Deadly Ears Deadly Kids Deadly Communities Framework

EVALUATION REPORT

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List of abbreviations

ABS  Australian Bureau of Statistics
AMS  Aboriginal medical services
AHMAC  Australian Health Ministers’ Advisory Council
AI  Appreciative inquiry
AICCHSs  Aboriginal and Islander Community Controlled Health Services
AOM  Acute otitis media
AVT-HI  Advisory Visiting Teachers – Hearing Impairment (regional level position)
CDC  Centres for Disease Control and Prevention
COAG  Coalition of Australian Governments
COM  Chronic otitis media
CoP  Community of Practice
CSOM  Chronic suppurative otitis media
DEDKDC Framework  Deadly Ears, Deadly Kids, Deadly Communities Framework (2009–13)
DETE  Department of Education, Training and Employment
DSSU  Disability Services Support Unit
EATSIPEC  Embedding Aboriginal and Torres Strait Islander Perspectives into Early Childhood
ECEC  Early childhood education and care
ENT  Ear nose and throat
EQ  Education Queensland
HHS  Hospital and Health Service
HI  Hearing impairment
HPF  Aboriginal and Torres Strait Islander Health Performance Framework
ISSU  Indigenous Schooling Support Unit
LIP  Local implementation plan
MBS 715  Medicare Benefits Schedule No. 715; Annual health check for Aboriginal and Torres Strait Islander people of all ages
MOU  Memorandum of Understanding
NACCHO  National Aboriginal Controlled Community Health Organisation
NIRA  National Indigenous Reform Agenda
NPA CtG IHO  National Partnership Agreement Closing the Gap-Indigenous Health Outcomes
NPA IECD  National Partnership Agreement Indigenous Early Childhood Development
NPHA  National Health Performance Authority
NQF  National Quality Framework
OATSIH  Office of Aboriginal and Torres Strait Islander Health
OM  Otitis media
OME  Otitis media with effusion, also known as ‘glue ear’
PA  Participatory appraisal
PHU  Preventative Health Unit
QAIHC  Queensland Aboriginal and Islander Health Council
RAIS  Remote Area Incentive Scheme
RATEP  Remote Area Teacher Education Program
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>RCCG</td>
<td>Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations</td>
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<tr>
<td>RFDS</td>
<td>Royal Flying Doctors Service</td>
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<tr>
<td>ROC</td>
<td>Regional Operations Centre</td>
</tr>
<tr>
<td>ROM</td>
<td>Recurrent otitis media</td>
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<tr>
<td>SAS</td>
<td>Sound field amplification system</td>
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<tr>
<td>SEP</td>
<td>Special education program</td>
</tr>
<tr>
<td>SET</td>
<td>Special education teacher</td>
</tr>
<tr>
<td>STC</td>
<td>Save the Children</td>
</tr>
<tr>
<td>STLD</td>
<td>Support teacher learning disabilities</td>
</tr>
<tr>
<td>TM</td>
<td>Tympanic membrane</td>
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<td>URTI</td>
<td>Upper respiratory tract infection</td>
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Executive summary

The Deadly Ears Deadly Kids Deadly Communities (DEDKDC) Framework was initiated in 2009, and was aligned to the Queensland government’s whole of government close the gap plan, “Making tracks: a state-wide plan towards addressing the gap in health outcomes for Indigenous Queenslanders 2009–2013”. The Framework targets a reduction in the significant rates of otitis media (OM) in Aboriginal and Torres Strait Islander children. OM is the result of an interaction between medical and environmental causes. As such, the Framework aims to reduce both the incidence and impact of conductive hearing loss associated with OM by intervening at a number of different levels, from the local to the national, and across different sectors.

The purpose of this evaluation was to evaluate the effectiveness of the Framework in relation to three broad areas:

1. The extent to which the incidence and impact of chronic suppurative OM (CSOM) is reduced in Aboriginal and Torres Strait Islander children
2. The extent to which the Framework has enhanced the coordination, integration and delivery of health and education services that support Aboriginal and Torres Strait Islander children experiencing OM and associated conductive hearing loss
3. The extent to which the Framework has enabled the inclusion of information on OM and conductive hearing loss among Aboriginal and Torres Strait Islander children in policy and service planning for health and education.

The evaluation has drawn on program documentation, an online survey of DEDKDC Steering Committee members, and interviews with key stakeholders, including Steering Committee members, Deadly Ears program staff and community members. Two Deadly Ears partner communities were visited, in order to ensure that service level experiences were incorporated and reflected in the overall findings.

Key findings

The evaluation has found that the Framework has delivered a number of significant outputs contributing to its overall objectives.

Deadly Ears Clinic data has shown reductions in presentations of CSOM in both 0-4 and 5-14 year olds from 2009-2013, and that there was a reduction in presentations of CSOM in all children from 2009–10 to 2013–14, following health promotion and education activities in
2010. An accurate assessment of the overall reduction in the incidence of CSOM was not possible, due to the lack of population level data.

Substantial progress has been made against the achievements for Key Action Area 1 (Prevention). Achievements of note include: training related to nutrition, physical activity and tobacco; engagement with early childhood education, schools and the tertiary education sector; health promotion activities and social marketing campaigns targeting Aboriginal and Torres Strait Islander Queenslanders; engagement and material development with maternal and child health workers in Deadly Ears program partner communities.

The activities conducted under Key Action Area 2 (Screening, Surveillance and Diagnosis) have enabled progressive steps to be taken in achieving the objectives set out under this Key Action Area. Important documents that the Steering Committee have been able to influence include: the Primary Clinical Care Manual (PCCM), the Personal Health Record (the Red Book), the Queensland Chronic Disease Guidelines: Child Health Check, and the Child and Youth Practice Manual. An increased proportion of families and children are now successfully navigating the referral system and seeing an ear/hearing specialist. In addition, more communities have access to appropriate screening equipment.

Significant progress towards Key Action Area 3 (Treatment and Support) has been demonstrated. Particularly important have been the development and dissemination of the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations (2010), and their promotion by the Australian Medicare Local Alliance (AML). Training and the ENT services have also been especially relevant to the achievement of the objectives of this Key Action Area. In terms of support, sound field amplification systems (SASs) have been distributed to the regions, and kindergarten services have free access to functioning SAS. In addition, the recommendations of the Deadly Ears Program team to improve the acoustic design of kindergarten buildings, and support in the use of SAS, have been accepted and included in the planning specifications.

Under Key Action Area 4 (Partnerships) all Deadly Ears partner communities, and their jurisdictions, were covered by memorandums of understanding (MOU) for the duration of the Framework. Other examples of collaboration were training and developing materials, although these were mainly undertaken by the Deadly Ears program in partner communities.
The activities and outputs reported against **Key Action Area 5 (Workforce Development)** suggest progress has been made towards achieving the objectives for this key indicator. Activities recorded in the Annual Report include the development of the aforementioned Guidelines, and some training initiatives with early years staff, school level educators and the tertiary sector. An important achievement has been the ongoing collaboration between the Deadly Ears Program and the Qld Department of Education, Training and Employment (DETE) to incorporate ear and hearing health, and teaching strategies for children with hearing impairment, into RAIS Conferences.

The main achievement against **Key Action Area 6 (Information and Knowledge)** reported in the Annual Report (2013-2014) was a Model of Care for an integrated service developed by the Deadly Ears Program and the Southern Queensland Aboriginal and Torres Strait Islander Ear Health Program.

**Recommendations**

The evaluation has outlined five overarching recommendations, and six recommendations in relation to the six Key Action Areas (KAAs). A strong focus has been placed on identifying service planning opportunities, measurement parameters and structures that will assist ongoing service delivery, monitoring and evaluation. See section 5.0 for detailed recommendations.

The recommendations are provided under the following overarching areas:

- Service Planning
- Steering Committee Membership
- Governance Structure
- Memorandums of Understanding
- Program theory

These recommendations build on current arrangements and approaches to strengthen cross organisational and multi-level communication and interaction, stakeholder engagement at all levels of the system, aligning objectives and leadership at all levels of the system, and providing feedback to service providers.

Recommendations are also provided under each of the existing KAAs: Prevention (KAA 1), Surveillance and Diagnosis (KAA 2), Treatment, Care and Support (KAA 3), Partnerships (KAA 4), Workforce Development (KAA5) and Information and Knowledge (KAA 6).
The evaluation recommends some updates to the wording of the existing KAAs to reflect greater emphasis on the social determinants of health and suggests developing a program theory and a hierarchy of outcomes in order to allow better measurement and a stronger evidence base to plausibly link outcomes to activities. The evaluation also recommends advocating for a (ear) Health in All Policies (HiAP). This does not mean that ear and hearing health should be at the centre of all policies, but underscores the need for cross-sector collaboration. The formation of the Steering Committee has changed over time and the evaluation also makes recommendations on the structure and composition of the Steering Committee.

Specifically, suggestions for refocusing of objectives under the KAAs are provided, along with example outcomes, intermediate outcomes, outputs and activities. The Framework and the evaluation recognises that simple, stand-alone solutions are unlikely, on their own, to generate substantial gains in reducing the impacts of OM and associated conductive hearing loss. This is because OM, and its determinants, are complex and need actions and behavioural changes at different levels of the system in which Aboriginal and Torres Strait Islander children live, play and grow.

As with other complex issues, reducing the prevalence of OM is a long-term endeavour that requires a system thinking approach and increased awareness of the need for a Health in All Policies (HiAP) approach, in order to improve ear and hearing health, as well as health more generally. Given the lifelong impacts of OM, continuing to facilitate a cross-sectoral, multi-strategy approach to the prevention, treatment and management of OM is critical.
1.0 Background

The Deadly Ears Deadly Kids Deadly Communities (DEDKDC) Framework (hereafter called the ‘Framework’) was initiated in 2009, and was articulated as an important component of the Queensland Government’s commitment to ‘close the gap’, which was described in ‘Making tracks: a State-wide plan towards addressing the gap in health outcomes for Indigenous Queenslanders 2009–2013’ (1). The Framework targeted a reduction in the significant rates of chronic suppurative Otitis Media (CSOM) in Aboriginal and Torres Strait Islander children.

Otitis media (OM) is a general medical term used for inflammation of the middle ear, and is the result of an interaction between medical and environmental causes. Consequently, as an intervention, the Framework is complex, aiming to reduce both the incidence and the impact of conductive hearing loss associated with OM, by intervening at a number of different levels, from local to national, and across different sectors. Influencing systems and broader environmental challenges to achieving good ear health is a long, complex and multi-step process. The process of achieving system level change, therefore, tends to be incremental and cyclical, involving continual modification of planned approaches and development of different strategies to influence different sectors. Working to achieve this level of change, the Framework is underpinned by the nine principles of the National Strategic Framework for Aboriginal and Torres Strait Islander Health 2003–2013 (2) and the Cultural Respect Framework for Aboriginal and Torres Strait Islander Health 2004–2009 (3). Furthermore, the Framework is guided by a number of other assumptions and principles: evidence-based policy and practice; community engagement and health promotion; access to primary healthcare; access to mainstream services and taking a population-based approach (4).

This complex issue was examined in the evaluation; reflecting the principles underpinning the Framework, a public health context was used for the evaluation. It has examined the strategies being incorporated under the Framework across the continuum, from those addressing the environmental and social determinants of OM, to those related to the management of OM. The evaluation took a utilisation-focused approach, continuously engaging with the key users (5) in order to assist in identifying appropriate strategies for the next Framework, together with an approach that recognised the complexities of achieving system level change.

A number of data sources and methods were used, as well as working with end-users to generate information relating to:

   a. the Steering Committee’s activities under the Framework;
b. defining service planning opportunities and measurement parameters/structures that will assist on-going service delivery, monitoring and evaluation;

c. process aspects of the Steering Committee and the Framework.

To evaluate the impact of the Framework, the following parameters were used showing the extent to which:

- the incidence and impact of CSOM is reduced in Aboriginal and Torres Strait Islander children;
- the Framework has enhanced the coordination, integration and delivery of health and education services that support Aboriginal and Torres Strait Islander children experiencing OM and associated conductive hearing loss;
- the Framework has enabled the inclusion of information on OM and conductive hearing loss among Aboriginal and Torres Strait Islander children in policy and service planning for health and education.

The remainder of this report summarises the key literature reviewed as part of this evaluation, before outlining the methods, the findings and recommendations. The literature reviewed in the following section encompasses both clinical and public health perspectives that contributed to the evaluation that followed.

1.1 Literature

**Otitis media and associated conductive hearing loss**

OM is the general medical term for inflammation of the middle ear. The hearing impairment associated with OM generally fluctuates in nature, and is mild to moderate in degree (4). In Aboriginal and Torres Strait Islander children, OM often begins within weeks of birth, has repeated episodes, and can persist into adolescence (6, 7, 8).

In comparison with the Australian community generally, Aboriginal and Torres Strait Islander peoples experience disproportionately higher levels of hearing impairment and deafness due to OM (7, 9-11). Up to 40% of Aboriginal and Torres Strait Islander children in remote areas suffer from a chronic form of OM—CSOM (10,12). The World Health Organisation states that a prevalence of CSOM of greater than 4% is a major public health problem (10, 12). In the worst affected communities, it has been found that perforation of the tympanic membrane (TM) may affect more than 50% of children, a rate which has not been described consistently in any other part of the world (7). This is a persistent and on-going problem despite public health measures over the last 30 years (11). A study of the state of the middle
ear of young Aboriginal children (6–30 months) from a range of remote populations in northern and central Australia found that the rates of OM (all types), TM perforation, and suppurative OM were all extremely high (7) when compared with the only previous large scale survey of children in this age group (13). One in every two children was found to have otoscopic signs consistent with CSOM, and one in four children had a perforated TM. They also found that only 20% of children were likely to have normal hearing and did not require medical or audiological treatment, and that there was considerable variation in the prevalence of perforation of the TM and suppurative OM between populations; although the reason for the latter was not obvious (7). It has been found, however, that when living conditions are similar between Aboriginal and Torres Strait Islander people and non-Indigenous people, the patterns of OM are more similar (4).

