indigenous Hearing Health program was initiated by the Australian Government's Office of Aboriginal and Torres Strait Islander Health and implemented nationally in Aboriginal community-controlled organisations in 1995 as part of the National Aboriginal and Torres Strait Islander Hearing Strategy.

Core features included:

- recruiting and training specialist hearing health Aboriginal health workers
- developing appropriate hearing-test facilities at Aboriginal health services
- developing protocols in managing ear disease in Aboriginal populations.

To complement the hearing health program, Pika Wiya Health Service provides a weekly ear medical clinic for children. Also provided is an ear health clinic: an audiological service offered biannually and at Pika Wiya's premises by a visiting medically qualified audiologist and audiometrist from Children, Youth and Women's Health Service Hearing Assessment Service.

Pika Wiya's Child Health team delivers primary services with a holistic approach for Aboriginal children and their families. Integrating ear and hearing health services into child and family health services was an important part of the initiative.

Education
All Port Augusta state preschools and primary schools participate in Pika Wiya's Indigenous Hearing Health Program. DECS is a program partner of Pika Wiya and all preschools and schools with Aboriginal enrolments are eligible for its ear health and hearing services. The Catholic Caritas College has about 20 Aboriginal students, but does not currently receive Pika Wiya's services.

All state schools and preschools in the Port Augusta area can also access the DECS Northern Country district Student Support and Disability team at Port Augusta. Services include support for hearing-impaired children and students affected by otitis media and conductive hearing loss. The support includes classroom strategies, advice on acoustics, learning strategies, and training and development. Catholic and Independent schools receive support from their sectors but develop local relationships to assist students with disabilities, including those with hearing loss.

Some education and care sites implemented initiatives that directly or indirectly assisted Aboriginal children and students with otitis media and conductive hearing loss. However, no site visited had implemented a targeted in-house support program.

Health and education initiatives

- Early Childhood Services
  The DECS Learning Together Program aims to improve early literacy learning for children from birth to three in the context of their families. Port Augusta Learning Together Program is attended weekly, primarily by Aboriginal families at Carlton Aboriginal School. Children in the playgroup are eligible for onsite health screening by Pika Wiya, including height, weight, skin and ear and hearing checks. The Learning Together Program does not use specific play/learning strategies for children with conductive hearing loss.

- Preschool
  Flinders Children's Centre (Tji Tji Wiltya) is a childcare centre and DECS preschool with 100 per cent Aboriginal enrolment. Flinders Children's Centre participates in Pika Wiya Health Service's Indigenous Hearing Health Program. Flinders Children's Centre implements the Breathe, Blow, Cough (BBC) program and staff are trained in dry mopping discharging ears. The centre employs an Aboriginal support worker to help children with additional needs such as language problems.

- Schools
  All Aboriginal primary school children in the Port Augusta region are eligible for Pika Wiya Health Service's Indigenous Hearing Health Program. Carlton Aboriginal School also participates in Pika Wiya's general school screening, including hearing health checks. Carlton Aboriginal School staff receives information and strategies from Pika Wiya to identify otitis media amongst students, and training and development from DECS hearing impairment coordinators. Health promotion information on ear disease and hearing loss, primarily developed by Australian Hearing, is important in the Indigenous Hearing Health Program. The DECS hearing impairment coordinators regularly use Australian Hearing information, as well as publications on hearing loss and education developed by the South Australian and interstate education departments. The Carlton Aboriginal School has sound amplification in all classrooms.

Model
The Otitis Media Clinical Support Systems Project is a medical management model focusing on early intervention and service delivery through partnerships with parents, Aboriginal health services and related services. There are smaller models within the project including engaging Aboriginal community-controlled health bodies as partners, clinical pathways for health practitioners, data management and evaluating aims and achievements.

The Pika Wiya Health Service's program is a model of hearing health care for Aboriginal children, developed and implemented nationally by the Office of Aboriginal and Torres Strait

Islander Health as part of the National Aboriginal and Torres Strait Islander Hearing Strategy 1995–1999.

The model of service delivery is providing ear and hearing screening, followed by appropriate medical, audiological and education management for Aboriginal children and students. Medical management uses the same clinical protocols being adopted by the Otitis Media Clinical Support Systems Project, specifically developed for this program by the National Aboriginal Community Controlled Health Organisations (NACCHO) on behalf of the Office of Aboriginal and Torres Strait Islander Health in 2001. Australian Hearing, in accordance with its protocols and as part of Australian Hearing's Specialist Programs for Indigenous Australians (AHSPIA) program, provides audiological management, including tests and hearing rehabilitation.

The DECS Northern Country district's office provides educational management through the Student Support and Disability team, including services for hearing impairment and speech pathology. The department's model for educational management is a referral model, which is based on students being referred by preschools or schools after they have obtained an audiogram that confirms hearing loss.

In the Port Augusta region, students are mostly referred by the Pika Wiya Health Service after they have participated in ear and hearing screening and conductive hearing loss has been identified by Australian Hearing testing and an audiogram produced. However, students are often referred by preschools and schools to the DECS Student Support and Disability team on the suspicion of hearing loss, or a range of other problems with educational performance, before any screening or testing has been undertaken. Hearing impairment coordinators can provide only limited services to students in the absence of audiological evidence. They advise and assist schools to have students' ears checked and hearing tested.

Issues of concern

Pika Wiya staff members were concerned that their program needed a greater number of appropriately trained staff. Staff also had concerns over:

- low uptake of child health programs by young parents
- difficulty in obtaining parents' signatures on health screening forms
- parents not understanding how critical it is for children to finish a course of medication.

Hearing impairment coordinators expressed concerns about many aspects of delivering hearing services to preschools and schools, including:

- the size of Northern Country district
- the distance and travel involved in supporting students
- time and resources needed to assist all referred students
- tracking transient students
- consistency issues concerning student screening in remote areas
- a lack of teacher awareness and understanding about how to cater for the needs of students with conductive hearing loss
- sites and teachers not acting on recommendations
- the need for increased attendance of Aboriginal children at playgroup and kindergarten
- the need for more trained Aboriginal health workers.

The Learning Together Program and local preschool did not identify any concerns, but the deputy principal of Carlton Aboriginal School stated that new staff members were often unaware of students' health histories and the impact of otitis media and hearing loss on students' learning, education and social development.

Evidence of collaboration

The Otitis Media Clinical Support Systems Project is a partnership program and includes working with parents, Aboriginal community-controlled health services and non-Aboriginal health and education services to address the prevalence of otitis media and conductive hearing loss affecting Aboriginal children.

Pika Wiya Health Service works with local, state and federal organisations to deliver culturally appropriate primary health care services, particularly for ear and hearing health. Partners in the Indigenous Hearing Health Program—Australian Hearing and DECS—provide the necessary follow-up for children identified with otitis media.

In Port Augusta and the surrounding region, all state preschools and schools with Aboriginal students have strong links to Pika Wiya and participate in its hearing health program: “In the last year, early detection, promotion, primary health care screening and management has been developed on a six-weekly cycle for outreach communities and homelands, in response to gaps identified in service delivery, for eye, ear and chronic disease” (Pika Wiya Health Service Inc 2005, p52).

Of the preschools and schools visited in Port Augusta, a strong relationship was evident between the DECS Northern Country district Student Support and Disability team and local sites. DECS district office is represented on advisory committees concerned with developing and enhancing services in the Port Augusta region.

Awareness raising

Information for parents was considered essential, particularly on the short-term and long-term impact of otitis media on children’s health, education, wellbeing and future. Information for teaching staff on identifying and recognising otitis media and conductive hearing loss was seen as necessary, particularly for new school staff. It was also recognised that successful awareness campaigns use Aboriginal people who are well known and respected by the community.