Assessing children for OM and hearing loss initially involves screening to assess if there are any concerns with the children’s ears and hearing that would warrant further assessment. Screening usually involves a visual assessment of the outer ear, canal and TM (otoscopy), assessment of middle ear function (tympanometry), and a quick hearing test to identify children ‘at risk’ of hearing problems and who require further assessment (audiometry). Children who have had an ear or hearing concern identified by a trained screener should be referred to a medical practitioner for further assessment and treatment, and for further hearing testing if there is evidence of hearing loss. National guidelines recommend antibiotic therapy for Aboriginal and Torres Strait Islander children with acute otitis media (AOM) (14, 15, 16). Where surgical interventions are indicated, children are referred to an ear nose and throat (ENT) specialist.

Complications of otitis media and associated conductive hearing loss

OM has significant implications for education, employment and socio-economic status of Aboriginal and Torres Strait Islander peoples and, therefore, cannot be viewed simply as a health problem (4, 9, 17). The complex interaction of multiple risk factors also means that action is needed across multiple sectors, addressing the environmental and social dimensions affecting the development of OM and its impacts.

A crucial phase of language development occurs between birth and the age of three years, and any hearing loss during this time potentially leads to delays in language development (18). Several studies have identified a link between hearing impairment and poor progress in education (18), and poor hearing has been associated with poor literacy levels among Aboriginal children (18,19). The areas of cognition most likely to be affected by the hearing loss associated with OM are auditory processing skills, attention, behaviour, speech and
language (17). Literacy levels have been shown to be restored in some children when hearing is restored; however, others will continue to have long-term educational difficulties (18, 19, 20). Children with hearing problems have been found to exhibit behavioural problems when they do not understand what is going on around them, as well as being at risk of developing mental health disorders (21). Other studies have, however, concluded that there is no definitive evidence to suggest that OM affects behaviour and attention (17, 22). Aboriginal and Torres Strait Islander children who are learning English as a second language, typically those living in remote areas, are likely to face even greater educational difficulties (17, 23). Furthermore, a large survey of Aboriginal children’s health in Western Australia found that children who had experienced recurrent OM with discharge were more likely to have a hearing difficulty, and difficulties with speech, language and learning (17, 24). Access to amplification, communication training, and psychosocial support is, therefore, required, together with attention to building design to reduce physical barriers to hearing (21).

In a study undertaken with Northern Territory correctional centres, hearing test results indicated an alarming prevalence of hearing loss amongst Aboriginal inmates—a prevalence higher than that of the general Aboriginal population (25). As hearing loss is known to be associated with poor educational outcomes and unemployment, which in turn are associated with higher rates of involvement in the criminal justice system (26), it is possible that hearing loss may be indirectly contributing to people’s involvement in the criminal justice system (25).

Risk factors

Whilst being largely preventable and treatable, there are multiple risk factors for the development of OM which, as noted, makes this a complex issue to address, and the collective effect large. Lack of access to appropriate health services will, however, mean that diagnosis and treatment will not occur (27).

The direct risk of OM is associated with the early age of nasopharyngeal colonisation with three principal bacterial respiratory pathogens (28). A balance between exposure and immune protection affects the primary acquisition of these bacteria (28). Antibiotic treatments and Haemophilus influenza type b (Hib) vaccination can help reduce the number of OM episodes (8). As pneumococcal vaccination has the potential to prevent OM in Aboriginal and Torres Strait Islander children (8, 29, 30, 31), the Australian Government administers pneumococcal vaccination programs for this cohort of the population (8).
Looking at the indirect risk factors for OM, the high prevalence of OM among Aboriginal and Torres Strait Islander children has been found to be closely tied to the broader socio-economic disadvantages commonly experienced in Aboriginal and Torres Strait Islander populations (27). Poverty can limit the capacity of families to maintain healthy and hygienic environments, particularly in terms of housing and diet, which in turn places family members, especially children and youth, at increased risk of disease (27). Passive smoking, premature birth, bottle feeding and malnutrition also play a role in the development, recurrence and persistence of OM (8, 32, 33).

Exposure to respiratory bacterial pathogens is driven by overcrowding, poor quality housing and inadequate washing facilities in remote Aboriginal and Torres Strait Islander populations (11, 28, 34). In the first weeks of life, acquired respiratory bacteria is likely through exposure to heavily colonised young siblings, often with rhinorrhea (runny noses), and mothers. A study demonstrated 83% of swabs from siblings and 41% from mothers were positive for Streptococcus pneumoniae (28, 35). Upper respiratory tract infection (URTI), which includes the presence of cough or rhinorrhea or sore throat, has been indicated in a meta-analysis as a significant prognostic factor for both chronic and recurrent OM (36). Inadequate access to clean water, houses without working taps and showers, and lack of functional sewerage systems make living with good hygiene very difficult, and increase the exposure of children to bacteria that leads to OM (37, 38).

Bottle-feeding infants is one of the key nutritional factors associated with increased risk of OM. Epidemiological studies indicate that infant formula in the first six months of life is associated with increased risk of OM, when compared with six months of exclusive breastfeeding (39). Duration of exclusive breastfeeding, including specifically in the second six months of life, has also been found to significantly reduce the number of acute OM episodes (40, 41). The positive effect of breastfeeding has been found to be independent of the other potential risk factors considered, such as passive smoke exposure or use of day care (40). Breastfeeding also appears to confer longer term protection, well beyond infancy (42). Some caution is needed, however, in interpreting results, as there is a lack of standardised and precise definitions of infant feeding practices, including consideration of the differences that may occur when duration of exclusive or partial breastfeeding is included (39). Other nutritional factors are poor diet and consequent malnutrition, resulting from poor access to affordable fresh food which can contribute to lower immunity levels, making children more susceptible to infection (27, 43).

Exposure to environmental smoke and passive smoking has consistently been shown to be a significant risk factor for OM in children; therefore, a smoke-free environment will help
reduce the burden of OM (11, 44). Exposure to environmental tobacco smoke increases the risk of OM 1.6 fold, and reducing exposure to tobacco smoke could reduce the risk of OM by up to 27% (45). The proportion of Aboriginal and Torres Strait Islander households with children where there are resident smokers, however, appears to be declining. In 2004–05, more than one out of four Aboriginal and Torres Strait Islander households had at least one resident who regularly smoked indoors (9,46); in 2007–08, the figure was 25% lower (8,9). There has also been an 8% decline in daily tobacco smoking by Aboriginal and Torres Strait Islander peoples between 2002 and 2012–13 (47), indicating that the proportion of Aboriginal and Torres Strait Islander children exposed to tobacco smoke is likely to have continued to decline (8). However, there remain significant improvements to be made; smoking cessation programs, such as those to assist pregnant women to stop smoking and hospital-based quit programs, whilst being shown to be effective in the mainstream population, have not been evaluated in relation to their effectiveness for Aboriginal and Torres Strait Islander people (48).

Time spent at day care has been shown to increase the risk of carriage of respiratory bacteria (34); however, it has also been found that attending childcare reduced the risk of OM among those children exposed to passive smoking, presumably because children who attend childcare spend less time among people smoking in the home environment (34, 44). A recent meta-analysis, however, found no association between attendance at day care centres and either chronic or recurrent OM (36). Nevertheless, more effort is urgently needed to improve early development and educational outcomes for Aboriginal and Torres Strait Islander children. The positive benefits of attending childcare, however, need to be counterbalanced by the potentially detrimental effects of the higher prevalence of bacterial colonisation, which may result from day care attendance (34). This highlights the importance of working with the early years’ sector and day care facilities. Furthermore, the National Quality Framework (NQF) established in 2012 (49), which applies to all long day care, family day care, preschool/kindergarten and outside-school hours care services, includes health and hygiene requirements that should help to minimise excessive exposure to infections.

**Screening and surveillance**

Population-based screening, as a sole strategy, has not been found to reduce the prevalence of OM among Aboriginal and Torres Strait Islander children (8). Additionally, routine child health checks, that incorporate ear and hearing assessments, allow for early identification, management, treatment and, if necessary, fitting of hearing aids (8). An evaluation of the former screening-focused approach, the NSW OM Screening Program (2004–08), found the program did not address social and environmental factors contributing
to OM, was unsupported by evidence, was cost-prohibitive and did not reduce prevalence (50). Instead, the most recent NSW Aboriginal Ear Health Program Guidelines 2011–15 have a strong preventative approach through better education for parents, carers, extended families, health and education professionals. The Guidelines aim to reduce the prevalence of OM by:

- addressing environmental health risk factors;
- reducing maternal ante-natal smoking;
- increasing maternal post-natal breastfeeding;
- improving safe and healthy housing conditions;
- linking with existing child health surveillance programs;
- improving awareness and education among the Aboriginal and Torres Strait Islander peoples and human services professionals (50, 51).

Surveillance is the on-going systematic collection, analysis and interpretation of data to monitor trends in outcomes, and to identify underlying risk and causal factors (52). Prevention of disease, especially those with multiple causes such as OM, requires the collection of surveillance data (8). There is currently no national population-based surveillance program to monitor OM and associated hearing problems in Aboriginal and Torres Strait Islander children. However, an effective strategy can be built around regular, opportunistic, child health checks (8, 53). The Closing the Gap report on OM in Aboriginal and Torres Strait Islander children noted that, given the multifactorial nature of OM, a mixed surveillance approach tracking both the acute and chronic aspects of the disease would be useful (8).

Data

A strategic approach to the collation and reporting of accurate data on rates of OM and conductive hearing loss in Aboriginal and Torres Strait Islander populations in Queensland is required. This must be underpinned by a nationally consistent approach to data collection and data parameters.

Strategies for working with complex health issues

As demonstrated above, OM and associated conductive hearing loss in Aboriginal and Torres Strait Islander populations presents a complex issue. The following section presents some of the key public health ideas that have informed this evaluation and its recommendations.
**Socioecological model — describing the complexity of causal pathways**

A socioecological model offers a framework that takes into account the reciprocal interaction of individual behaviours and the environment. In the context of ear health, it recognises that OM is not only influenced by individuals, but also by the larger ecology of their lives. The inter-relationships between an individual’s personal dimensions (e.g. biomedical, attitudinal, and behavioural) with the multiple components of an individual’s life context (e.g. social, organisational, community, public policy, and physical environments) are examined (54, 55, 56). The current Deadly Ears Deadly Kids Deadly Communities (DEDKDC) Framework (4 pp.13-14) recognises that OM cannot be viewed only as a health issue, due to its significant implications for education, employment and socioeconomic states of Aboriginal and Torres Strait Islander peoples (4). Additionally, in devising a coordinated response to OM and associated conductive hearing loss, a multi-sector, multi-level, multi-strategy response is required. The socioecological model is illustrated in Figure 1 below.

**Figure 1 The Socioecological Model for Public Health**

![Figure 1 The Socioecological Model for Public Health](image)

**Taking a systems approach to system change**

It is increasingly recognised that complex public health problems require new and innovative ways of thinking and working. Two inter-linked strategies have been proposed: 1) partnerships based on shared values; and 2) systems thinking. This approach is underpinned by:
• shared values;
• systems thinking;
• leadership;
• governance;
• learning networks;
• evaluation, research and feedback loops (57).

Systems thinking is, foremost, a mindset that views systems and their sub-components as intimately inter-related and connected to each other, believing that mastering our understanding of how things work lies in interpreting inter-relationships and interactions within and between systems. It embraces the understanding of open systems as complex adaptive systems that are constantly changing, counter-intuitive, non-linear, and where the whole is greater than the sum of its parts (58, 59).

The World Health Organisation outlines that a health system consists of all organisations, people and actions whose primary interest is to promote, restore or maintain health (60). This can be analysed in its totality by using different groups or blocks (Figure 2).

**Figure 2 The WHO Health Systems Framework (60)**

![WHO Health Systems Framework](image)

A systems approach extends the socioecological approaches by drawing attention to the inter-relationships within and across the different levels of a system, taking these into account in program design and implementation. This requires a blending of individual shared practice; organisational partnerships; legislative and regulatory alignment; stakeholder engagement, including participation of those affected; and shared accountability and credit. It is about being aware of the relationships between the pieces of a system and how they change when a single piece is altered (61). The Deadly Ears Program’s Model of Care (62), which sits under the Framework, is an example which recognises the need to “encompass a
whole system design”; “integrate care across disciplines, sectors and organisations”. In this context, the ‘systems’ relate specifically to the education and health systems within which the Deadly Ears Framework works. It includes aspects of service delivery, health workforce, equipment, governance and research.

It has been suggested that a comprehensive systems perspective should guide health practice, education, research and policy, with key ‘systems thinking’ tools and strategies having the potential for transformational change in health systems (63). Three overarching themes span these tools and strategies: collaboration across disciplines, sectors and organisations; on-going, iterative learning and feedback loops; and transformational leadership (63). Health in All Policies (HiAP) is a type of large-scale inter-sectoral action that takes a systems approach to improve health through attention to the full range of determinants. Developing new structures, processes and tools, however, to break down the siloed approach challenges both political and public service leaders to rise above their own interests, and consider shared goals and commit to steps for reaching them (64).

Building on this approach in public health, it has been suggested that there is now a fifth wave of public health emerging, which differs radically from its forerunners and embraces systems thinking. The qualities include:

- the recognition that public health is dealing with complex adaptive systems as discussed;
- that greater inter-dependence and cooperation is required;
- the need to iterate and scale up through learning, a process where we try things out, learn and share this learning (65).

Drawing on the review of the socioecological framework by Willows and colleagues (56), an ecological systems approach which embraces systems thinking can be applied to addressing ear health in Aboriginal and Torres Strait Islander children. It will require action across government departments and, to be supported, will require educating the broader public and university researchers on the historical processes that act, to this day, on the Aboriginal and Torres Strait Islander population. From an ecological perspective, understanding ear health, as it relates to Aboriginal and Torres Strait Islander populations, requires attending directly to not only lifestyles and risk factors implicated in the development of OM, but also, for some, the unique social and historical context underpinning these contemporary experiences.

Finally, in order to increase the role and value of networks in health systems, it will need to be determined how network performance should be measured in ways that promote broad
stakeholder learning; and, secondly, how these measures can be built into appropriate accountability structures in order to strengthen network and health system performance (66). It will be essential for accountability and feedback structures to be built collaboratively, so that decisions concerning the design, content and interpretation of feedback structures are developed with input from all stakeholders (66). The need to involve stakeholders (including potential data users) is particularly important in monitoring the performance of networks, where collaborative and often non-hierarchical structures create challenges for traditional ‘top-down’ performance measurement strategies. Determining how, by whom and when co-developed metrics should be used to drive performance require careful, collaborative planning to determine the linkages between data, decisions and actions (66, 67).

**Stakeholder engagement**

Stakeholder engagement at all levels of the system is a cornerstone of systems thinking for health. Stakeholders are diverse and include government bodies, health services, community-based organisations, professional associations, the private sector, academics and, importantly, affected communities and individuals. Conventional approaches to health promotion and community engagement generally focus on individual risk factors, often ignoring a more holistic perspective, which focus on community strength and resilience (68,69). The current Framework, underpinned by the *National Strategic Framework for Aboriginal and Torres Strait Islander Health 2003-2013* (2), and the *Cultural Respect Framework for Aboriginal and Torres Strait Islander Health 2004-2009* (3), recognises that there should be community engagement in health promotion, and that “approaches and strategies are aimed to improve health, social and economic outcomes for the individual, family and community” (4).

There are a number of methods that can be used when taking a strength-based approach, including asset mapping as a "process of building an inventory of the strengths and gifts of the people who make up a community and highlights the interconnections among them"; appreciative inquiry (AI); and participatory approaches to collaborative research. These can contribute to co-production, whereby decision-makers and citizens, or service providers and users, work together to create a decision or a service that works for them all. The approach is value-driven and built on the principle that those who are affected by a service are best placed to help design it. The benefits of co-production are that it builds skills and confidence amongst people who use services. It also ensures services are appropriate and utilised with more effectiveness, and is consistent with a systems approach (70,71).
Looking specifically to the Aboriginal and Torres Strait Islander populations, public health research and health promotion should be framed by the principles of Aboriginal and Torres Strait Islander self-determination and community control and, ideally, be initiated by the community and be accountable to the community (69). Culturally-appropriate approaches are required for successful health promotion in Aboriginal and Torres Strait Islander populations, together with recognising the heterogeneity of different populations, with the specifics of any program likely to be contingent on the social and cultural context of those involved (72).

The most valuable resource for promoting participation in Aboriginal and Torres Strait Islander health programs comes from the people already in those populations (73), and the recognition that central to Aboriginal and Torres Strait Islander peoples’ view of health is the concept of the individual as one part of the family and whole community (68,74). Historical factors continue to influence how Aboriginal and Torres Strait Islander people engage with mainstream services, and some government health services may be anxiety producing. Mainstream health services, therefore, would benefit from fostering environments that encourage informal interactions that facilitate learning and support in a relaxed atmosphere (74).

**Resources for the prevention of otitis media**

Since the 1970s, the high prevalence of OM in Aboriginal and Torres Strait Islander populations has been recognised; although not identified as a major concern in policy documents until the late 1980s in the National Aboriginal Health Strategy (NAHS) (8). Since this time, there have been further strategies and resources committed. The National Strategic Framework for Aboriginal and Torres Strait Islander Health 2003–2013 highlighted the need to respond to hearing loss in accordance with the NAHS priorities, and developed a focus on children at educational risk due to this impairment (8).

A number of past and current initiatives have aimed to improve the ear health of Aboriginal and Torres Strait Islander populations in Queensland, including the Deadly Ears Aboriginal and Torres Strait Islander Ear Health Program (4). In the 2008–09 State Budget (75), there was a $4.4 million investment by Queensland Health to target the high rates of OM among Aboriginal and Torres Strait Islander children, including $1.4 million recurrent over three years from 2008–09, and $200,000 capital funding in 2008–09. Key deliverables in the 2014–15 operating budget (76) include continuing on-going funding of $4.1 million per year for ear and hearing health outreach services for Aboriginal and Torres Strait Islander children under the Deadly Ears Program.
A framework to address ear health in the Aboriginal and Torres Strait Islander communities will need to take into account both the individual behaviours and the environment within which they live, with a focus on the inter-relationships within and across the different levels of a system; for example, focusing on supporting parents and maternal health behaviours before, during, and after pregnancy—such as smoking cessation, breastfeeding and good infant nutrition, as well initiatives to improve surveillance and service provision. Partnerships should be made at the leadership/governance level in order to influence improvements to the broader socio-demographic risk factors, such as inadequate housing. Additionally, there should be a focus on Aboriginal and Torres Strait Islander self-government, and taking a strength-based approach to health promotion to influence health behaviours and outcomes.

1.2 Background to Deadly Ears, Deadly Kids, Deadly Communities: 2009–2013 Framework

In 2007, the Council of Australian Governments (COAG) agreed to work with Aboriginal and Torres Strait Islander populations to ‘close the gap’ on Indigenous disadvantage. The Queensland Government’s commitment was articulated as a whole of government ‘close the gap plan’, “Making tracks: a state-wide plan towards addressing the gap in health outcomes for Indigenous Queenslanders 2009–2013”. The ‘Deadly Ears, Deadly Kids, Deadly Communities: 2009–2013’ Framework (4) aligned with the Making tracks document, and targeted a reduction to the significant rates of OM in Aboriginal and Torres Strait Islander children. 'Deadly Ears, Deadly Kids, Deadly Communities: 2009–2013' (4) built on key actions identified in the Queensland Strategic Policy for Aboriginal and Torres Strait Islander Children and Young People’s Health 2005–2010 (4,77). Looking to the development of the new Framework, it will need to align with the Queensland Government’s ‘Blueprint for Better Healthcare in Queensland’ (78).

The prevalence and incidence of OM is the result of an interaction between medical and environmental causes. It relates to the social determinants of health and has medical, functional, and social components. As an intervention, the ‘Deadly Ears, Deadly Kids, Deadly Communities: 2009–2013’ Framework (4) is complex. Contextual factors, and the broader socio-political environment, often confound efforts to define the boundaries of a policy framework, and outcomes are rarely the result of linear processes, nor are they constant (57,63). The Framework, and the activities under it and their implementation, therefore, requires a different approach to evaluation than that used for interventions at the individual and group level.
2.0 Methodology

2.1 Evaluation aims

The aims of the evaluation were to:

- undertake a comprehensive evaluation of the ‘Deadly Ears, Deadly Kids, Deadly Communities 2009-2013’ Framework (4);
- draft indicator methods/potential measures for on-going monitoring, including suggestions of the types of baseline measures for effective monitoring and surveillance.

2.2 Evaluation purpose

The purpose of the evaluation was to undertake the following tasks:

- provide a review of the Steering Committee's activities under the Framework;
- define service planning opportunities and measurement parameters/structures that will assist on-going service delivery, monitoring and evaluation;
- review process aspects of the Steering Committee and Framework by:
  - exploring the role and membership of the Steering Committee, and achievements generated through this forum against the Framework’s implementation plan;
  - exploring the relevance of the strategic direction statements, Key Action Areas (KAA), individual actions and performance indicators described in the Framework;
  - exploring the level of engagement with partner communities and agencies;
  - providing a description of key approaches that have delivered significant benefit, and those that need to be amended (and how these should change).

2.3 Evaluation parameters

To frame the evaluation in a way to best support data collection for accountability and learning, the impact of the Framework was evaluated against the following three parameters as to the extent to which:

- the incidence and impact of CSOM is reduced in Aboriginal and Torres Strait Islander children;
- the Framework has enhanced the coordination, integration and delivery of health and education services that support Aboriginal and Torres Strait Islander children experiencing OM and associated conductive hearing loss;
• the Framework has enabled the inclusion of information on OM and conductive hearing loss among Aboriginal and Torres Strait Islander children in policy and service planning for health and education.

2.4 Evaluation design

This evaluation has taken a utilisation-focused approach to the evaluation, continuously engaging with the key users (5). By working closely with identified end-users, the evaluators have worked to ensure that the evaluation results can be used to support decision-making, and assist in identifying appropriate strategies for the next Framework. The utilisation-focused approach means that the final evaluation design and tools were determined in consultation with the Deadly Ears Program staff. Given the complexity of the issue addressed, and the range of stakeholders involved in the Framework, however, it was unlikely that one method would be adequate. The evaluation used a mainly qualitative approach, complemented by existing quantitative data and a structured questionnaire. A qualitatively-driven design was particularly valuable in this evaluation, as it enabled a focus on the complexities of the Framework and its implementation, including its context, and the experience and meaning of the ways in which stakeholders interact with the program (5, 79).

2.5 Evaluation methods

The methods have drawn on a range of theories and frameworks related to policy-making, system interventions and evaluation in public health. The overall method follows the six steps advised by Centres for Disease Control and Prevention (CDC) (80). While presented here sequentially, in reality the steps are iterative: (1) engaging stakeholders and intended users; (2) describing the program; (3) focusing the evaluation design; (4) gathering credible evidence; (5) justifying conclusions; and (6) reporting findings and recommendations.

Engagement with stakeholders and intended users

A critical step in the approach to the evaluation has been the early and continuous engagement with the Deadly Ears Program and, particularly, intended users of the evaluation, to ensure that their perspectives were understood and that the evaluation provided information and recommendations that could be acted on. Deadly Ears Program staff members were integral in facilitating the community stakeholder engagement process.

Based on initial discussions with stakeholders, and a review of available program documents, a description of the Framework was developed that helped inform the interviews.
Document analysis

Available data was requested, and a matrix of available data with available variables was developed, to ascertain the evaluation analysis that was possible (Appendix 1). Project documents (e.g. program field reports, relevant state policies and procedures) were collected and used to contribute to the evaluation of the Framework processes and workings of the Steering Committee (Appendix 2).

It was beyond the scope of the evaluation to conduct a comprehensive literature review on all aspects of the Framework and the broader context within which was being implemented. Rather, the purpose was to identify key literature related to core aspects of the Framework and its context, and to assist in informing future recommendations, including:

- prevention—OM—key risk factors;
- systems thinking in health;
- political determinants/changes to the political landscape in Australia and Queensland;
- community engagement.

PubMed, SCOPUS, Cinahl and Cochrane electronic databases were searched to identify the most relevant current literature. Full details of the search strategy are available in Appendix 3.

Qualitative data

Steering Committee members were invited to participate in an online survey (Appendix 4) and a face-to-face or phone interview. While partner communities and service providers were not necessarily expected to be aware of the work done by the Steering Committee, the evaluation team—in discussion with the Deadly Ears Program—felt it was important to understand service provider perspectives, to see which strategic activities undertaken by the Steering Committee were drilling down to the community level, and how this work was interpreted by service providers. In two of the program’s partner communities, the evaluators also interviewed health staff, educators and other service providers involved in work with Aboriginal and Torres Strait Islander children and families, and were advised on who would be relevant informants by the Deadly Ears Program staff. Qualitative interviews were chosen because of their ability to provide in-depth descriptions of how the Framework ‘worked’, and the experiential perspectives of stakeholders. Interviews used a semi-structured guide developed with input from the Deadly Ears Program staff approved by the program. We also interviewed Deadly Ears Program staff members.
The use of a guide allowed us to focus on the topic, and it also allowed participants to talk about the Framework (and/or ear and hearing health and services) in their own words, focusing on the issues that they felt were important. This provided the interviewer the flexibility to follow up and clarify participant ideas, and adapt interviews as the study progressed and new insights were gained. In some cases, following interviews, the evaluation team contacted Steering Committee members by phone or email to clarify issues. Interviews were recorded with informed consent and transcribed. Information sheets and consent forms are available in Appendix 5; interview guides are available in Appendix 6. Interviews took place in a public location, such as the interviewees' work place, and as negotiated with project staff prior to data being collected. Interviews were transcribed but, for the report, have been edited and may have lost nuance. In some cases, service provider perspectives were contrary to current medical evidence and, where we have included these perspectives, we have identified that they may differ from current medical beliefs about best practice.

Data analysis and synthesis

Interview data was analysed using qualitative thematic and content analysis. The evaluators sought and coded recurring patterns and themes. This process was informed by the literature, the key informants, the evaluation questions and the Framework itself. To ensure reliability and rigour of coding and categorisation, the evaluators independently coded the data using the collaboratively agreed on coding system.

2.6 Ethics and informed consent

Ethical guidelines have been implemented to ensure the informed consent of any participants participating in the evaluation. Ethical approval for evaluation of the Framework, including for data collection in communities, has been provided by Children’s Health Queensland, Hospital and Health Services Human Research Ethics Committee (ref: HREC/14/QRCH/113), and The University of Queensland’s Medical Research Ethics Committee (ref: 2014000963) (Appendix 7).

The research team observed cultural protocols relating to seeking permission to visit remote communities, communication with Aboriginal and Torres Strait Islander peoples, media protocols, and use of Aboriginal and Torres Strait Islander artwork in the evaluation report and DVD.

The evaluation sought to be culturally-appropriate, including identifying appropriate community representatives to liaise with in setting up community visits; and, during the visits,
Aboriginal and Torres Strait Islander specific reporting and evaluation mechanisms were developed, to ensure Aboriginal and Torres Strait Islander voices were clearly communicated in the final report and DVD, and findings available to community members.

2.7 Description of community sites and visits

The Deadly Ears Program activities have been implemented in 12 regional and remote Aboriginal and Torres Strait Islander communities in Queensland. The degree of engagement and services in each community is subject to negotiation with key community members, and takes into account existing services and community need.

Visits to two remote Aboriginal and Torres Strait Islander communities were arranged and facilitated, initially by the Deadly Ears Program Director, and later by Deadly Ears Allied Health and Health Promotion team staff. Two of the twelve Deadly Ears Program partner communities were visited (August 13th–15th 2014 and August 18th–22nd August 2014). They represented two ‘case studies’, rather than a representative sample, to see how Steering Committee actions drill down to communities. The evaluation team on these trips included both university evaluators (JD & LS) and film crew (DL-L & FJ from TheStoryBoxes). Introductions and scheduling of interviews were facilitated by Deadly Ears Program staff, either in advance or on arrival in the community.

2.8 Description of participants

This evaluation sought to obtain the views, experience and observations of a range of stakeholders including, but not limited to:

- health and education providers in communities;
- elders, service managers and service users;
- Framework Steering Committee members;
- Deadly Ears Program staff members with key sector work roles.