Summary

Strengths of current service provision	Areas identified by participants for strengthening
• Aboriginal health services and outreach program • Access to hearing impairment services for state preschools and schools • Access to secondary and tertiary hearing services and visiting specialist services • Child and maternal health a focus of the Aboriginal Health Service • Committed program personnel • Community awareness and education • Early intervention focus on target population birth to eight • Effective collaboration across health services and between health and education services • Focus on primary health care, prevention and health promotion • Health initiatives in care and early childhood settings • Holistic approach to child health • Home visiting • Identification of ear disease and hearing loss in Aboriginal children • Implementation of changes to acoustic environment, including sound amplification systems and individual FM units in local preschools and schools • Partnership with parents, and family empowerment • Programs supported by national policy framework and evidence-based practice and protocols • Range of programs focusing on ear and hearing health care implemented by the local Aboriginal health service • Specific project to reduce chronic suppurative otitis media in Aboriginal children in the region	• Renew focus of hearing health programs on Aboriginal infants and young children • Home visiting • Improve parental consent process for screening services • Improve understanding of the need for children to complete medication • Improved access to specialist intervention and care for Aboriginal children • Increase understanding of families, care personnel and educators, including newly graduated teachers, on the impact of otitis media and conductive hearing loss, particularly on educational outcomes • Information for families and staff to recognise and identify otitis media and conductive hearing loss • Key community people to assist with community awareness • More effective collaborative practice between local health service, early childhood site staff and families • Support for Aboriginal children and students with conductive hearing loss but no audiological evidence • Support for Aboriginal health care workers to undertake community awareness and education • Support young Aboriginal parents to access primary health services • Training and retention of qualified health workers

4. Discussion

Programs

There is evidence of programs addressing the prevalence of otitis media and conductive loss among Aboriginal children in South Australia. The study highlighted that most of these programs were health programs concerned with the diagnosis and treatment of otitis media and the prevention of recurrent otitis media.

Targeted state-based health programs
The case studies highlight four health programs that specifically address otitis media and conductive hearing loss in Aboriginal children in South Australia:

1. Indigenous Hearing Health Program in Port Augusta
2. Hearing Health Program in Ceduna
3. Otitis Media Clinical Support Systems Project in Port Augusta
4. Child Health Program at Kaurna Plains Early Childhood Centre in the northern suburbs of Adelaide.

The Indigenous Hearing Health Program in Port Augusta and the Hearing Health Program in Ceduna are Australian Government funded programs, implemented as part of the National Aboriginal and Torres Strait Islander Hearing Strategy 1995–1999, to address the well documented poor ear and hearing health status of Aboriginal and Torres Strait Islander populations. The purpose of the National Aboriginal and Torres Strait Islander Hearing Strategy was to provide a strategic approach to the Office of Aboriginal and Torres Strait Islander Health's Aboriginal and Torres Strait Islander Hearing Program in its goal of improving the hearing health status of Aboriginal and Torres Strait Islander children from birth to five years old (Office of Aboriginal and Torres Strait Islander Health 1995, p 1). The aim of the program was to improve access of Aboriginal and Torres Strait Islander children to primary hearing health care.

The strategy had four components, which included:

- equipping and training health workers in the detection, treatment and management of ear disease in Aboriginal and Torres Strait Islander children from birth to five years old
- establishing Child Health Program Sites and providing "funding to employ specialist hearing health workers to assist in the integration of a primary hearing health care program into an overall child health program" (Office of Aboriginal and Torres Strait Islander Health 1995, p 2)
- facilitating strategic research for best practice protocols for secondary and tertiary treatment for hearing impairment
- a capital infrastructure program, which included building soundproof testing facilities in some of the larger health services.

These primary health care programs are concerned with the early detection and medical management of otitis media in young Aboriginal children to prevent recurring otitis media and subsequent conductive hearing loss. Three of the four programs listed are implemented by or in collaboration with Aboriginal health services. Health promotion activities to raise awareness of the issues concerning ear and hearing health are an integral part of these programs.

The Otitis Media Clinical Support Systems Project is a jointly funded Australian and state government program administered by the Northern and Far Western Regional Health Service (South Australian Department of Health). The Otitis Media Clinical System Support Program, like the nationally funded hearing health programs, has a clear focus on prevention of recurrent otitis media and subsequent conductive hearing loss in Aboriginal infants and young children through early detection, intervention and medical management. The post project evaluation was released in July 2007 with ten recommendations, including the suggestion for opportunities to develop more collaborative practices between health and education providers (Travers et al 2007 p26).

The Child Health Program at Kaurna Plains Early Childhood Centre is a locally-based program, initiated by staff and management of the centre in 1996. At the time, Children, Youth and Women's Health Service and Nunkuwarrin Yunti of South Australia Inc were already providing health checks and clinical services to this group of preschool children, but approached Australian Hearing (an Australian Government agency) to provide audiological services and management of hearing loss for children aged three to five years at the Early Childhood Centre. The impetus for this program was the identification of a significant number of Aboriginal children at the centre suffering from middle ear disease, particularly runny discharging ears. The program was successful and Australian Hearing still provide quarterly hearing testing, review and management to identified preschool children. However, Children, Youth and Women's Health Service and Nunkuwarrin Yunti are no longer providing the same levels of service due to a more recent change in strategic direction.

Generic state-based health initiatives

The Children, Youth and Women's Health Service (CYWHS) is South Australia's leading provider of health services for children, young people and women. They work in partnership with their clients, the community, and with other service providers to promote, restore and maintain health. Developmental screening, including hearing and ear health, is undertaken by CYWHS, with appropriate referrals for further assessment or treatment dependent upon the issues identified. This could be within CWYHS, to private practitioners or to Australian Hearing for example.

In collaboration with Nunkuwarrin Yunti of South Australia Inc, Children, Youth and Women's Health Service established a dedicated program to provide developmental screening for Aboriginal schoolchildren not already accessing the statewide health screenings. Under this Metropolitan School Health Surveillance Program, ear and hearing testing was not specifically aimed at detecting otitis media, but Aboriginal children found to have ear and hearing issues were subsequently referred to Nunkuwarrin Yunti for medical management, and Australian Hearing for audiological management.

Working alongside Muna Paiendi Young Mum's group, Children, Youth and Women's Health Service is providing another example of preventative on-site health screenings for Aboriginal children, including access to health services and parenting advice for Aboriginal families.

Children, Youth and Women's Health Service's recent changes to early intervention service provision (including the Universal Contact initiative, the Family Home Visiting program and the employment of Indigenous cultural consultants) affords its staff the opportunity to provide Aboriginal families with more timely screening, health services and parenting advice.

This should be noted against the systematic investigation in 1999 of the coverage of newborn screening (Guthrie test) in South Australia, which highlighted that being Aboriginal was a risk factor for missed screening.

The most ready access to Aboriginal children by Children, Youth and Women's Health Service occurs through the preschool entry developmental health screen, conducted when children have reached an age of four to four-and-a-half years. This screen becomes critical for the detection of speech and language delays, particularly for those children with a history of recurrent otitis media and conductive hearing loss.

State-based education services

Education sites are the main recipients of primary health programs specifically addressing otitis media or providing preventative health screening for Aboriginal children. There was no evidence of any care or education site providing a population-based, targeted educational program for Aboriginal children affected by conductive hearing loss as a result of otitis media. In state schools, DECS hearing impairment coordinators provided support to individual students verified with conductive hearing loss to access the curriculum. Hearing impairment coordinators also try to provide general assistance if many students are affected but not verified. A number of schools and preschools implemented a combination of health, education and/or environmental initiatives to assist the prevention of recurring otitis media (eg nose blowing with nutrition programs) or to compensate for hearing loss (eg sound amplification systems with speech programs).

The implementation of strategies within preschools and schools results from intervention by both primary health services and the Department of Education and Children's Services' Student Support and Disability team (including hearing impairment and speech pathology services). Strategies used by Independent and Catholic schools were also the result of support provided by their respective education sector or dedicated special needs coordinators in individual schools.

The Department of Education and Children's Services provides hearing impairment services, and many of the state schools participating in this project had sought the assistance of district hearing impairment coordinators for Aboriginal children with suspected hearing loss. To become verified as having a hearing disability and thus eligible for services, students require audiological evidence (ie an audiogram) showing the extent of their hearing loss. Coordinators stated that they spent a lot of time providing assistance to Aboriginal children to obtain an audiogram that confirms the extent and duration of hearing loss. It should be noted that many hearing impairment coordinators monitor and support Aboriginal students with suspected hearing loss even though they may not have an audiogram. In 2007 DECS have provided funding to Flinders Medical Centre to take audiology screening services to two districts with a high Aboriginal student population in the south and north of Adelaide.

The study found that other assistance sought from hearing impairment coordinators by educators includes advice on hearing impairment, as well as training and development and advice on sound amplification systems. This study found that many educators were reluctant to use sound amplification systems as these were considered to be cumbersome and difficult to use. However, schools with significant Aboriginal enrolments, such as Ceduna Area School and Carlton Aboriginal School in Port Augusta, had installed them with great success. In this study, schools with a small percentage of Aboriginal children were least likely to adopt sound amplification systems, and this could be attributed to the expenditure involved. Educators proposed only limited teaching and learning strategies, such as phonemic awareness programs, to support children, including Aboriginal children and students, with hearing impairment.

Program considerations

Aboriginal Community Controlled Health Organisations (ACCHOs)

The results of the current study suggest that Aboriginal Community Controlled Health Organisations have been a fundamental component in the implementation of programs to address the prevalence of otitis media and conductive hearing loss for Aboriginal children. It is recognised that Aboriginal people tend to seek medical help only in a crisis, and ACCHOs offer a culturally appropriate environment and primary health services.

Both Australian Government funded hearing health programs (Indigenous Hearing Health Program in Port Augusta and Hearing Health Program in Ceduna) are conducted under the auspices of the local ACCHOs (ie Pika Wiya Health Service in Port Augusta and Ceduna–Koonibba Aboriginal Health Service in Ceduna). While the Office of Aboriginal and Torres Strait Islander Health provides these services with an operational framework and ongoing funding and training, the local ACCHO determines program implementation.

An integral part of the third major and specific health program addressing the prevalence of otitis media (Otitis Media Clinical Support Systems Project) involves service delivery through ACCHOs located within the Northern and Far Western Regional Health Service (South Australian Department of Health) to enable Aboriginal health organisations' successful provision of culturally appropriate primary health care. The current study found no specific health program addressing otitis media and conductive hearing loss in Murray Bridge, which may be attributed to an absence of an ACCHO. This is of concern given the increasing Aboriginal population in that area.

It should be noted that Sockalingam et al (2003) highlighted the importance of service delivery by Aboriginal health workers for raising awareness of otitis media and hearing loss, and thereby contributing to the decrease in prevalence of perforated eardrums and hearing loss amongst children and students in the Cherbourg (Queensland) community.

Infant and maternal health
Boswell and Neinhuys' study (1996) in remote Northern Territory communities highlighted that Aboriginal infants are likely to suffer from otitis media as early as six weeks of age. This demonstrates that for Aboriginal children otitis media is an infant and maternal issue. Literature on otitis media in indigenous populations in Australia and Canada suggests that risk factors impacting on the prevalence of otitis media and conductive hearing loss are related to maternal and infant health, including low nutrition of mothers and infants, low rates of breast feeding, smoking during pregnancy and early exposure to smoking environments. These risk factors are compounded by environmental factors such as overcrowding, big families and inadequate housing. Close habitation with siblings and other family members with respiratory infections and/or otitis media is believed to be a major risk factor for young infants.

Therefore, Aboriginal people can suffer chronic ear infection and deafness from a young age. It also needs to be recognised that for Aboriginal children otitis media and conductive hearing loss can be an ongoing issue, not a temporary condition (as is often the case for non-Aboriginal children), which can adversely impact on the development of speech and language.

One of the concerns emerging from this study is that, although otitis media is considered an infant and maternal issue, current programs focus on the provision of services to preschool and school age children. The National Indigenous Hearing Strategy 1995–1999 (underpinning the nationally funded hearing health programs) was targeted at children from birth to five years. In practice, the Indigenous Hearing Health Program in Port Augusta and Hearing Health Program in Ceduna have generally targeted preschool and junior primary children. The Kaurna Plains Early Childhood Centre's Child Health Program has also concentrated on children aged three to five years. The more recent Otitis Media Clinical Support Systems Project is the only program currently targeting children from birth.

Models of service provision

Health services
There is evidence of appropriate models of service delivery in the four health programs specifically addressing the prevalence of otitis media and conductive hearing loss for Aboriginal children. The overarching model could be described as a partnership and early intervention model, comprising a screening component for early detection and diagnosis, treatment of ear disease by medical management, and hearing loss management through audiological services.

Transition from primary health care to specialist medical services (eg ear, nose and throat specialists) and/or allied services (eg speech and language programs) could be more integrated. For example, one of the problems generally identified in the study was timely access by Aboriginal children to ear, nose and throat services. This could be due to a systemic problem, namely the inability of Australian Hearing to make direct referrals to ear, nose and throat specialists. Of all existing health programs, the Otitis Media Clinical Support Systems Project advocates seamless referral to related and secondary health services. However, this referral process is yet to be determined, perhaps given the recent implementation of the program.

Another issue identified in the study was the shortage and retention of appropriately trained Aboriginal health workers. Many participants cited the pivotal role of Aboriginal health workers in assisting families navigate health services provided by Aboriginal and mainstream health organisations.

Education services
The Department of Education and Children's Services (DECS) has been and continues to be a partner in preschool- and school-based health programs such as the Metropolitan Child Health Surveillance Program, Pika Wiya Hearing Health Program and the Kaurna Plains Early Childhood Centre Child Health Program. Primarily, DECS provides health services with access to educational sites to facilitate primary health screening.

DECS also has a stand-alone model for providing services to preschools and schools to assist hearing impaired children and students to access the curriculum. Components of the service model include:

- the Early Intervention Service—Hearing Impairment—a statewide service for children from birth to school age
- Centres for Hearing Impaired—five primary and three secondary services, all co-located with mainstream schools
- Coordinators: Hearing Impairment—district-based personnel supporting students with hearing impairment
- Guidance Officer: Hearing Impairment—located within the Statewide Verification and Professional Support Team.

The study found that in state schools Aboriginal children with suspected hearing loss and no audiological evidence (and unlikely to ever obtain an audiogram) become ineligible for ongoing individual services provided by DECS hearing impairment coordinators. However, most coordinators continue to provide some monitoring of students' progress and strategies to support learning in the classroom. Coordinators spend a considerable amount of support time pursuing Aboriginal children's hearing screenings and referrals to specialist services.

Some Independent schools have a collaborative relationship with health providers such as Australian Hearing (eg Crossways at Ceduna) to obtain the necessary audiological assessments. However, the majority of non-government schools do not have strong links with health providers or specialist services. In this case, health and learning supports for hearing impaired students remain the responsibility of individual education sites. While Catholic Education SA and the Association of Independent Schools of South Australia provide a statewide service for students with a disability including hearing impairment there is no state-wide services designated solely to hearing impairment.

DECS hearing impairment coordinators also discussed the difficulties associated with individual education sites adopting the coordinators' recommendations for supporting Aboriginal students with conductive hearing loss. This study found that some schools could easily describe strategies implemented for Aboriginal students identified with hearing loss, but these strategies were based mostly on improving environmental factors (eg placement of children in classrooms and/or installation of sound amplification systems).

Other intervention strategies documented in the *Do you hear what I hear: Living and learning with conductive hearing loss* resource (Department of Education (Western Australia) 2002) and used regularly by hearing impairment coordinators were not generally cited by educators, but identified as used to some degree by this study. These intervention strategies involved:

- an increase in children's understanding of hearing problems
- a focus on oral language skills as the foundations of literacy
- a focus on the sound amplification system
- linking sounds to the written code
- analysing spelling errors to inform teaching
- implementing a peer tutor program.