3.0 Data collection outcomes

The focus of the data collection was two partner communities, namely Woorabinda and Mornington Island, during two community visits; as well as interviews with key stakeholders and Deadly Ears Program staff members.

An on-line survey was completed by seven members of the Steering Committee regional and central level, and from different agencies. A summary of interviews held with
stakeholders in two Deadly Ears Program partner communities, and with members of the Steering Committee and the Deadly Ears Program staff involved in sector work, is provided in Appendix 8. Following collection of the on-line questionnaire responses, individual interviews were held with 6 of the 14 Steering Committee members, who agreed to be interviewed. Two Steering Committee members requested that they be interviewed at the same time.

In the two partner community visits by the evaluation team, 21 interviews were undertaken, representing 18 individual interviews and 3 group interviews, with a range of stakeholders in both communities. Consent was provided for all but three interviews to be filmed.

Three separate interviews were held with Deadly Ears Program staff members to discuss their sector work. This incorporated activities across the maternal and child health, early childhood education and care, education and university sectors. The use of in-depth interviews with different stakeholders, at different levels in the system, allowed the evaluators to understand how the Framework and actions of the Steering Committee worked in different settings (5, 79, 81). Framework and Deadly Ears Program documents collected for analysis purposes are listed in Appendix 2.

4.0 Findings

4.1 Describing the program

OM is recognised as a medical condition within the Framework, but also highlighted is that there are a number of underlying social determinants of health that contribute to its distribution. The Framework also recognises that the effects of OM are not only fluctuating or permanent hearing impairment, but also include poor educational outcomes and subsequent employment opportunities. From this perspective, the Framework views OM as being embedded in the system in which Aboriginal and Torres Strait Islander children are born, grow, live, work and age (82). The underlying theory of the Framework can best be represented in the International Classification of Functioning Disability and Health, as outlined below.
Figure 3 International Classification of Functioning Disability and Health

The intent of the Framework and the Steering Committee is to develop a consistent approach to prevent, identify and treat OM (i.e. the health condition), and support children with OM or conductive hearing loss, in order to increase functioning and participation and, in particular, participation in education. Concurrently, the Framework and the Steering Committee are expected to influence system enablers, such as work force development—developing guidelines and identifying and working with partners to address the environmental factors and the social determinants of ear and hearing health. It is expected that through a consistent and coordinated approach and agreeing upon, and subsequently reporting on, actions, there will be sustainable decreases in hearing impairment due to OM, and an increased participation.

4.2 Evaluation Question 1

*To what extent has the incidence and impact of CSOM reduced?*

Evidence for progress towards reducing the incidence and impact of CSOM comes from the Deadly Ears ENT clinics, based on presentations. This data is stored in a centralised database and indicates that the presentations of CSOM in both 0–4 and 4–14 year olds from 2009–13 reduced, and that there was a reduction in presentations of CSOM in all children from 2009–10 to 2013–14, following health promotion and education in 2010 (see Figure 4)². In community interviews, the challenges in reaching 0–4 year olds was mentioned and,

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² In the scope of this evaluation, the evaluators have reviewed only the processed Deadly Ears program data. The evaluation team did not analyse the raw data as the focus was on the Framework not the program.
consequently, children under four years old may be under-represented in the clinical data. In the communities visited, senior health professionals stated they had no data on the prevalence of OM.

Clinical data from other providers is not stored in a central database, and it was beyond the scope of the evaluation to review data from other providers. It was not possible to assess the overall reduction in the incidence of CSOM state-wide, due to the lack of population level data. These data limitations mean it is not possible to draw conclusions on reductions in the incidence and impact of CSOM as a result of the Framework. Additionally, care must be taken in attributing any changes in CSOM incidence in partner communities serviced by the Deadly Ears Program to the Framework (and not the Program).

What is less well documented is evidence of a reduction in the impact of CSOM, and it is not possible to draw conclusions on the extent to which impact has been reduced. Key informant interviews suggest that follow-up on referrals and early identification of children with OM/CSOM and associated hearing impairment was resource-intensive, and irregular school attendance meant referrals were not always followed through.

4.3 Evaluation Question 2

To what extent has the Framework enhanced the coordination, integration and delivery of health and education services that support Aboriginal and Torres Strait Islander children experiencing OM and associated conductive hearing loss [focus: work undertaken by the Steering Committee for the Framework.]

While the Framework represents broad efforts to establish state-wide goals and directions, the focus of Strategic Direction 1 is primarily on activities on the ground in Aboriginal and Torres Strait Islander communities. The KAAs under Strategic Direction 1 include the following: (1) prevention; (2) screening, surveillance and diagnosis; and (3) treatment, care and support. Coordination, integration and delivery of services are considered below, under these three action areas.

It is important to note here that the Framework seeks to bring together direct service delivery and systems level work, not simply that they sit side-by-side, but rather that they are closely intertwined and inform one another.
Key Action Area 1: Prevention

Prevention activities and strategies under the Framework have undergone significant evolution since their inception. The stated objectives under this KAA are (1) all stakeholders are educated about the prevention and management of OM and ear health conditions in Aboriginal and Torres Strait Islander communities; (2) Queensland Aboriginal and Torres Strait Islander mothers and families adopting healthy lifestyle behaviours that lower the risk of ear health conditions; and (3) improvement in public and environmental health for Aboriginal and Torres Strait Islander children, particularly in remote areas.

Progress towards objectives: All stakeholders are educated about the prevention and management of OM and ear health conditions in Aboriginal and Torres Strait Islander communities.

The first action under this objective relates to embedding in systems (See Section: Taking a systems approach to systems change). The performance indicator, ‘Prevention and Management of OM is included in the Syllabus for Ante-natal and Post-natal Classes, Health Workers and Early Educators’ (83), was addressed. Deadly Ears Program staff members were directly involved in workshop-based training to further develop the skill base of stakeholders in communities. Twelve ‘Brief Intervention Training (Nutrition and Physical Activity)’ workshops were held between August 2011 and June 2012, with 148 attendants. Three workshops incorporated an additional tobacco focus (83, 84).

The number of allied health students completing ear and hearing health education and training was increased through the engagement of Deadly Ears Program allied health staff with a number of universities across Queensland3. This engagement took the form of influencing curriculum planning and delivery for relevant allied health courses at James Cook University (JCU), University of Queensland, University of the Sunshine Coast, Griffith University, and Central Queensland University. It included the delivery of twelve lectures, participation in JCU Practice Scholars’ curriculum review and development of a learning module for Griffith University Speech Pathology students (83). Deadly Ears Program staff have commenced developing a tool kit for allied health staff to use in planning, implementing and evaluating culturally-safe services for allied health clinicians (e.g. community booklets on child development, community-based speech assessment tools, speech pathology/occupational therapy tool kits using community books and resources) (83).

Online professional development focused on early years of education. The ‘Deadly Kids Can Listen and Learn’ course was facilitated from 7 May–27 July 2012 (enrolment: 30; 3 Discussed in more detail under Key Action Area 5 ‘Workforce Development
completions: 25); and 13 August–2 November 2012 (enrolments: 28; completions: 22) (85).
The number of early educators completing ear and hearing health education and training was increased. All health modules are now combined into a complete vocational package for use by all TAFEs that offer children’s services vocational qualifications. Formal evaluation of uptake by educators undertaking vocational qualifications in early childhood education and care setting was scoped, but it is not clear if this was carried out. Australian Children’s Education & Care Quality Authority (ACECQA) audits of Queensland early childhood education and care services reflected improvement in health and hygiene criterion in the national quality standards over time (84).

Ear and hearing health promotion activities and social marketing campaigns targeting Aboriginal and Torres Strait Islander Queenslanders were a key action under this objective. Deadly Ears Program staff members interviewed felt that they had moved to a new phase of building upon these earlier social marketing strategies. The scaling back of the original approach correlated with assessment of progress made against program goals in partner communities. Campaigns developed for, and delivered to, a Queensland Aboriginal and Torres Strait Islander audience were conceived within the broader Australian context. For example, the Deadly Ears Program was represented on the Care for Kids’ Ears campaign reference group (and used the material for training purposes) and provided input in 2013 into the evaluation of the first iteration of this campaign (Queensland Health [Deadly Ears Program]) (83). The evaluation of the Care for Kids’ Ears campaign indicated that it had a positive impact on awareness and knowledge of OM among Aboriginal and/or Torres Strait Islander populations, and found statistically significant differences in help-seeking behaviour among those who had been exposed to the campaign, compared to those not exposed (86).

The social marketing strategy was developed by the Deadly Ears Program, with community input, in the partner communities. Consultation has led to the expansion of community engagement and target groups in these communities, and enabled the identification of key community groups able to assist in delivering health promotion messages (87; Key finding 2-4). What is less well-documented is evidence of the health promotion activities being taken up more broadly; whether key community groups have been assisting in delivering the health promotion messages; and whether the messages have been delivered consistently over time.

Information pertaining to one performance indicator—increased access to parenting support—was not available for review. Information was not available for antenatal visits or post-natal care, but there is community specific information that rates of attendance at child health checks have increased where multiagency cooperation occurs (83, 89, 90, 91).
Progress towards objectives: Queensland Aboriginal and Torres Strait Islander mothers and families adopt healthy lifestyle behaviours that lower the risk of ear and hearing health conditions.

Activities in the early childhood education, schools, and maternal and child health domains represented the foci for social marketing of ear and hearing health strategies, and there was clear evidence of strong relationships between the Deadly Ears Program and these sectors in partner communities where these strategies were developed. Current efforts in prevention focus on education and awareness-raising for children and their parents/carers. Health promotion activities and social marketing campaigns were the identified focus of action under this objective.

While the contributing social and environmental determinants to OM are broad, the actions that receive the greatest attention were more likely to be when organisational traction and/or national targets meant that there was financial support and/or mutual accountability driving that investment. For example, one member of the Steering Committee commented:

The Indigenous work within the unit [that gets promoted] is tobacco … because it’s connected to the Close the Gap targets and there’s money … attached. (SC06)

Other actions reported, that fall under this objective, include inter-agency and inter-departmental links to further goals:

- Investigation of opportunities to link with Optimal Infant Nutrition project, which is due to commence in 2013–14. (84)
- Some links have been established with primary prevention initiatives driven by Queensland Aboriginal and Islander Health Council (QAIHC), including tobacco, immunisation and nutrition programs (92), but it has been difficult to ascertain the role of the Framework in these initiatives. Also, attempts to evaluate effectiveness of preventative strategies, to disseminate findings and to ‘scale up’ effective interventions were not in evidence.
- Funding opportunities being investigated in order to support best practice health promotion activities. (92).

It was reported that little primary prevention is undertaken across the Aboriginal and Islander community controlled health services (AICCHS) sector other than opportunistic patient education and, in some areas, primary prevention messages that have been integrated into school screening programs. Aboriginal Medical Services (AMSs) lack capacity to develop and implement sophisticated health promotion/primary prevention activities. (93)
In response to the above, QAIHC hosted an ‘OM Primary Prevention’ workshop in May 2014, in Brisbane. This workshop provided an opportunity to identify key issues and provide a catalyst to progress primary prevention approaches that will reduce the impact of OM. Consensus was reached that Queensland had considerable room for improvement in demonstrating multiple features of good practice in primary prevention focused on ear and hearing health amongst Aboriginal and Torres Strait Islander Queenslanders. Importantly, strengths and barriers were identified, along with criteria for assessing proposed strategies. A number of necessary actions were identified from the workshop, although it is not clear who is taking responsibility for their coordination.

Little by way of robust evidence was available to measure improvements in child and maternal nutrition, increased breastfeeding rates, decreased rates of children under 15 who live with a smoker, and increased immunisation rates. Without baseline and regular monitoring data and a clear program theory (an idea of how the Framework ‘works’ described graphically or in a narrative), it is difficult to assess progress made in these areas.

One initiative under the Framework (4), the ‘Baby Binungs Neonatal Project’ (83), resulted in resources to be used and distributed by maternal and child health workers, to engage families in conversations around OM and its impacts, and the possibility of early onset. The Deadly Ears Program staff consulted with Healthy Hearing Program nurses to develop this resource:

*We ran a regional project to look at whether the people that are doing those newborn hearing tests can actually have conversations with Indigenous families because they identify Indigenous families to say, “Are you aware that this is a significant issue? Here are some things that you can do to prevent it. Here’s what you should be doing if you notice these signs and symptoms. (SC 01)*

Efforts are continuing to identify appropriate points for influencing primary prevention, as explained by one member of the Steering Committee:

*You do want to be able to pick up [identify] the infections early, but you also want to prevent them from happening, so that’s where there are opportunities with, say, the population health team, whether there is potentially systems that they use, it might be information for families if they’re getting their shots before baby’s born or if the baby is getting their first immunisations, there are opportunities there to have some health promotion messages. (SC 01)*

*Progress towards objectives: Improvement in public and environmental health for Aboriginal and Torres Strait Islander children, particularly in remote areas.*
In relation to specific performance indicators under this objective, no baseline or annual data was identified to assess effectiveness in the areas of the environmental health worker program, animal management and partnerships with primary healthcare providers and housing.

While community stakeholders in discrete communities shared examples of actions in these areas, it remains difficult to assess the degree to which the Framework was responsible.

Evidence of gains against this objective is limited to a small number of activities. Efforts in this area have been hampered by a real or perceived limited public health work force and infrastructure, as well as fragmented health services at the local level and limited resources at the state level. The 2012–13 Annual Report (98) noted an improved percentage of early education centres that pass accreditation in areas of infection control and hygiene (83). The 201213 Annual Report (83) also noted that opportunities had been identified for the Deadly Ears Program team to provide strategic advice and support on the development, implementation and evaluation of the ‘Aboriginal and Torres Strait Islander Supportive Environments Work’ initiative. However, work on this initiative has been delayed due to government changes, and no data was available at 30 June 2013.

QAIHC has undertaken regional planning for primary prevention activities in south-west and far north Queensland regions (92, 93). The Listening Report (93) found that little primary prevention had been undertaken across the AICCHS sector other than opportunistic patient education and, in some areas, the integration of primary prevention messages into school screening programs. Health work force capacity, health workers’ lack of high level health promotion skills, and competing tasks all meant that primary prevention work was not afforded due attention.