Collaboration

There is strong evidence of collaboration between different health providers to deliver primary health care specifically addressing otitis media and conductive hearing loss in Aboriginal children. The main stakeholders are Aboriginal Community Controlled Health Organisations; Children, Youth and Women's Health Service; Central Northern Area Health Service; Country Health; and Australian Hearing. There is also evidence of collaboration between health and education, as the Department of Education and Children's Services is often a program partner by facilitating access or providing educational advice. The proposed Children's Centres will further collaboration between health and education services supporting younger Aboriginal children.

There was little evidence of family involvement in programs, except in the Otitis Media Clinical Support Systems Project, which supported a partnership with parents for the detection and management of otitis media. The program recognised parents as integral to addressing the prevalence of otitis media and, consequently, launched a media campaign to raise parent awareness of otitis media and the importance of seeking immediate medical treatment for their children.

Both health and education providers explained that collaboration with families was achieved through home visiting programs. Home visiting was considered by all participants to be integral to engaging with Aboriginal parents and sharing information. Home visiting programs enhanced the capacity for parents to become engaged to work with their children in a comfortable and familiar environment. Home visiting programs are an important means of delivering services to Aboriginal families because, otherwise, many services do not have contact with families until children commence at preschool at three years.

Awareness

The study highlighted that although there was awareness of otitis media as a health problem for young Aboriginal children, there was little awareness by families and educators that otitis media could result in conductive hearing loss, with longer-term impact on educational, social and emotional development.

Families

A key finding of interviews held with Aboriginal families included limited knowledge of otitis media, unless it had directly affected them or their children, and little understanding of the longer-term impact of resulting conductive hearing loss. Another major finding was that families had limited knowledge of available health screening services, unless:

- their children attended an educational site providing these services (eg Kaurna Plains Early Childhood Centre Child Health Program)
- a dedicated screening program was offered to their children on an ad hoc basis in an early childhood setting (eg Children, Youth and Women's Health Service's nurse attending the Nunga playgroup in Murray Bridge).

The majority of programs addressing otitis media and conductive hearing loss have evolved from health organisations, particularly Aboriginal Community Controlled Health Organisations, and this may explain why families are more familiar with health impacts of otitis media and conductive hearing loss rather than educational impacts. Otitis media is primarily a health issue but may become an educational one, if it results in hearing loss.

Educators

Educators often stated that there is a need for raising teacher awareness of the impact of otitis media and conductive hearing loss on learning for Aboriginal children. The study found that educators at Aboriginal preschools and schools with significant Aboriginal enrolment have the greater awareness of otitis media and conductive hearing loss. However, there was still a clear trend of associating otitis media with chronic suppurative otitis media (runny ear). If there was little evidence of runny ear amongst the student population, otitis media was not considered to be a concern for the educational site.

A concern highlighted by the study involved school staff members with a long history in Aboriginal education who believed they could detect ear and hearing problems in Aboriginal children easily. There is an obvious disparity between beliefs held and the actual identification of otitis media and conductive hearing loss amongst Aboriginal children. The more likely scenario is that educators are adept at detecting learning difficulties (eg behaviour issues, poor attention and concentration, and delayed academic progress), and often hearing tests are the first tests to be considered when a child shows a delay or difficulty with participation in the curriculum.

Educators recognised that detection of hearing loss and learning supports are more likely to occur in the junior primary years where children have one teacher for the whole year. It was also accepted that detection and appropriate learning supports become more difficult as children grow older and develop better masking strategies, especially in the middle years where they may have multiple classes with different teachers.

Educators were aware of otitis media or middle ear infection and also understood that it could lead to conductive hearing loss. Educators understood the implications of hearing loss on children's development in the areas of language, communication and literacy. However, they were less aware of learning strategies to assist these children to access the curriculum. Training and development for educators in otitis media and conductive hearing loss will assist with early identification, referral to necessary health services, and use of appropriate learning strategies for affected Aboriginal children.

Appendix 1—Task Group and Committee

Task Group membership

Ms Kerry Presser Co-Chairperson	Early Childhood Australia (SA Branch)
Mr David Rathman Co-Chairperson	Aboriginal Education and Employment Strategies Unit, DECS
Ms Vicki Brown	Aboriginal Students with Disabilities Representative
Ms Mary Buckskin	Aboriginal Health Council of South Australia
Ms Libby Burns	Association of Independent Schools of South Australia
Ms Claire Cotton	Non Government Special Education Committee
Ms Sharon Duong	Catholic Education SA
Ms Cheryl Grady	Learning Improvement and Support Services, DECS
Ms Susan Hine	Anangu Education Service
Ms Tanya Mills	Aboriginal Education and Employment Strategies Unit, DFEEST
Ms Kim Morey	Aboriginal Health Division, Department of Health
Associate Professor Linnett Sanchez	Department of Speech Pathology and Audiology, Flinders University

Ministerial Advisory Committee: Students with Disabilities

Ms Christel Butcher	Executive Officer
Ms Fiona Snodgrass	Project Officer

Appendix 2—Terms of reference

To investigate and record initiatives which have been established in metropolitan and regional centres in South Australia for Aboriginal children and students with, or at risk of, otitis media and conductive hearing loss promoting:

- collaboration between health and education
- community-based models for families
- successful transition at all levels of learning (ie what support is required for successful transition at each level of schooling).

To identify information and approaches that would be appropriate for:

- families
- teachers
- pre-service teachers
- educational support staff
- health workers

to raise awareness about the short- and long-term effects of otitis media and conductive hearing loss on learning.

Appendix 3—Participating organisations

Case studies and survey
Australian Hearing

Carlton Aboriginal School
Catholic Education South Australia, Special Education and Indigenous Education Team
Ceduna Area School
Ceduna Preschool
Ceduna–Koonibba Health Service
Children, Youth and Women's Health Service—Streaky Bay
Children, Youth and Women's Health Service—Elizabeth
Children, Youth and Women's Health Service's Indigenous Consultant, Gilles Plains
Children, Youth and Women's Health Service's Indigenous Consultant, Murray Bridge
Children and Families Team, Murray–Mallee Community Health Service
Crossways Lutheran School
Davoren Park School
DECS North Country district office, Port Augusta
DECS hearing impairment coordinators
DECS Learning Together Program at Fraser Park Child Parent Centre
DECS Learning Together Program at Para West Adult Campus
DECS Early Learning Program, Ceduna
Flinders Children's Centre (Tji Tji Wiltya)
Fraser Park Primary School
Independent Schools Association of South Australia Special Education Team

Kaurna Plains Early Childhood Centre
Kaurna Plains School
Koonibba Aboriginal School
Koonibba Childcare Centre
Minya Bunhii Childcare Centre
Muna Paiendi Community Health Centre
Murray Bridge Christian College
Murray Bridge South Kindergarten
Nunkuwarrin Yunti Aboriginal Health Service Inc
Otitis Media Clinical Support Systems Project, Port Augusta Hospital
Pika Wiya Aboriginal Health Service
St Joseph's Catholic College
St Mary Magdalene School
Tyndale School

Interviews
Aboriginal Health Council of South Australia
Australian Education Union
Australian Hearing
Children, Youth and Women's Health Service Hearing Assessment Service—Adelaide
Damien Howard, Psychologist, Northern Territory
DECS Early Childhood Services—Aboriginal Unit
DECS Inner South Metro hearing impairment coordinators
DECS Learning Together Program Policy Officer and Coordinators
DECS Project Officer—Hearing Impairment
Department of Audiology, Darwin Hospital
Department of Speech Pathology and Audiology, Flinders University
Karpandi Women's Centre

Appendix 4—Hearing impairment coordinators' survey

CONFIDENTIAL

Ministerial Advisory Committee: Students with Disabilities Aboriginal Students with Disabilities: Otitis Media and Conductive Hearing Loss Project

Government of South Australia

Ministerial Advisory Committee:
Students with Disabilities

4th Floor, Lifeplan Building
111 Gawler Place
Adelaide SA 5000

Tel 08 8226 3632
Fax 08 8231 8961

Email: minadv@saugov.sa.gov.au
Website: macswd.sa.gov.au

Questionnaire for Hearing Impairment Coordinators

Introduction

Each year the Ministerial Advisory Committee: Students with Disabilities undertakes research projects related to the education of students with disabilities in order to provide advice to the Minister for Education and Children's Services. The *Aboriginal Students with Disabilities: Otitis Media and Conductive Hearing Loss* is one of the projects for 2005. For the purpose of this project, we have used NSW Health's definition of Otitis Media as a general medical term for inflammation or infection of the middle ear (Otitis Media Strategic Plan for Aboriginal Children, NSW Health, April 2000).

The focus of the project is the impact of Otitis Media and Conductive Hearing Loss on the education and learning outcomes of Aboriginal children and students in South Australia, and how health, education and disability services can work collaboratively to address this issue. Hearing Impairment Coordinators (and their counterparts in the Catholic and Independent sectors) are recognised as essential to addressing the educational needs of all students, including Aboriginal students with hearing impairment. This survey seeks information on the referral process and your role and qualifications in relation to the ear health of Aboriginal students to inform the aims of this project. All information provided is strictly confidential.

Referral of Aboriginal Students

1. District:

2. Of your caseload for 2005, please estimate how many referrals are related to Aboriginal students. (Term 1, 2 & 3)

Term 1:	Term 2:	Term 3:

3. For those who have worked in the position longer than five years, have you been able to observe any significant changes amongst Aboriginal students' ear health?

Yes ☐ No ☐

If yes, please describe:

4. From your experience, at what stage of ear health do schools refer Aboriginal students to Hearing Impairment Coordinators?

5. Please describe the reasons given for referral of Aboriginal students to Hearing Impairment Coordinators as stated on referral forms.

Reasons (Please rank in terms of frequency)

Role of Hearing Impairment Coordinators

6. Are there any protocols/procedures that relate specifically to supporting Aboriginal children and students with suspected conductive hearing loss in your sector?

Yes ☐ No ☐

If yes, please describe:

7. Once an Aboriginal student is referred with Otitis Media and/or conductive hearing loss what are the steps taken by you for that student?

8. Briefly explain how other members of the District Team in your district support Aboriginal students with Otitis Media and/or conductive hearing loss:

9. Which government services (other than DECS services) do you use to address the needs of Aboriginal students with Otitis Media and/or conductive hearing loss?

10. Which non-government services do you work with concerning Aboriginal students with Otitis Media and/or conductive hearing loss?

11. What information/resources do you give to classroom teachers for Aboriginal students identified with Otitis Media and/or conductive hearing loss?

12. What information/resources do you give to parents/care-givers of Aboriginal students with Otitis Media and/or conductive hearing loss?

13. How are parents/care-givers of Aboriginal students with Otitis Media and/or conductive hearing loss supported by you?

14. Please list significant local, national or international resources that assist your work with Aboriginal students with Otitis Media and/or conductive hearing loss:

15. In your opinion, how could services be improved for Aboriginal students with Otitis Media and/or conductive hearing loss?

Qualifications/Experience

16. Hearing Impairment Coordinator for years

17. Qualifications:

18. Do you have any issues or concerns regarding your own professional development and training needs in terms of this project?

Thank you for your time and cooperation. All responses are confidential.

Appendix 5—Contact details for service providers

Health

Aboriginal health services
In many areas of the state, Aboriginal health services are provided through regional hospitals and community health centres. Many centres offer Aboriginal health care workers and outreach teams. In addition, the following services may be available:

- Aboriginal Community Controlled Health Services
    - *Ceduna–Koonibba Aboriginal Health Service*, telephone 8625 3699 or 8626 2500 (based in Ceduna)
    - *Nganampa Health Service*, telephone 8954 9040 (based in north-west South Australia)
    - *Nunkuwarrin Yunti of South Australia*, telephone 8223 5011 (based in Adelaide with clinics in Elizabeth Downs, Largs Bay, Queenstown and Noarlunga Centre)
    - *Pika Wiya Health Service*, telephone 8642 9999 (based in Port Augusta)
    - *Port Lincoln Aboriginal Health Service*, telephone 8693 0162 (based in Port Lincoln)
    - *Umoona Tjutagka Health Service*, telephone 8672 5122 (based in Coober Pedy)
    - *Yalata Maralinga Health Service*, telephone 8625 6237 (based in Yalata).

- Hospital Aboriginal Health Teams offer support to Aboriginal and Torres Strait Islander patients, their families and escorts during their stay at hospital. Teams can assist with arrangements for transport to and from the hospital and with accommodation, particularly for people from rural and remote areas. Information about hospital procedures and processes is provided. Contact the following:
    - *Flinders Medical Centre* Aboriginal Liaison Officer, telephone 8204 5178
    - *Lyell McEwin Hospital Aboriginal Community Health*, telephone 8182 9206
    - *Royal Adelaide Hospital*, telephone 8222 4000
    - *The Queen Elizabeth Hospital* Social Work Department, telephone 8222 7250
    - *Women's and Children's Hospital* Aboriginal Liaison Worker, telephone 8161 7381.

Australian Hearing
Australian Hearing was formerly Australian Hearing Services. It provides hearing assessments, hearing aids and devices as well as hearing rehabilitation services for any person under the age of 21 years. Priority is given to those people referred by an ear, nose and throat specialist or paediatrician, or where permanent hearing loss has been confirmed. There are quarterly visiting services to major regional centres. Telephone 13 1797 to be connected to your nearest office. Website is at <www.hearing.com.au>. (Australian Hearing is based in Adelaide.)

CanDo4Kids—Townsend House
This is a charitable children's services organisation, based at Hove in South Australia. It provides a range of community services to South Australian children and young adults (and their families) who are blind/vision impaired, deaf/hearing impaired or deaf–blind, and who may have additional disabilities. Services focus on a child's developmental, social and technological needs and include programs for early intervention, occupational therapy, family support, mentoring, recreation, speech pathology and assistive technology. Services specific to hearing impairment include early intervention and family support, Auslan, key word signing, speech pathology and auditory verbal therapy. A Resource and Toy Library and a range of specialised activity programs to enhance social skills, self-esteem and independence are available. Telephone 8298 0900. Website is at <www.cando4kids.com.au>.

Child allied health teams
These are multi-disciplinary teams consisting of paediatricians, occupational therapists, speech therapists, psychologists and related professionals who focus on child development and health. Contact local community health centres/hospitals to check service availability.

Child and Adolescent Mental Health Services (CAMHS)
This is a government agency providing a range of confidential and therapeutic services for families with children and adolescents between birth and eighteen years who are experiencing emotional, behavioural, social or mental health problems. Services are available in metropolitan and country regions of South Australia from either Southern or Northern CAMHS. Parents and guardians many telephone or visit the CAMHS service closest to them. Adolescents over sixteen years of age may contact CAMHS without parent or guardian consent or knowledge. Relevant professionals may also contact CAMHS, but parent or guardian consent is required to formalise a referral.

Northern CAMHS—Metropolitan
Elizabeth 8252 0133
Paradise 8207 8999
Port Adelaide 8341 1222
Women's and Children's Hospital 8161 6622

Northern CAMHS—Country Region, telephone 8632 5304
Services are available in Angaston, Balaklava, Clare, Kadina, Maitland, Minlaton, Port Augusta, Port Lincoln, Port Pirie, Wallaroo and Whyalla. For more information visit: <www.wch.sa.gov.au/services/az/divisions/mentalhealth/ncamhs/index.html>.

Southern CAMHS—Metropolitan
Flinders 8204 5423
Marion 8298 7744
Noarlunga 8326 1234
Seaford Outreach 8326 1234

Southern CAMHS—Country Region
Kangaroo Island 8482 2434
Mount Barker 8535 6780
Murraylands 8535 6780
Riverland 8582 4290
South East 8724 7055
Victor Harbor 8552 3033

For more information visit <www.flinders.sa.gov.au/mentalhealth/pages/camhs>.