Key Action Area 2: Screening, surveillance and diagnosis

Screening, surveillance and diagnosis represents Key Action Area 2 under Strategic Direction 1. The main objectives in the Framework relate to (a) access for Aboriginal and Torres Strait Islander children to appropriate screening, surveillance and diagnostic services to effectively manage OM and other ear and hearing health conditions; and (b) a standardised and systematic approach to the screening, surveillance and diagnosis of OM and other ear conditions in Aboriginal and Torres Strait Islander children in Queensland.

Progress towards objectives: Aboriginal and Torres Strait Islander children have access to appropriate screening, surveillance and diagnostic services to effectively manage OM and other ear health conditions.
The Queensland Chronic Disease Guidelines: Child Health Check (94) include a requirement that, for Aboriginal and Torres Strait Islander children, ear and hearing screening should be included in all checks until 15 years old. The guideline notes the burden of OM and hearing loss is high in Aboriginal and Torres Strait Islander populations.

The QAIHC Hearing Health Project report, (93), has reported that all AICCH services actively promote MBS715\(^4\) indigenous child health checks, there is good evidence that the number of health checks is increasing across the state, and hearing health is included in the assessment. However, a number of clinicians have reported that, in some instances, the hearing health component is not comprehensive and often includes only the basic hearing health questions and a look in each ear with an otoscope. This observation highlights the need for a greater match between the clinical guidelines and the requirements under item MBS715.

It has been recorded that an updated allied health service needs analysis has been undertaken in communities including Mornington Island, Doomadgee, Hopevale, Normanton, Woorabinda, Palm Island, Northern Peninsula Area communities, and Cherbourg. As part of this process, it has been reported that an increased proportion of referred children are being seen by an ear/ hearing specialist (including allied health practitioners) (83).

All primary healthcare professionals, including community-based child health nurses and Aboriginal and Torres Strait Islander health staff, play a role in ear and hearing health assessments, with this task being integrated into child health checks in clinics and being performed through schools or day care centres, and opportunistically at other contacts. Importantly, services are veering away from appointing ‘ear and hearing health specialist’, and towards promoting a broader uptake of ear and hearing health assessment and screening skills in the primary healthcare work force. This approach also protects the delivery of ear screening and assessment activities against departure of key staff members and, thereby, protects continuity of service delivery. The performance indicator [Increased number of health workers dedicated to Aboriginal and Torres Strait Islander ear and hearing health] is no longer felt to be relevant, as it is associated with a higher risk of service non-delivery in regions with high staff turnover. It therefore requires replacement with a performance indicator that reflects current strategies in this area.

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\(^4\) Medicare Benefits Schedule (MBS) item 715 is an annual health check for Aboriginal and Torres Strait Islander people of all ages.
Progress towards objectives: A standardised and systematic approach to the screening, surveillance and diagnosis of OM and other ear and hearing health conditions in Aboriginal and Torres Strait Islander children in Queensland.

The approach to screening for ear health and hearing impairment under the Framework has encompassed a broad review of screening and child health check processes across the State. Where required, advocacy for changes has been undertaken to achieve better alignment between recommended practices and clinical guidelines for best practice. The intention has been to aim for systemised optimal screening practices, by making them part of normative routines in every healthcare setting. So, for example, the Primary Clinical Care Manual (PCCM), the Personal Health Record (the Red Book), the Chronic Disease Guidelines, and the Child and Youth Health Practice Manual have all had direct relevance. One key goal here is that child health workers are consistently provided with appropriate prompts to carry out activities, whether they are educational, screening or assessment.

Following an analysis of need, Office of Aboriginal and Torres Strait Islander Health (OATSIH)-funded AMSs are able to access a range of ear and hearing assessment equipment. Nationally, over 820 pieces of ear health equipment have been provided. Equipment includes pneumatic and video otoscopes, audiometers and tympanometers. Funding supports the supply, maintenance, calibration and repair at no cost to the health services. This equipment is used by appropriately qualified health professionals at the AMS. (95) Australian Hearing echoes this improved availability of required equipment. Ready access to a functioning otoscope, tympanometer and audiometer was reported to now be available in community health centres (including AMSs) throughout Queensland. Equipment is in good working order. (96) There was evidence from several regions that efforts have been injected into improved coordination and standardisation of services, with a re-orientation from screening to surveillance. The 2012–13 Annual Report documented that process had commenced in both the south-west and far north Queensland regions to implement a coordinated and standardised approach to screening, with an aim of shifting from school screening to surveillance and a focus on 0–5 year olds.

In partnership with Healthy Hearing and Child and Maternal Health, the 'Baby Binungs’ project was completed, involving a trial of a systematic approach for OM screening and follow-up for 0–4 year old children from selected Aboriginal and Torres Strait Islander populations (83). This provides an example of how 0–4 year old children can be more effectively reached for OM screening and follow-up.
This work under the Framework has, however, presented a range of challenges, as there is no single entity responsible for guidelines, necessitating a focus on multiple tools rather than any single stakeholder. The on-going challenge this presents, and the need for national leadership, was highlighted by a member of the Steering Committee:

*The one change that would be of greatest benefit would be a consistent approach nationally to addressing otitis media. There are guidelines that have been developed but they are not universally adopted and a classic example of that is that we don’t see children being routinely checked as part of their child health checks, when the national guidelines strongly recommend that that occurs. That checking process will go a long way to providing a means of communicating with families around some preventative activities but it will also pick up children very early on who might be developing otitis media and prevent it from becoming a chronic issue where you see some of this subsequent impacts begin to manifest like hearing loss and so on. So, ensuring that there is a consistent, robust means of identifying children through the child health check process that everybody follows will be one of the key outcomes from any national approach. (SC 01)*

Almost universal neo-natal hearing screening now occurs in Queensland through the Healthy Hearing Program, with the newly available QChild database facilitating the flow of information to the Deadly Ears Program. This has the potential to make identification and tracking of Aboriginal and Torres Strait Islander infants and children possible and, thus, help on-going management, care and support.

All community health workers with whom the evaluators spoke were motivated to provide the best possible ear and hearing health service, and knew well the impact that hearing impairment can have on education, employment attainment and wellbeing. However, taking a population focus to addressing ear and hearing health did not appear to be sufficiently ingrained in local systems, with organisational priorities placing clinical load management above population-wide strategies. In one case, population-based screening was supported only because a health worker volunteered her services, despite this activity falling outside her position description. This highlighted gaps in work force planning to meet the requirements under the Framework’s Implementation Plan.

As schools and day care centres provide an obvious setting for capturing children and undertaking mass screening and/or surveillance, these environments have played a pivotal role as environments for screening and surveillance, through activities from daily classroom health checks to whole-of-school screening programs. Teachers to whom the evaluators spoke were well versed in the importance of these activities, playing a supportive role in care, such that they had become part of routine practices:
Every day we do a hearing [check] – we ask children if they’ve got sore ears or we check to make sure there’s nothing running down the sides of their ears so they’ll identify whether it’s their left, their right ear, or both. There is a sister or a nurse that comes down from the hospital at least once or twice a week, as often as she can. We give those lists to her. She goes through, double checks, checks with parents, gets them to the hospital, well she asks them to take them to the hospital. She lets us know. We’ve just had kids go through and have operations done on their ears so the parents have been quite good – well, the ones in my room letting me know. I’ve had one. She had an operation last week so she’s let me know that this is what’s happened and this is what’s going to keep happening for the next week or so with her ear, you know, losing fluid from the grommet things. (COM1 02)

These screening and surveillance activities meant that cases of CSOM, and associated hearing impairment, could be detected earlier, and responded to with appropriate treatment and support. The power of screening data, when it is used to provide specific feedback to teachers about their students’ educational needs, was emphasised by a school principal:

In terms of those things that we think that could be enhanced within what’s already happening, at the moment we do bi-annual screening of children for their ears, that’s a major advancement from my experience of nearly 11 years now in Indigenous communities. …The information that I am able to feed from those screenings back to teachers around individual children who may be having some hearing loss at any particular point in time, or they might have a hearing loss in one ear, it allows the teacher to think strategically about how they might position that child in their classrooms. So whether they might need them closer to them, they might need them on the left side of the classroom or the right side of the classroom and just the knowledge that when I’m teaching that particular child or when I’m teaching this specific concept on I might need to face that particular child so that they can see my lips so that they’re getting cues from what I’m doing. So that information that we get back from the screening is really valuable information for me to feedback to classrooms. (COM1 05)

Regular non-attendance at school, or non-engagement with formal early care environments, were some of the factors that made universal and consistent capturing of the target population difficult. The particular challenge of capturing 0–5 year olds for early screening, along with their parents or carers, has been considered by the Deadly Ears Program team, especially when children were not accessing any formal care. The use of community health promotion events in partner communities has been used as both an educational and screening opportunity, particularly for those children who are hard to reach:
...for the naught to fours, or the naught to fives really that don’t go to school who are the ones that we’re missing at the moment, which is why [and] how the Fun Day came about. We started off last year acknowledging that we’re missing a lot of the naught to four year olds and they’re the ones that we need to be seeing to identity early hearing problems so that we can try and have interventions to stop hearing loss or if necessary, try and rectify it. So, when we—in June last year ...we actually had a day here at the hospital where anyone from community could bring their children in to have their children seen and we didn’t see a large number of children, I think it was only about 13 or 14 children but they were children that we wouldn’t have seen otherwise. So it was fantastic and it’s from that, and in conjunction [with] the Deadly Ears and, as it’s turned out, all of community, all of the other stakeholders and service providers, we’ve had a fantastic fun day [this year] where there was lots of fun and I can’t remember off hand how many child we saw, over 40 I think. (COM1 01)

One member of the Deadly Ears Program staff highlighted the importance placed on reaching this age group:

We always try and work with playgroups and mums and bubs groups, ...—that group is a group that the team, our Deadly Ears team that goes out there wants to work with and alongside and yeah, and they’re such an important group because it’s such an important age group ’cause they’re sort of like the age group that we’re really wanting to target, the zero to fours and how can we get in early and help to influence what happens, whether people get ears checked and know about what can happen and interact with their kids and all that stuff, ...So they’re a very important space in our communities ... (SW03)

Deadly Ears Program staff also highlighted the relative ease of establishing relationships and working with stakeholders in the school system, versus stakeholders in day care and playgroups. This range of issues highlighted the need for community specific solutions, and a strong sense of community ownership, to drive local problem solving and innovation.

Evidence is now showing that screening alone is ineffective at reducing OM, unless it is undertaken in conjunction with other services. One member of the Steering Committee emphasised this view that school screening is not working at reducing OM:

And the other thing that we badly need to do is to break away from doing screening in schools, but the people in the communities themselves, and the Aboriginal health workers are welded to that idea. (SC05)
This presents another example of where a continuous dialogue with communities and stakeholders needs to take place, to ensure that there is a shared understanding of what is needed and what actions are supported by evidence.

**Key Action Area 3: Treatment, care and support**

*Treatment, care and support* represent Key Action Area 3 under Strategic Direction 1. The objectives include ensuring that (1) Queensland Aboriginal and Torres Strait Islander children and families have access to appropriate specialist and mainstream services to treat and manage OM and other ear and hearing health conditions; and (2) Queensland Aboriginal and Torres Strait Islander children and families affected by OM receive appropriate learning and development support.

**Progress towards objectives:** *Queensland Aboriginal and Torres Strait Islander children and families have access to appropriate specialist and mainstream services to treat and manage OM and other ear and hearing health conditions.*

Evidence of progress towards this first objective under Key Action Area 3 is strong. Treatment and management of OM and other ear and hearing health conditions have been significantly improved.

Revised Recommendations for Clinical Care Guidelines on the Management of OM in Aboriginal and Torres Strait Islander Populations (29) have triggered a number of activities:

- Revised Recommendations for Clinical Care Guidelines (29) have been distributed to all health services (95);
- The Australian Medicare Local Alliance (AMLA) has promoted the guidelines (29), and held workshops to promote development and implementation of the best practice model of care, based on the guidelines (29), in various locations across Australia.\(^5\)

From January 2011 to June 2013, primary healthcare services received clinical leadership support services to enhance ear and hearing health management on 68 occasions [performance indicator was 35]; 49 additional ear and hearing health outreach visits provided by specialists [performance indicator was 32]; 286 additional ear and hearing health surgical services provided to Aboriginal and Torres Strait islander children [milestone was 230]; and additional specialist ENT services provided to 1,541 Aboriginal and Torres Strait Islander children [milestone was 1,210]. Further to this, the Deadly Ears Program delivered additional audiological services to 854 children. In every community serviced under the measure, the presentations of chronic OM at ENT clinics decreased over time (83).

\(^5\) AML Alliance is no longer funded to support Medicare Locals as of 30 June 2014.
Additionally, (a) there is evidence of access to visiting health professionals, including Australian Hearing audiologists, who can support and develop ear and hearing health knowledge and skills in the community (96); (b) there is feedback that community-based clinic staff maintain confidence and competence with using specialist equipment for ear and hearing health checks (96); and (c) a community engagement process was used to inform the development of a resource package and DVD to prepare children and parents/carers for surgery (88).

All of the above activities indicate good progress against the performance indicator: *Adopt and implement a standardised state-wide approach to treatment by health practitioners across Queensland*. Further evidence is desirable, however, to provide information about the reach of these initiatives.

Once children have been identified as requiring further testing, ENT assessment and/or surgical intervention, the community health staff and school teachers who were interviewed frequently discussed the importance of explaining test outcomes, follow-up appointments, and treatment and management options with parents.

Deadly Ears Program records show an increasing number of ENT clinics from 2006 to 2013–14, as well as increasing attendance at ENT clinics. Attendance at clinics for further diagnostic testing, management and/or surgical intervention has been greatly enhanced where Aboriginal and Torres Strait Islander health workers have been present and able to liaise with families regarding appointments and to provide assistance, where required, to enable attendance and adherence to management protocols.

Further evidence against the first objective under Key Action Area 3, and particularly the additional performance indicators, has been covered in evaluation question one, and is not included here.