Children's Assessment Teams
Child Development Unit (CDU), Lyell McEwin Hospital—The Gordon McKay Child Development Unit adopts a team approach to the coordination and provision of assessment services for children with developmental concerns.

Eligibility
Children who have developmental difficulties in two or more areas of function and who are aged up to their eighth birthday are eligible for assessment provided by the unit.

Children who are referred should have difficulties in at least two of the following areas:
- gross motor skills (eg crawling, walking, jumping)
- fine motor skills (eg drawing, cutting, building)
- speech and/or language development (talking and/or understanding)
- play skills
- social skills
- complex medical conditions.

The following professions form the Gordon McKay Child Development Unit team:
- physiotherapist
- occupational therapist
- speech pathologist
- psychologist
- paediatrician.

The Gordon McKay Child Development Unit provides:
- developmental assessments
- regular progress reviews
- autism assessments.

Who can refer?
- general practitioner or paediatrician
- Children, Youth and Women's Health Service
- childcare workers and kindergarten or school staff
- Families SA (formerly CYFS)
- other agencies
- health professionals such as speech pathologist and occupational therapist

For more information telephone 8182 9379.

Child Development Unit (CDU), Port Augusta—This CDU provides a coordinated interagency model of supporting children with difficulties in more than one area of development (ie health, learning and behaviour). Families/carers and agency staff can make referrals with parent/carers' consent by contacting the CDU Coordinator on 8648 5800. Assessments are arranged with the appropriate services (eg Child Health Team of Flinders and Far North Community Health Service and paediatricians from the Paediatric Unit). Regular review/support meetings are arranged. Parents/carers are able to request additional meetings.

Child Development Unit (CDU), Port Pirie—This Unit is a service for children 0–18 years, who are having difficulty in two or more areas of development (eg communication, coordination and learning difficulties), and require a coordinated management plan. The CDU offers a team approach to the evaluation of children's needs and responds to parents' requests by:
- arranging cross-referrals for children if needed
- coordinating information from the agencies who are working with a child
- explaining assessment results and recommendations to parents, teachers and other relevant people
- providing appropriate assistance for the child, in partnership with parents
- appointing a contact person who will liaise with parents and team members to coordinate services provided
- arranging suitable and regular review meetings for parents and professionals working with the child to review the child's progress and set future plans and goals
- providing a written report from the review meetings, for parents to keep records of their child's progress.

Referrals to the CDU can be made by parents or professionals (with parental consent) by contacting the Port Pirie Regional Health Service Referrals office on 8638 4693.

Child Development Unit (CDU), Whyalla—This CDU aims to provide a holistic approach that responds to the needs of parents who are concerned about their child's development. The CDU provides assessment for children with a wide range of developmental delays, including speech or language problems, learning difficulties, and social and physical problems. The CDU serves children who have multiple problems or those in their earlier years who have a single major problem (such as motor delay). The unit includes a developmental paediatrician, occupational therapist, physiotherapist, speech pathologist, social worker, dietician, orthotist, podiatrist and coordinator. The unit has an open referral policy which means that anyone (with parental consent) may refer by contacting the Unit Coordinator, telephone 8648 8302.

Child Development Unit (CDU), Women's and Children's Hospital—The Unit provides assessment services for children with a wide range of developmental problems, including delayed development, speech and language problems, learning difficulties, social difficulties and problems with physical activities. Referrals for children who have two or more areas of developmental delay may be made by families or by a variety of professionals (with parental consent), by contacting the Unit Coordinator, telephone 8161 7287. (This CDU is based in Adelaide at the Women's and Children's Hospital with clinics at Mount Gambier, Naracoorte, Port Lincoln and Whyalla.)

Children's Assessment Team (CAT), Flinders Medical Centre—This team provides specialist, tertiary level inter-disciplinary assessments of children (0–16 years) from the southern metropolitan and regional areas of South Australia. Team members include clinical psychologists, occupational therapists, paediatricians, physiotherapists, a special educator, speech pathologists and Child and Adolescent Mental Health Service (CAMHS) representation. The team works on a one-day assessment model, offering assessments of two children per day on Mondays and Tuesdays. Parents are able to receive verbal feedback regarding the results of their child's assessment on the same day as the assessment. Assessments are provided for difficulties such as developmental delay and learning problems, as well as diagnostic assessments of autism spectrum disorders. Following CAT assessment, referrals to appropriate services are initiated. Referrals to CAT are made through professional agencies including community health services, hospitals, general and private medical practitioners, and educators. Contact the secretary, telephone 8204 4433. (CAT is based at Flinders Medical Centre, Bedford Park.)

Riverland Regional Health Service Inc—Assessments and services are available for children throughout the Riverland region from Riverland Regional Health Service Inc which is based in Berri. More information is available and referrals can be made through the Referral Intake Officer, telephone 1800 332 858.

Children, Youth and Women's Health Service

Children, Youth and Women's Health Service provides a range of community child and youth health services. There are three metropolitan teams and two country teams who work in a variety of child health centres across the state. Telephone 8303 1500. – Website is at <www.cywhs.sa.gov.au>. The 24-hour Parent Helpline can be accessed on 1300 364 100 for the cost of a local call anywhere in South Australia. This organisation manages the Access Assistant Program and employs a number of Early Intervention Coordinators across the state.

Community health centres

(See Regional Community Health and Hospital Services.

Cora Barclay Centre

The Cora Barclay Centre is a specialist disability organisation providing services for children and young people with hearing impairment 0–18 years. The Centre applies auditory–verbal practice, which is the application of techniques, strategies, conditions and procedures that promote optimal acquisition of spoken language through listening. This approach enhances the development of the child's personal, social and academic life. The auditory–verbal philosophy is a logical and critical set of guiding principles. These principles outline the essential requirements to realise the expectation that young children who are Deaf or hearing impaired can be educated to use even minimal amounts of amplified residual hearing. Use of amplified residual hearing via cochlear implants or hearing aids in turn permits children who are Deaf or hearing impaired to learn to listen, process oral language and to speak. The centre provides family-centred therapy, guidance and advocacy through early intervention programs, school support in metropolitan Catholic and Independent schools and professional training and development. Audiological services are provided on-site by the Women's and Children's Hospital, Australian Hearing and a part-time audiologist employed by the centre. Telephone 8344 2924. Website is at <www.corabarclay.com.au>.

DeafSA

Deaf SA's service provision to Deaf and hearing impaired people includes the Nunga Kuinyo Programme (Aboriginal Deafness Program). The program is coordinated by DeafSA's

Indigenous Worker and her role includes establishing and maintaining a network amongst Indigenous Deaf and hearing impaired people through contact with schools, disability services and outreach visits to regional and remote areas. The Nunga Kuinyo program provides a range of options for Indigenous Deaf and hearing impaired people including opportunities to meet other Deaf and hearing impaired people and access to the full range of services provided by DeafSA.

Department of Family and Community Services and Indigenous Affairs (FaCSIA)
FACSIA is an Australian Government department that funds organisations to deliver employment and advocacy services to people with a disability, and respite services/support to carers of young people with severe and profound disabilities. Eligibility criteria apply. Telephone 1300 653 227. Website at <www.facs.gov.au>. (FaCSIA is based in Adelaide.)

Early Intervention Coordinators
Early Intervention Coordinators are employed by Children, Youth and Women's Health Service and provide support for families of young children 0–8 years with developmental delays or disabilities. Early Intervention Coordinators supply information about local services and assist families to find the most appropriate support in their area. In country areas, telephone the local Children, Youth and Women's Health Service office for assistance, or the Adelaide office, telephone 8303 1500. (Coordinators are based in Berri, Clare, Enfield, Kadina, Mount Gambier, Nuriootpa, Port Lincoln, Salisbury and Whyalla.)

Families SA (formerly Children, Youth and Family Services)
Families SA is part of the state government Department for Families and Communities. For assistance between 9am and 5pm on a weekday, contact the nearest office.

In the metropolitan area there are offices at: Aberfoyle Park, 8374 6111; Adelaide, 8304 0120; Elizabeth, 8207 9000; Enfield, 8269 8333; Gawler, 8521 4444; Marion, 8298 0800; Modbury, 8407 4999; Noarlunga, 8207 3000; Salisbury, 8209 4910; and Woodville, 8406 2777.

There are country offices in Berri, 8595 2400 or Freecall 1800 800 195; Ceduna, 8626 2444 or Freecall 1800 330 032; Coober Pedy, 8672 4555 or Freecall 1800 032 205; Mount Gambier, 8724 4844 or Freecall 1800 800 747; Murray Bridge, 8535 6200 or Freecall 1800 330 042; Port Augusta 8648 5060 or Freecall 1800 100 118; Port Lincoln, 8688 3344 or Freecall 1800 018 331; Port Pirie, 8638 4311 or Freecall 1800 804 550; and Whyalla, 8648 8880 or Freecall 1800 245 242.

If a crisis happens after hours or on a weekend, contact Crisis Care on 13 1611. To report suspicions of child abuse or neglect, contact the Child Abuse Report Line on 13 1478. The Child Abuse Report Line operates 24 hours a day, every day of the year. You can get advice about issues of concern as well as reporting suspected abuse or neglect and your call will be kept confidential. Yaitya Tirramangkotti provides assistance in cases involving Aboriginal families.

For more information visit the Families SA website at <www.dfc.sa.gov.au/cyfs>.

Flinders University Hearing Services/Flinders University Speech and Hearing Clinic
This is a service based at Flinders University campus, which provides regular clinics, both audiology and in conjunction with an ear, nose and throat specialist. The Department of Audiology and Speech Pathology also provides hearing screening for special projects including the Metropolitan Area Schools project in southern suburbs of Adelaide and the APY Lands project. Both projects have been conducted in collaboration with the Department of Education and Children's Services and have focused on clinical service.

Hearing Solutions
Hearing Solutions is an Adelaide-based community service providing information, education, communication skills training and hearing advisory services for people with a hearing disability, their families and carers. Individual consultations or group sessions are conducted. The Resource Centre has a variety of assistive listening devices for trial and demonstration. Staff members provide professional and community education and awareness programs and visit six major country regions on a quarterly basis as part of the country outreach service. The Specialised Smoke Alarm Scheme is also conducted from the Hearing Solutions office. Telephone 8203 8394, or toll free 1800 738 855, or TTY 8203 8391 (the TTY is a text telephone used by a person who is Deaf or hearing impaired).

Miriam High Special Needs Centre (Port Augusta)
Miriam High Special Needs Centre offers a community based early intervention program for children with a disability or special developmental needs between 0-6 years. The Centre is administered through the *Corporation of the City of Port Augusta* (telephone 8641 9100) and operates independently in conjunction with the *Port Augusta Child Care Centre* (telephone 8642 4966). For more information on the Centre, contact the Coordinator. Telephone 8642 2200, Fax 8642 3545 or Email specialneeds@portaugusta.sa.gov.au

Parent Helpline
The Parent Helpline is a government funded 24-hour telephone information service managed by Children, Youth and Women's Health Service. This service provides information on a range of parenting issues including health, behaviour and relationships. It is available to families, teachers, childcare workers and others who work with children and young people 0–25 years. Telephone 1300 364 100 for the cost of a local call anywhere in South Australia. For more information visit the website at <www.cyh.com>.

Regional health services
South Australia's regional health services provide government funded health care through a range of therapy and medical services. Services for children with developmental delay and disability include speech pathology, occupational therapy, hydrotherapy services, growth and development clinics, visiting specialists (eg psychologists, psychiatrists and paediatricians) and Child Allied Health teams. Refer to local telephone directory for regional community health or hospital telephone contacts.

Country SA has seven regional health services located as: Eyre, Hills Mallee Southern, Mid North, North and Far Western, Riverland, South East and Wakefield. For more information visit www.erhs.sa.gov.au/1about/role.php.

Care services and education

Association of Independent Schools of South Australia (AISSA)
Inquiries should be directed to the Special Learning Needs Coordinator at the AISSA office. Telephone 8179 1400.

Catholic Education of South Australia (CESA)
Further information is available from the Special Education Team and the Indigenous Education Team at CESA. Telephone 8301 6600.

Department of Education and Children's Services
Further information on DECS disability services or Aboriginal education is available from district offices.

District Offices

There are 18 districts, each with a district director and a support team. The districts are designed to work in a cohesive, consistent way in supporting children's services, preschools and schools to put government and DECS policies into practice.

Services provided include:

- Provide supportive, enabling leadership to children's services, preschools and schools
- Improving direct support to children's services, preschools and schools
- Managing support services to children and students
- Improving children's and students achievements across children's services, preschools and schools
- Supporting more effective implementation of system wide initiatives and policies
- Improving the connections between sites and between sites and central office
- Fostering decision making at a local level

	District	Address	Phone
1	**Inner South**	Beatty Street Flinders Park 5025	8416 7333
2	**Metro West**	Beatty Street Flinders Park 5025	8416 7333
3	**South West**	Beatty Street Flinders Park 5025	8416 7333
4	**East**	Briar Road Felixstow 5070	8366 8800
5	**North East**	Briar Road Felixstow 5070	8366 8800
6	**Wallara Outer South**	5th Floor Noarlunga House Noarlunga Centre 5168	8207 3700
7	**Salisbury**	1st Floor Elizabeth House Oxenham Drive Elizabeth 5112	8256 8111
8	**Kumangka Para**	1st Floor Elizabeth House Oxenham Drive Elizabeth 5112	8256 8111
9	**Hills Murraylands**	20 Beatty Terrace Murray Bridge 5253 5-11 Briar Road Felixstow 5070	8532 0700 8366 8800
10	**Barossa**	1st Floor Elizabeth House Oxenham Drive Elizabeth 5112	8256 8111
11	**Southern Sea & Vines**	5th Floor Noarlunga House Noarlunga Centre 5168	8207 3700
12	**Wakefield**	157 Main North Road Clare 5453 13 Taylor Street Kadina 5554	8842 6650 8821 2555
13	**Riverland**	3 Kay Avenue Berri 5343	8595 2323

14	**Flinders**	Spencer Institute of TAFE Mary Elie Street Port Pirie 5540 157 Main North Road Clare 5453	8638 1801 8842 6650
15	**Limestone Coast**	64 Commercial St West PO Box 397 Mount Gambier 5290 44 Robertson Street Naracoorte 5271	8724 5300 8762 3099
16	**Eyre**	34 Oxford Terrace Port Lincoln 5606	8682 3788
17	**Northern Country**	Rupert Street Port Augusta 5700 115 Nicolson Avenue Whyalla Norrie 5608	8641 6877 8645 6568
18	**Aboriginal Lands**	87-101 Folland Avenue Northfield 5085	8359 4626

Inclusive Directions
Inclusive Directions works with childcare staff to support the inclusion of all children, including those with additional needs and those from culturally and linguistically diverse backgrounds. The service provides inclusion support, information and advice, and specialised equipment. It is available to Commonwealth funded:

- long day care
- Out-of-School-Hours-Care
- vacation care
- multifunctional Aboriginal children's services
- mobile childcare services
- Family Day Care services.

Childcare services requiring support for the inclusion of children from culturally and linguistically diverse backgrounds, including refugee children, can contact the West or South East offices.