**Progress towards objectives: Queensland Aboriginal and Torres Strait Islander children and families, affected by OM, receive appropriate learning and development support.**

Evidence for progress towards the second objective under Key Action Area 3 is strong. Appropriate learning and development support for Queensland Aboriginal and Torres Strait Islander children and families affected by OM has been enhanced by a ‘whole of school’ focus under the Framework. Examples of this include: distribution of sound field amplification systems (SAS) to regions, as part of the regionalisation of the Department of Education, Training and Employment (DETE), with each region having a loans regional contact who
manages the loans service specific to the region (97); all kindergarten services have free access to functioning sound amplification systems; newly built kindergarten services on state school sites in areas with high proportions of Aboriginal and Torres Strait islander children are required to include access to SAS within the building specifications (fixed or portable); the recommendations of the Deadly Ears Program team to improve the acoustic design of these buildings and support the use of SAS has been accepted and included in the planning specifications; other kindergarten services are able to access free loan of SAS, as required, through the Specialised Equipment and Resources Program (DETE) (97); an increase in teachers using functioning SAS equipment; and teachers having access to a range of visiting professionals who have the skills and knowledge to promote and support the use of SAS, and check and carry out basic troubleshooting of systems (96).

Actions under the Framework support greater attention to classroom strategies, where every child in a classroom receives benefits, and a ‘whole of school’ approach to staff preparation and training, in-servicing and on-going support. In addition, the Framework endorses school-wide expectations for staff performance, to minimise disadvantage experienced by children with hearing impairment or fluctuating hearing loss. Classroom equipment (e.g. SAS, interactive whiteboards, Yacker Trackers) and classroom acoustic design to optimise learning, often featuring creative and low-cost adaptations, were something that teachers to whom we spoke were well aware of:

They’ve got the stereo. And the interactive whiteboards because they’ve got their speakers on them too which brings things up a lot louder as well. Sitting the kids in areas where they’re happy that they can see instructions and where they can see me and they can see my lips and they can understand that. I think that’s about it. Everything’s sort of very visual. So making sure that they’ve got clear view of everything. (COM1 02)

In cases where school-wide standards of practice supported embedded practices, school personnel observed that they became the norm, even in environments with a high turnover of staff:

So the processes for example the wearing of the SAS system … the ‘Breathe, Cough, Blow’ program, things like that are now built in to our classroom expectation standard of practice (COM2 07)

The Classroom Acoustic Project was undertaken by the Deadly Ears Program, in conjunction with a participating school in a partner community, as an innovative project to establish noise standards in classrooms, and to look at the effectiveness of low-cost adaptations as a classroom acoustic intervention in remote community settings. Feedback from staff at the participating school was very positive, as the additional benefits it offered in
supporting positive learning environments was obvious. The following assessment of the experience of the school’s involvement in the Classroom Acoustic Project was described as follows:

The Classroom Acoustic Project was a project that we entered into with the Deadly Ears team, and it was all about trying to maximise the support for our kids around hearing and around their maximum engagement, I guess, in the classroom. So it was around looking at the environment and saying, well, what else can we do that’s simple, that’s cost-effective, that’s going to help support our kids in the classroom so that they can hear and engage to their full potential? We already had things in place, like, sound-filled [amplification] systems in every classroom so we’d already been making some progress. So this was just, I guess, almost the icing on the cake; it was, what else can we do as a school, as a community that can support our kids?

The feedback from the teachers around that acoustic project has been very positive in terms of the kids, in terms of the engagement of the kids. Just in terms of them being able to teach in that environment, it’s made a huge difference. So, yeah, I’ve had nothing but positive feedback from teachers around that project. (COM2 06)

The promotion of a ‘whole of school’ approach is what is innovative here. The traditional approach, however, represented by targeted, individualised responses, where individual children with permanent hearing impairment are verified, continues to be a necessary strategy to attract school resources. For children with verified hearing loss, Australian Hearing can provide bone conductors and/or hearing aids, and additional support to teachers may be available. This approach does not seek to provide service coverage in the school population as a whole. For teachers, both approaches are seen as beneficial, although individualised responses are the ones with which many are most familiar and practised in. The focus of activities under the Framework has been one with a stronger population strategy for dealing with hearing loss in the school environment, and is an important and effective addition to existing options.

Information pertaining to other performance indicators—number of Aboriginal and Torres Strait Islander enrolments in the preparatory program as a proportion of the general student population; average Aboriginal and Torres Strait Islander student attendance at school; and proportion of average Aboriginal and Torres Strait Islander students who meet national benchmarks in literacy and numeracy in years three, five, seven and nine—was not available for review. Work was started on developing a Deadly Ears’ child development screening tool, based on the performance indicators, to increase uptake of the Deadly Ears’ child
development screening tool by relevant health and education professionals. However, it was subsequently felt to be inappropriate, and was discontinued.

**Key Action Area 4: Partnerships**

Under partnerships, the Framework seeks to achieve effective and collaborative relationships between Aboriginal and Torres Strait Islander communities and government and non-government agencies involved in the delivery of services impacting on ear and hearing health. The key action areas relate to collaboration with communities, and placing OM on the agenda as a significant and chronic health issue. Each of the key action areas have performance indicators, and is reported on by the Steering Committee in Annual Reports.

**Progress towards objectives: Collaboration with communities**

Under the key action areas of collaboration with communities, the Framework aims to ensure (1) collaboration occurs between communities, local health clinics, early educators and other health service providers, to undertake ear and hearing health screening and intervention of Aboriginal and Torres Strait Islander children; and (2) community ownership of, and participation in, the delivery of services impacting on ear and hearing health. The specific indicators under the first action point refer to increasing the:

- number and proportion of visits by health workers to early education facilities to conduct screening;
- rates of screening, identification and referral associated with OM;
- rates of ear screening for children from six months of age, including during child health checks.

Given the importance of early detection of OM, the focus on infants and young children is pertinent. The challenge in reaching this population also makes early education facilities critical for capturing this age group, notwithstanding not all young children will attend early years facilities. Health workers visiting early education facilities may have several advantages but, in terms of ear and hearing health specifically, since the Framework began in 2009, one participant suggested that it is more important that pre-school children receive routine regular surveillance. This is also consistent with the national guidelines. Nevertheless, many informants valued screening and changes to policy and practice, and reasons for this have not yet permeated down to service providers. Lay understandings of disease and appropriate treatments are often at odds with medical evidence, especially when medical evidence changes and practices, which were previously considered ‘best-
practice’, are replaced based on new evidence. While changing attitudes and understanding of ‘what works’ is complex, failure to do so can contribute to continued misunderstanding, and prevent the community and provider ‘buy-in’, essential for system-wide change.

The provision of input into the 2013 revisions of the Personal Health Record and the Primary Clinical Care Manual, that align clinical ear and hearing assessments with the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations (29), was an important Framework output. The Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations (29) are based on a systematic review of current evidence. The guidelines (29) are comprehensive, and include guidelines for the prevention of OM and hearing loss, diagnosis of OM, prognosis, medical management, audiological assessment, and management and prioritisation of primary healthcare services in different settings. The guidelines (29) include giving families and caregivers evidence-based advice, related to continued breastfeeding for at least six months (note: does not mention exclusive breastfeeding as recommended by WHO); and basic hygiene, such as ensuring children wash and dry their hands after blowing their noses or coughing, keeping children’s faces clean and avoiding use of a pacifier after six months of age. The Personal Health Record requests that caregivers of Aboriginal and Torres Strait Islander babies place stickers on the front cover to inform health staff that their baby needs ear checks and extra immunisations. It reminds healthcare workers and caregivers that Aboriginal and Torres Strait Islander children have the world’s highest recorded rates of middle ear infection that, if persistent, can impact on the child’s hearing, learning and development, and that their ears should be checked each time they present at the health centre.

Interviews with Steering Committee members and health professionals identified a number of context variables that can prevent the consistent application of the guidelines, including across the AICCHS sector (93). The Annual Reports include a number of Deadly Ears Program activities in partner communities undertaken against this action, including working to complete whole child health checks for school-aged children (6–16) in term one 2013, and screening and ear and hearing health checks. Most of the activities reported in the Annual Reports and interviews, however, related primarily to school-aged children rather than improving the number and proportion of ear and hearing health checks by health workers in early education facilities. Little was available in the way of robust evidence related to changes in referrals associated with OM.

The performance indicators under the action ‘Ensure community ownership of, and participation in, the delivery of services impacting on ear and hearing health’, include:
• development of ear health plans for each health service district;
• increased number of formal arrangements [e.g. MOU] between communities and relevant service providers;
• increased implementation of community-based environmental health programs;
• increased animal management plans implemented by local governments.

While the Deadly Ears Program’s ear health plans for its partner communities were superseded by MOUs and individual community strategies, progress elsewhere in the state seems to have been limited. (93) All Deadly Ears partner communities and their jurisdictions were covered by MOU for the duration of the Framework.

These MOU primarily allow the ENT teams to operate, the provision of audiometry equipment, integration of child ear and hearing health checks as a routine part of any child health check, and education for health workers and, as such, should promote sustainability. Under the Framework, the MOU include the development and implementation of ear and hearing health promotion and education strategies. While the signing of MOU represents an important achievement, the level of commitment on the part of the health and hospital services to implement positive ear and hearing health strategies, such as ear and hearing health promotion and education strategies, is not always specific. While recognising that the negotiation of MOU is a process of give and take, there is opportunity for MOU (new ones that are negotiated within Queensland) to be more specific about potential activities, such as reviewing local policies— for example, antenatal and post-natal care and breastfeeding—to ensure the inclusion of ear and hearing health. Some key stakeholders, who are instrumental in the implementation of MOU, indicated they were unaware of their existence, and it was not clear whose responsibility it was to disseminate documents that affect policy and practice. Finding ways to promote engagement with key stakeholders and disseminating information about MOU, and the responsibilities contained within them, at the service provider level is important in terms of helping to convey a real commitment to the initiative, and is likely to increase buy-in even if staff members face some contextual barriers in implementation.

Other examples of collaboration reported in the Annual Reports against the objective of collaboration with communities include stakeholder engagement with different providers, training to education and health providers (98) and development of materials. What is less well-documented is evidence of action to increase implementation of community-based environmental health programs or the implementation of animal management plans. Progress on this was reported to be delayed due to government changes.
Progress towards objectives: Inclusion of ear and hearing health in all primary and public health Aboriginal and Torres Strait Islander maternal and child health service policy and planning in Queensland

The indicators under the second action area of collaboration with communities in the Framework are (a) to develop and implement a state-wide advocacy campaign to ensure all Queensland Health documents that list chronic health problems amongst Aboriginal and Torres Strait Islander people include OM; (b) where relevant, to provide a description of the impact of OM in documents relating to child development, education, employment and incarceration; and (c) where relevant, policy and planning refers to OM when discussing healthy lifestyle behaviours and improvements to public and environmental health that lower the risk of ear and hearing health conditions. These Framework indicators are relevant, are likely to be cost-efficient ways of mainstreaming Aboriginal and Torres Strait Islander ear and hearing health, and have the potential to institutionalise ear and hearing health in service providers' behaviour, where contextual factors act as enablers. Some of the achievements related to these indicators include provision of input into the 2013 revisions of the Personal Health Record and the Primary Clinical Care Manual aligning clinical ear and hearing assessments, and alignment with the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations (29). Treatment and referral processes have been standardised to adhere to the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations. (29, 99) Guidelines for child ear and hearing health checks are also provided in the Queensland Chronic Disease Guidelines 3rd edition 2010 (94). Limited robust evidence was available to evaluate the extent to which these guidelines are universally applied, although available evidence suggests that application is variable and context-dependent. The Chief Health Officer's Report for 2010 and 2012 recognised OM and its impacts on Aboriginal and Torres Strait Islander children as a chronic health problem (100), and OM and its impacts were reported in the draft implementation plan (2012–13 to 2014–15) for Making Tracks toward closing the gap in health outcomes for Indigenous Queenslanders by 2033. (101) It is difficult, based on available evidence, to assess the degree to which the Framework was responsible for these initiatives but, given the participation of Queensland Health on the Steering Committee, it is reasonable to assume that the Framework and the efforts of the Steering Committee were a contributing factor. Progress towards indicators related to environmental health was reported to have stalled in the Annual Reports.

The ‘Breathe, Cough, Blow & Wash’ program was frequently mentioned by informants as a strategy to help prevent OM, and is a strategy that has been included in schools in
Aboriginal and Torres Strait Islander communities across Queensland. While this strategy is widely used, credible evidence of its effectiveness in reducing OM is scant. Educational materials also include use of SAS (e.g. Queensland kindergarten learning guideline). Hearing impairment is mentioned in Solid partners, Solid futures strategy (102); although it does not mention OM specifically. The Framework has been able to contribute to some national initiatives, such as membership of national working groups associated with the Australian Government’s investment to ‘Improve Ear Health Services for Indigenous Australian Children’. They included representation on national bodies governing the delivery of ear and hearing screening training to health workers, and the Care for Kids’ Ears National Working Group. Ear and hearing health, however, was not included as a tier one continuing concern in the (103).

**Key Action Area 5: Workforce development**

Under work force development, the Framework seeks to ensure Queensland Aboriginal and Torres Strait Islander populations have access to a sufficient and appropriately skilled work force that provides services that impact on ear and hearing health. In order to achieve this, the Framework sets out key actions related to: embedding information about OM in health work force development systems; training specialist staff in Aboriginal and Torres Strait Islander ear and hearing health; contributing to a skilled work force through the development of an accredited ear and hearing health training package; enhancing support to Aboriginal and Torres Strait Islander Health and Education workers to address staff retention; and promoting continuous improvement through monitoring community service needs and best practice. Each of the key action areas has performance indicators that are informed by current evidence on best practice and policy documents, and that the Steering Committee report on.

**Progress towards objectives: Embedding information about OM in health work force development systems**

Under this action, the Framework aims to promote the prevention and management of OM in the syllabus for antenatal and post-natal classes, health workers and early educators. Overall, the activities and outputs reported against this action in the Annual Reports suggest that incremental steps have been taken to achieve this indicator. These indicators remain relevant and, if well-designed and taught, provide an effective, efficient and sustainable mechanism for developing the knowledge and skills of health workers and early educators. Given the importance of preventing and detecting OM in under-four year olds, the focus on influencing the syllabus for antenatal and post-natal classes and early educators seems particularly pertinent. The Personal Health Record, the Primary Clinical Care Manual, the
Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations (14), and the Guidelines for child ear health checks in the Queensland Chronic Disease Guidelines 3rd edition 2010 (94) described above, can all contribute to embedding information about OM in health workforce development systems. Qualitative data from the interviews and the evidence from elsewhere, however, emphasise the role that context plays in shaping system behaviour and the extent to which these guidelines are consistently applied.