Childcare services requiring support for the inclusion of children with additional needs, including disabilities, can contact the North, South or South East offices:

- North Office
  Telephone 8165 2900, Fax 8165 2911, Email info@directions.org.au

- South East Office
  Telephone 8725 0211, Fax 8725 0216, Email southeast@directions.org.au

- South Office
  Telephone 8358 2299, Fax 8358 2199, Email info@directions.org.au

For more information visit the Inclusive Directions website at www.divdir.asn.au

Special Education Resource Unit (SERU)
SERU is a Department of Education and Children's Services facility that offers a statewide professional service for teachers, other professionals and families who support children and students with a disability and learning difficulties. The unit houses a range of resources (including developmental/curriculum resources, teacher reference materials, specialised/adapted resources and assessment materials) and provides curriculum access through information technology and specialised equipment. A variety of assistive and adaptive hardware and software to support curriculum access is available through negotiated loan. In addition, SERU offers a diverse range of equipment to facilitate access to educational sites. This includes specialised chairs, change tables, hoists, slings, toileting equipment, portable ramps, sloping desks and adjustable tables. Telephone 8235 2871 or visit the website at <web.seru.sa.edu.au/>. (SERU is based in Adelaide.)

Other

Interpreting services
- *ABC International*, telephone 8364 5255
- *Interpreting and Translating Centre*, telephone 8226 1990
- *DeafSA*, telephone 8223 3335
- *Translating and Interpreting Service (TIS)* (a 24-hour service), telephone 13 1450
- *Translation Consultants International*, telephone 8342 5200

Centacare
Centacare provides counselling and other family support services. Telephone 8210 8200, or in SA country areas Freecall 1800 812 300. Website is at <www.centacare.org.au>. (Centacare is based in Adelaide with offices in Elizabeth, Mount Gambier, Murray Bridge, Salisbury and Woodcroft.)

Glossary

Aboriginal and Torres Strait Islander person
An Aboriginal or Torres Strait Islander person is someone of Aboriginal or Torres Strait Islander descent who identifies as an Aboriginal person or Torres Strait Islander and is accepted as such by the community in which he or she lives.

Acute otitis media
Presence of fluid behind the eardrum plus at least one of the following: bulging eardrum, red eardrum, recent discharge of pus, fever, ear pain or irritability. Bulging eardrum, recent discharge of pus, and ear pain are the most reliable indicators of acute otitis media.

Amplification devices
Any device that amplifies sound; for example, hearing aids or classroom systems.

Audiologist
(Definition below is from the Australian Government's Department of Health and Ageing website at <www.health.gov.au/internet/wcms/publishing.nsf/content/health-hear-client3.htm#Audio>)

Qualified audiologists are university graduates with post-graduate qualifications in audiology or equivalent training. A minimum of twelve months' supervised clinical practice in audiology is also required. Audiologists have broad responsibilities and expertise in all non-medical areas of hearing services, including complex hearing assessment and rehabilitation of hearing impairment (which includes hearing aid prescription, fitting and management).

Audiometer
An audiometer is the machine that is used to measure hearing. The audiometer produces sounds of a measured frequency (Hz) and intensity (dB).

Audiometrist
(Definition below is from the Australian Government's Department of Health and Ageing website at <www.health.gov.au/internet/wcms/publishing.nsf/content/health-hear-client3.htm#Audio>)

Qualified audiometrists have completed a certificate course in hearing aid audiometry and/or received in-house training from the hearing aid industry. They have a minimum of three years' experience in hearing assessment, hearing aid prescription and fitting, and management of hearing loss.

Audiometry
Audiometry is the measurement of hearing using calibrated, electronic instruments.

Breathe, Blow, Cough routine
The Breathe, Blow, Cough (BBC) routine or program is a preventative program to teach children how to blow their noses and clear the Eustachian tube. It was developed by a physiotherapist from Alice Springs.

Comprehensive primary health care
Comprehensive primary health care services provide a range of services to the community, including clinical services, policy and program management, substance misuse, sexual health, mental health, community development and population health programs—all with a focus on nutrition and lifestyle factors.

Conductive hearing loss
Conductive hearing loss occurs when sound is not conducted efficiently through the outer ear canal to the eardrum and the tiny bones, or ossicles, of the middle ear. Conductive hearing loss usually involves a reduction in sound level or the ability to hear faint sounds.

Conductive hearing loss is caused by otitis media, osteosclerosis, cholesteatoma, wax blockage and swimmer's ear.

Chronic suppurative otitis media
Persistent discharge of pus through a perforation (hole) in the eardrum for at least six weeks despite appropriate treatment for acute otitis media with perforation.

Ear, nose and throat (ENT) specialist
Medical specialist specialising in medical conditions of the ear, nose and throat.

Ear toilet (also known as aural toilet)
1. The medical practice of an ear toilet is the cleaning of pus and debris from the ear canal in a discharging ear, before applying ear drops.
2. The practice of preventative measures such as dry mopping with tissues or the Breathe, Blow, Cough routine.

Early intervention
An early intervention is an action taken as soon as possible to stop the harm that the problem is causing or will cause.

Guthrie test
The Guthrie test is a medical test performed on newborn infants to detect phenylketonuria, an inborn error of amino acid metabolism.

Kendall Toy Test (1954)
A speech discrimination test to be used with toddlers from two to three years old. The test aims to find how loud speech needs to be for a child to hear vowels and consonants, and involves the child identifying, on request, one of a set of toys.

Mainstream health service
Means health and health related services that are available to, and accessed by, the general community.

National Hearing Strategy
National Aboriginal and Torres Strait Islander Hearing Strategy 1995–1999 (Department of Human Services and Health 1995).

Otitis media
Refers to all forms of inflammation and infection of the middle ear.

Otoscope
Instrument used for the visual inspection of the ear.

Otoscopy
The use of an otoscope to examine the eardrum and ear canal.

Primary health care
Primary health care is generally understood as the health care that is available to members of the general community in their local area. It is the first point of contact between the community and the health care system. Primary health care includes general practitioners, community and bush nursing and the Royal Flying Doctor Service, together with community health, dental health and Aboriginal and Torres Strait Islander health care services. It may also include outpatient services provided by a general hospital. Primary health care services provide clinical and community health care, and play a gatekeeper role in facilitating access to specialist health services.

Aboriginal and Torres Strait Islander community controlled health services operate primary health care according to the working definition of primary health care as defined in the 1989 National Aboriginal Health Strategy (National Health Strategy Working Party 1989).

It is essential health care based on practical, scientifically sound, and socially and culturally acceptable methods and technology made universally accessible to individuals and families in the communities in which they live through their full participation at every stage of development in the spirit of self-reliance and self-determination.

Primary Health Care Access Program (PHCAP)
The Primary Health Care Access Program (PHCAP) is an Australian Government program that supports the continuation of services established through the Coordinated Care Trials. PHCAP also provides for increased primary care services in Aboriginal and Torres Strait Islander communities identified as having the highest relative need and capacity to utilise funding through a completed regional planning process, agreed between the Aboriginal and Torres Strait Islander Commission, Aboriginal Community Controlled Health Organisations and Commonwealth, state and territory governments. Funding is provided on a per capita basis to levels more commensurate with the health needs of these regions and takes into account the extra costs involved in providing health services in remote areas. Capacity development is an important part of the overall program.

Sensorineural
This is hearing loss due to cochlear (sensory) or neural nerve dysfunction.

Sound field amplification
Amplification of sound into an open space (as opposed to an enclosed space such as the ear canal). This system can be used in classroom situations.

Signal-to-noise ratio

(Definition below is from *Sound design for educational facilities* by Eddie Duncan, ASA, Resource Systems Group, Inc; accessed at <www.rsginc.com/pdf/Sound_Designs_for_Educational_Facilities.pdf#search=%22sound%20noise%20ratio%22>)

The signal-to-noise ratio is the difference in sound levels between the sound you want to hear (the signal) and the background noise (the noise). For children, the signal-to-noise ratio must be 10 dB or more. For hearing impaired listeners, the ratio should be around 15 dB or more.

TTY
TTY is a text telephone used by a person who is Deaf or hearing impaired.

Tympanometer
The machine used to measure the movement of the middle ear system.

Tympanometry
Tympanometry is the test of middle ear function. It measures the movement of the middle ear system. Tympanometry can be used on children older than six months of age. The ear canal for younger infants is too elastic.

Video otoscopy
An otoscope with the additional feature of the image being transferred to a screen for easier viewing.

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