In terms of progress towards embedding information in the syllabus for early educators, the ‘Healthy Early Years Training Strategy’, a collaborative project between Queensland Health, the Department of Education and Training, and Workplace Health and Safety Queensland, is being rolled out with the purpose of promoting better hygiene and supporting child development in early education environments. Consequently, it provides a mechanism for both prevention and early intervention in relation to OM. This resource addresses health and hygiene needs, and aligns with the National Quality Standards and Learning Frameworks. While not specifically related to integration into curricula, early childhood education and care providers, and other early childhood services, also have access to relevant ear and hearing health information through the ECEC existing communication mechanisms (such as articles in the A to Z of early childhood newsletter). ACECQA audits of Queensland early childhood education and care services were also reported to show improvements against the health and hygiene national quality standards criterion. It is possible that this improvement might, in part, be related to access to these materials, although it was beyond the scope of this evaluation to interview early childhood education and care services personnel.

Improvements in general hygiene may contribute to preventing OM, especially when coupled with good basic hygiene practices in households, and actions to address the social determinants of OM.

Advisory Visiting Teachers (AVTs), with expertise in working with children with hearing impairment, and Deadly Ears Program staff members also provide professional development and support for educators working with Aboriginal and Torres Strait Islander school-aged children. Steering Committee members, however, did not attribute access to AVTs to the Framework. Ear and hearing health is also being included in EdStudio (an e-learning and authoring space for educators). The Deadly Ears Program reported under this action that they had worked with universities in Queensland to integrate ear and hearing health and support into course design and delivery for relevant allied health courses (James Cook University, Griffith university, University of Queensland, University of the Sunshine Coast and Central Queensland University), mainly through Deadly Ears Program staff members delivering lectures (83). It was not possible, however, within the scope of this evaluation to
assess the reach or effectiveness of these activities. In one of the schools visited as part of this evaluation, standard operating procedures that embedded ear and hearing health and created supportive listening and learning environments were applied, ensuring consistency in approach. No progress was reported in the Annual Reports, or by informants, in ear and hearing health in the syllabus for antenatal and post-natal classes. This may, in part at least, be due to changes in Queensland Health and the loss of the maternity and child health representative on the Steering Committee.

**Progress towards objectives: Train specialist staff in Aboriginal and Torres Strait Islander ear and hearing health**

In relation to health worker training, according to the Annual Reports and key participants interviewed in this evaluation, many staff had received training on ear and hearing health through the National Aboriginal Community Controlled Health Organisation’s (NACCHO) rollout of the Australian Government’s National Ear and Hearing Health Training Modules. The Deadly Ears Program participated in the working groups to design and evaluate this training. In addition, all AICCHS have access to the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations. According to the Annual Report 2012–13 (98), more than 200 Aboriginal and Torres Strait Islander health workers have undertaken this training and become accredited in the use of hearing equipment to assess ear and hearing health. While not the focus of this evaluation, it is worth noting additional training was undertaken by the Deadly Ears Program and reported in the Annual Report for 2012–13 (83). Interviews with key stakeholders highlighted that not all workers employed in Aboriginal and Torres Strait Islander communities in Queensland will have been trained in Queensland, or will have worked with Aboriginal and Torres Strait Islander populations in other States. Thus, while standardising ear and hearing health training across Queensland is important, ear and hearing health training should be systematically integrated into pre-deployment and/or on-site induction training. While this may happen in some instances, according to key informants, ear and hearing health training is not necessarily included in induction training for new staff.

Given high staff turnover is an issue in remote communities, access to regular, quality training is important. For ear and hearing health in the past, NACCHO Aboriginal health workers have provided an accredited training program, with over 200 Aboriginal and Torres Strait Islander health workers being trained under this program. The evaluation team was unable to assess, however, the extent to which training drilled down to practice. The

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6 The Deadly Ears program reported providing ear and hearing screening training to 175 child health nurses and health workers with the relevant Cert IV competency
NACCHO training is not currently being provided and was lamented as a loss by some informants. While the loss of the NACCHO training presents a possible gap in staff development initiative, in terms of ear and hearing health specifically, what is important is that all health professionals who work with Aboriginal and Torres Strait Islander infants, children and their families are trained in the detection of OM, and are able to guide families through the appropriate referral pathways, as relevant.

Vocational training packages for use by all TAFEs that provide children’s services vocational qualifications are available. This includes, for example, the Healthy Early Years Training Strategy that the Deadly Ears Program staff members have been involved with from its inception, and that focuses on the health aspects that educators need to take into consideration in an early years’ setting. The Deadly Ears Program staff members have provided input into relevant allied health courses at Griffith University, James Cook University, University of Queensland, Sunshine Coast University and Central Queensland University. As with ear and hearing health training, however, disentangling the contribution of the Deadly Ears Program from the contribution of the Steering Committee in achieving this is challenging. What is less well documented is evidence of the reach, application and impact of this training in practice.

Access to the 2012 Australian Early Development Index (AEDI) data has been provided by the Office for Early Childhood Education and Care for relevant use (94). This data is collected nationally every three years, and provides a snapshot of how children are developing by the time they reach school, and includes data on physical health and wellbeing, social competence, emotional maturity, language, communication and cognitive skills, and general knowledge.

**Progress towards objectives: Enhance support to Aboriginal and Torres Strait Islander Health and Education workers to address high staff turnover rates**

One of the main initiatives reported in the Annual Reports under this action has been the Remote Area Teacher Education Program (RATEP). This is an education pathway for Aboriginal and Torres Strait Islander teachers, offered in partnership with the Queensland Department of Education, Training and Employment (DETE), in conjunction with James Cook University. It implements strategies under the Queensland Early Childhood Education and Care Workforce Action Plan 2011-2014 (104) to increase the attraction and retention of culturally-competent early childhood education and care work force.

In terms of preparing teachers for the work force, a common perception held by education staff was that teachers were poorly prepared for working with Aboriginal and Torres Strait Islander children with OM and hearing impairment. Given the health and education work
force are drawn from states across the country, influencing federal level policies is essential in ensuring a uniform approach to improving ear and hearing health in teacher training. The Deadly Ears Program and DETE have also collaborated to incorporate ear and hearing health and teaching strategies for children with hearing impairment into professional development opportunities, such as Remote Area Incentive Scheme (RAIS) conference. One respondent felt that the Framework had contributed to the on-going commitment from DETE to include the Deadly Ears Program input into the RAIS conference. While useful and valuable in their own right, evidence to suggest these actions will contribute to improved staff retention is scant. While educators interviewed felt that Steering Committee initiatives, such as inclusion of ear and hearing health in RAIS conferences, were useful, less well documented is evidence on how these initiatives have contributed to improved learning outcomes.

**Key Action Area 6: Information and knowledge**

Key Action Area 6 of the Framework relates to: Having accurate data and information by developing standard state-wide protocols for the collation and reporting of accurate ear and hearing health data and information:

- monitoring evidence and research into the development of new service models and community engagement models;
- monitoring ear and hearing health services with representatives in ear and hearing health from the Aboriginal and Torres Strait Islander population, government and non-government agencies;
- reviewing services against current evidence and research, and revising services as appropriate.

As with the other action areas, there are performance indicators that are reported on by the Steering Committee in Annual Reports.

**Progress towards objectives: Having accurate data and information**

Reliable data on OM is critical for decision-making. Interviews with key informants and documented evidence, however, suggest that progress towards these indicators has been somewhat slow. State-wide protocols for the collation and reporting of accurate ear and hearing health data and information, for example, are not available. While the Deadly Ears Program and providers, including QAIHC member services, may maintain clinical data⁷, key

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⁷ In the scope of this evaluation, the evaluators have reviewed only the processed Deadly Ears program data. The evaluation team did not analyse the raw data as the focus was on the Framework not the program.
informants and Annual Reports indicate there is no consistency in the information collected across the state (93). The QAIHC Hearing Health Project reported comprehensive information on the prevalence of OM across the state is not available. The Model of Care: Ear and Hearing Health: Aboriginal and Torres Strait Islander Children (62), also reports that available data are likely to be inaccurate. Data from Australian Hearing (presented in OMOZ presentation in August 2014⁸), however, suggest increased rates of referral to Australian Hearing, where Australian Hearing and Deadly Ears Program are in the same communities, compared to communities where Deadly Ears Program does not have a community presence. While acknowledging that it is not a specific action point or indicator, engaging Aboriginal and Torres Strait Islander populations and sharing data in an accessible manner on how they are making progress in decreasing the incidence and prevalence of OM, can be an important step in promoting awareness and ownership.

**Progress towards objectives: Monitor evidence and research**

The main achievement reported in the Annual Report (105) against this was a Model of Care for an integrated service developed by the Deadly Ears Program and the Southern Queensland Aboriginal and Torres Strait Islander Ear Health Program. This was a result of the Deadly Ears Program and the Southern Queensland Aboriginal and Torres Strait Islander Ear Health Program being brought together under one governance structure in 2011. The main outcome was a comprehensive review of literature and research as part of the Model of Care. A number of discrete innovative research proposals have been developed outside of the Framework; however, academia, evaluators and professional bodies who could help facilitate research to identify facilitators and barriers to implementing system level enablers such as guidelines, and promote education and health training pathways at state and national levels to include ear and hearing health for Aboriginal and Torres Strait Islander children in curricula, have not been consistently engaged in advancing this objective. Evaluation, and the sharing of information throughout the systems, have been demonstrated in Canada and the United Kingdom to be powerful tools in facilitating system level change, and frontline care providers interviewed in this evaluation indicated they would value improved information. While the Deadly Ears Program is funded for service delivery, at the Framework level, opportunities for funding monitoring and evaluation could be explored. Professional bodies and academia could also be partners in evaluating what works in

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⁸ In the scope of this evaluation, the evaluators have reviewed only the processed Australian Hearing data. The evaluation team did not analyse the raw data as the focus was on the Framework not individual programs.
embedding information about culturally-relevant practices and service model adjustments in curriculum and evaluating the outcomes of teaching on practice.

5.0 Discussion and recommendations

5.1 Steering Committee's activities under the Framework

In this section, a summary of the key achievements of the Steering Committee's activities under the Framework is provided. Appendix 1, the DEDKDC Framework Evaluation Matrix, provides a summary of available data, mapped against the desired outcomes and indicators of the Framework (4).

Key Action Area 1: Prevention

Substantial progress has been made against the achievements for Key Action Area 1. Achievements of note include: training related to nutrition, physical activity and tobacco; engagement with early childhood education, schools and the tertiary education sector; health promotion activities and social marketing campaigns targeting Aboriginal and Torres Strait Islander Queenslanders; and engagement and material development with maternal and child health workers in Deadly Ears program partner communities. Together these complementary activities have been incremental steps towards the overall prevention objectives.

Key Action Area 2: Screening, surveillance and diagnosis

The activities conducted under Key Action Area 2 have enabled progressive steps to be taken in achieving the objectives. The inclusion of ear and hearing health into the Queensland Chronic Disease Guidelines: Child Health Check (94) is a useful step. Other important documents that the Steering Committee has been able to influence include: the Primary Clinical Care Manual (PCCM), the Personal Health Record (the Red Book), and the Child and Youth Practice Manual. These have all had direct relevance. The Annual Report also notes an increased proportion of families and children successfully navigating the referral system and seeing an ear/ hearing specialist. In addition, more communities have access to appropriate screening equipment.
Key Action Area 3: Treatment, care and support

Significant progress towards this KAA has been demonstrated. Particularly important have been the development and dissemination of the Revised Recommendations for Clinical Care Guidelines, and their promotion by the Australian Medicare Local Alliance (AMLA). Training and the ENT services have also been especially relevant to achieving the objectives of this KAA. In terms of support, SAS systems have been distributed to the regions, and kindergarten services have free access to functioning SAS. In addition, the recommendations of the Deadly Ears Program team to improve the acoustic design of kindergarten buildings, and support in the use of SAS, have been accepted and included in the planning specifications.

Key Action Area 4: Partnerships

As above, an important initiative under this KAA has been Revised Recommendations for Clinical Care Guidelines, the Personal Health Record and the addition of ear and hearing health into the Queensland Chronic Disease Guidelines: Child Health Check (94). All Deadly Ears partner communities and their jurisdictions were covered by MOU for the duration of the framework. Other examples of collaboration were training and developing materials, although these were mainly undertaken by the Deadly Ears program in partner communities.

Key Action Area 5: Workforce development

The activities and outputs reported against this action suggest progress has been made towards achieving the objectives for this key indicator. Activities recorded in the Annual Report include the development of the aforementioned guidelines, and some training initiatives with early years’ staff, school level educators and the tertiary sector. An important achievement has been the ongoing collaboration between the Deadly Ears Program and DETE, to incorporate ear and hearing health and teaching strategies for children with hearing impairment into RAIS.

Key Action Area 6: Information and knowledge

The main achievement reported in the Annual Report (2013-2014) (105) was a Model of Care for an integrated service developed by the Deadly Ears Program and the Southern Queensland Aboriginal and Torres Strait Islander Ear Health Program.
5.2 Define service planning opportunities and measurement parameters/structures that will assist on-going service delivery, monitoring and evaluation

For the purpose of this evaluation, defining service planning opportunities relates to Framework activities, not delivery of services. As noted above and in the literature review, it is increasingly recognised that addressing complex issues, such as OM in Aboriginal and Torres Strait Islander populations, requires a systems thinking approach. The complex interaction of multiple risk factors means that action is needed across multiple sectors in order to address the social determinants of ear and hearing health (and improve health more broadly).

A number of factors, or ‘simple rules’, have been identified in the literature for influencing systems change. Some of these have been discussed above, including stakeholder engagement and aligning objectives and leadership at all levels of the system. Other critical factors that have been identified are:

- clear and transparent communication across the system (vertically and horizontally);
- providing feedback to service providers— for example, changes in the proportion of referrals that have accessed higher level care, changes in the incidence of CSOM, what has worked elsewhere and in what contexts.

These practical rules are seen as being ‘where to’ rather than ‘how to’ prescriptions, with the ‘how to’ being developed locally and in partnership with communities (106). Participatory action research (e.g. with service providers in communities and the Deadly Ears program staff) would help to more systematically understand and document what works in influencing system change, and how communities are progressing in addressing OM and its determinants. The Deadly Ears Program has started to use community strategies, and further developing and monitoring these with partner communities and sharing results could be useful in this.

A key action area for the Steering Committee is to advocate for ear health (or health more broadly) in all policies, and especially those that affect Aboriginal and Torres Strait Islander populations. A (ear) Health in All Policies (HiAP) does not mean that ear and hearing health should be at the centre of all policies, but underscores the need for executive leadership and cross-sector collaboration (107). Strategies that have been found to be effective include: developing and structuring cross-sector relationships, joint calls for proposals, cross-sector research and evaluation, use of common systems for data and indicators, and validation of

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9 This is outside of the period of the Framework and not included in the evaluation
(ear) health performance measures. A clear communication strategy is vital in order to build a common vision and language (107).

**Recommendation 1: Service planning**

- Continue to develop and structure cross-sector partnerships across the different system levels (e.g. Steering Committee membership, MOU, temporary working groups for particular issues, communities of practice, service provider engagement and feedback—federal, state, regional, community)
- Advocate for ear and hearing health in all polices that affect Aboriginal and Torres Strait Islander populations, and develop a HiAP guide
- Continue to define common goals or objectives across Steering Committee agencies and across sectors and state government objectives
- Monitor policy trends and proposals and analyse potential impacts from the health/ear health perspective, and negotiate to ensure policies are supportive of health/ear health, especially those related to Aboriginal and Torres Strait Islander populations
- Investigate providing input into non-health and education curriculum (e.g. healthy housing included in curriculum on planning, rural development, Aboriginal and Torres Strait Islander programs)
- Develop a communication strategy for different stakeholders with common messages across sectors, in addition to continuing Annual Reports
- Continue to establish priorities for action, delineate roles and responsibilities, including sharing expertise and knowledge
- Continue to review and monitor short-term goals related to routine operational work and process objectives, with a focus on continuous improvement

Monitoring and evaluation is an important part of accountability and understanding what worked and why, as well as benefits (intended or unintended) and any inadvertent harm. Under the next section related to strategic direction statements, KAA, individual actions and performance indicators, a number of potential activities, output and outcomes indicators are identified. An important task of the Steering Committee in developing the new Framework will be considering these recommendations and selecting which ones should be actioned, when and which should be prioritised based on resources and common goals and objectives, and contextual factors that may influence activities and outcomes and means of verification. It is usually not possible to evaluate all activities and potential outcomes (benefits), so the Steering Committee will need to determine priorities.

A minimal dataset of indicators on ear health related practices at different levels of the systems (with health and education as initial priorities), encompassing both individual and
school and health services level variables, should be developed so that change can be monitored over time as different policies and programs are introduced, with feedback to stakeholders provided in accessible formats for different stakeholder groups. Once agreement has been reached on standardised minimum data sets, then data collection and management should be integrated into existing surveillance programs.

Monitoring of the Framework involves monitoring and systematically documenting the key aspects of the Framework’s processes (e.g. Are they working as expected? Why/Why not? Do they need to be modified?), and monitoring of how the actions defined in the Framework are being implemented (Are they being implemented as expected? Why/Why not? Where are they being implemented? Have they been modified by stakeholders?). It is a systematic and continuous process of monitoring certain aspects of the Framework’s process which could indicate how well the Framework is performing, allowing for regular feedback and modifications guidance.

Evaluation of the Framework and system change is challenging, due to the complex and dynamic nature of systems. This makes it quite different from evaluation of discrete activities, where experimental or quasi-experimental methods or quantitative outcome indicators can be used (108). Theory-based logic models are useful in this context and are likely to change over the lifespan of the next Framework, as a more nuanced understanding of how implementing ear and hearing health into all policies develops. This is because causal chains are often not linear, are influenced by context, happen over time and involve negotiation and feedback (109). In South Australia, an evaluation of HiAP included participatory action research, use of a logic model to assess contribution to outcomes, and a focus not just on what worked, but also an examination of how and why it worked and what contextual variables enabled or acted as barriers to it working (110). The intent is not to establish causality, rather a ‘burden of evidence’ that supports logically coherent chains of relations from activities to outcomes by using a range of evidence. The intent is to test the assumptions that underlie the program theory.

Program theories make explicit stakeholders’ perceptions about the relationships between an initiative’s strategies, interim outcomes and longer-term outcomes. It produces testable assumptions regarding those relationships at each level of the system: for example, if we provide quality training to health professionals working in Aboriginal and Torres Strait Islander communities in the clinical guidelines, and trainees are motivated to learn, they will know how to apply the guidelines; if trainees’ workplace is supportive and families agree, they will be able to apply the guidelines, and so on. These theories are often depicted
Program theory provides a particularly valuable tool in evaluating system level change, where initiatives are complex with many strategies in play (109, 110, 111). A robust theory of change will recognise that the same activities may produce different outcomes for different people or organisations. It will help to show how the different levels interact to achieve outcomes, and help to disentangle the contributions of the Framework in improving ear and hearing health from other actions. The approach can be particularly useful when there is no baseline data, as it allows the evaluator to examine the plausibility of the linkages between activities, outputs and outcomes, and to take into account contextual variables in assessing the program (or Framework) contribution to observed outcomes. The role of monitoring and evaluation in this approach is to test the initiatives underlying assumptions.

Examples of potential monitoring and evaluation tools and sources of evidence

### Outputs

- **Possible measures**: number of materials produced; number of materials distributed and to whom; number of people trained; decreases in CSOM incidence; decreases in OM and prevalence; the number of Aboriginal and Torres strait Islander children who are checked following recommended guidelines for child ear health checks; number of schools making acoustic modifications to classrooms; number of relevant tertiary educational institutions including ear health and culturally-appropriate strategies in their curriculum in a systematic manner; specific references to ear health in child health and education policies; proportion of providers having completed ear health assessment training within x months of commencing work; proportion of schools and child care centres with specific reference to ear health/conductive hearing impairment in standards of practice; development and implementation of a communication strategy; number of times practice guidelines disseminated to relevant professional networks; extent to which Steering Committee members feel that performance measures have been co-developed; level of understanding of the impact of policies on ear and hearing health beyond the health sector.

- **Possible sources of evidence**: distribution records, training records, references to ear and hearing health in policies, minutes of meetings, Annual Reports, observation, partner organisation Annual Reports, clinical records, review of curriculum in different universities/TAFE, self-report surveys, e.g. knowledge, attitudes and practice survey, routine health facility reporting system.

### Monitoring and surveillance methods

- Semi-structured interviews with key political and other non-bureaucratic actors who have knowledge of the Framework and policy, Steering Committee members, senior executives

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10 Similar process, measures and tools can be used at the start of the Framework to develop a baseline based on priorities identified by the Steering Committee.
from health and partnering sectors, service providers, community members, self-report surveys;

- Case study analyses for a detailed understanding and checking of the hypothesis in the program theory;
- Online surveys of policy stakeholders, Steering Committee members, senior executives from health and partnering sectors, service providers, community members (These can be one-off or cyclic to see how knowledge and attitudes change).

Outcomes can be assessed using the following criteria:

**Relevance**

Relevance is the extent to which each output is suited to the priorities and policies of the target group, and government objectives. Questions to guide evaluation of relevance include:

- To what extent are the objectives of the Framework still valid?
- Are the activities and outputs of the Framework consistent with the overall goal and the attainment of its objectives?
- Are the activities and outputs of the Framework consistent with the intended impacts and effects?

**Effectiveness**

This is a measure of the extent to which an activity meets its objectives. In evaluating the effectiveness of the Framework, it is useful to consider the following questions:

- To what extent were the objectives achieved/are likely to be achieved?
- What were the major factors influencing the achievement or non-achievement of the objectives?

**Efficiency**

Efficiency measures the outputs—qualitative and quantitative—in relation to the inputs. When evaluating the efficiency of the Framework, the following questions could be included:

- Were activities cost-efficient?
- Were objectives achieved on time?
- Were the Framework activities implemented in the most efficient way compared to alternatives?
Impact

Impact measures the positive and negative changes produced by the Framework, directly or indirectly, intended or unintended. When evaluating the impact of the Framework, the following questions could be included:

- What has happened as a result of the Framework?
- What real difference has the Framework made to the beneficiaries?
- What would have happened without the Framework?

Sustainability

Sustainability is concerned with measuring whether the benefits of the Framework are likely to continue without the Framework. When evaluating the sustainability of the Framework, it is useful to consider the following questions:

- To what extent are the benefits of the Framework likely to continue if the Framework no longer exists?
- What were the major factors which influenced the achievement or non-achievement of sustainability of the Framework?

5.3 The role and membership of the Steering Committee

Over time, the Steering Committee’s preferred mode of operation has evolved, with separate sector-specific working groups meeting to progress complementary, but separate, agendas. This has occurred mainly because of the breadth of the agenda which was seen as too broad for a single committee, and to enable more focused meetings. The outcome is that the Steering Committee constitutes representatives of stakeholder organisations who input into, and report on, the KAA. This current mode of operation has some strengths, but also misses some opportunities, particularly around cross-sector dissemination and diffusion of ideas and inter-sectoral collaboration. While information is shared in the Annual Reports and action plans, these reports break down actions into discrete individual agency actions and do not allow for the complexity of the issue to be discussed. Importantly, they do not integrate relationships and knowledge sharing across multiple levels (e.g. federal, state, regional, community) and agencies (e.g. public, private, civil society), or encourage the on-going shared articulation of common values and agreement on problem definition and solutions that are critical elements in interventions designed to produce systems change effectively (57,106,112).
A number of players seem to be missing from the Steering Committee. In particular, due to changes in Queensland Health, the current Steering Committee does not include a maternal and child health representative. Given the importance of maternal and child health in preventing OM, and the benefits of early detection, finding a representative from the relevant new unit in Queensland Health, or a representative from outside of Queensland Health, is seen as critical. The Framework does not include indicators for engaging strategically with regional health and education departments, community-based organisations or, importantly, community health action groups or health councils (where they exist) and affected communities.

Engagement at the service provider level in communities has been primarily through the Deadly Ears Program, and opportunities exist for higher level strategic engagement through the Framework. Governance structures that integrate relationships, including service providers and consumers, and create strong and effective linkages across system components, are the most effective (57, 63, 106, 112). Elsewhere, evaluations of system change initiatives have demonstrated the importance of leadership, commitment and follow-up at central, regional and community level. High-level senior support has been found to be particularly important in removing barriers, advocating upstream (e.g. to COAG) and facilitating a system approach, even though these senior leaders are unlikely to be involved in the day-to-day decision-making processes.

Currently, input into tertiary level providers relies heavily on people within the Deadly Ears Program and is not sustainable. Academic partners and professional bodies can assist in facilitating education and health training pathways at state and national level to improve ear health for Aboriginal and Torres Strait Islander children. The Steering Committee should identify academic bodies with whom the Deadly Ears Program already has established relationships, and which have a relatively high number of students who are likely to work with Aboriginal and Torres Strait Islander populations. Having experience and contacts in the tertiary level sectors, the representative could advise on learning design and on a strategy to influence systematic inclusion in the curriculum of ear and hearing health for Aboriginal and Torres Strait Islander children. The Steering Committee could work with an academic advisor(s) to develop a communication strategy state-wide. This could be through a mix of commentary or research published in relevant educational journals, press releases and so forth. In addition, policies are often developed with input from academics, so identifying academics influencing Aboriginal and Torres Strait Islander policy is also important, and these academics can be invited to act as advisors to, or be part of, the Steering Committee.
**Recommendation 2: Steering Committee membership**

The Steering Committee should explore different options to identify how other important stakeholders—including high level executives in health and education, regional level (hospital health services (HSS) and education regions) managers, Aboriginal and Torres Strait Islander representatives—can be further engaged. This should include identifying a representative from the relevant new unit in Queensland Health’s Department of Health, or a representative from outside of the Health Department, who can represent maternal and child health stakeholders (e.g. Maternity and Neonatal Clinical Network).

The Steering Committee should identify professional bodies and academic bodies with whom the Deadly Ears Program already has contacts, to build on these relationships and systematise ear and hearing health in relevant tertiary level curriculum. One way to identify potential candidates to fill gaps would be to issue a call for expressions of interest through the Steering Committee’s networks. Alternatively, the Steering Committee may also invite people whom they think would add value to the Steering Committee, either due to their particular expertise or their networks and/or sphere of influence.

Prior to identifying candidates, a term of reference should be developed outlining roles and responsibilities, expected time commitment, and so forth.

Some of the Steering Committee members reported that the actions that would receive the greatest attention were more likely to be where their organisational objectives were perceived to be more specifically aligned with the Framework. When this alignment occurred, it made actions more relevant and contributed to further progress towards overall objectives and mutual accountability. While some of the objectives in the Framework were aligned to ‘Making Tracks’, developing a common language and shared objectives aligned to personal and organisational strategies has been found to be an effective strategy in managing some of these tensions (106, 112).

Based on the system change literature and the decentralisation of services in Queensland, for a state-wide impact the evaluation team proposes a governance structure that encompasses central, regional and local levels with strategies, objectives and accountability mechanisms at each level across health. A key challenge in a broader engagement approach is bridging professional cultures, and can involve trade-offs in real or perceived relevance and efficiency in meetings, particularly in resource-constrained contexts.

The proposed governance structure suggests a higher level executive function that meets two to three times a year to review progress on the Framework. The executive function has responsibility for advocating and influencing state and federal level policy to promote ear and
hearing health and the social determinants of disease including ear and hearing health, in all policies and, particularly, those that affect Aboriginal and Torres Strait Islander populations. It is not envisaged that the executive level will be involved in day-to-day decision-making related to the Framework. Rather, their delegates will sit on the Steering Committee that operationalises the Framework below the executive. These delegates should report to the executive. We recommend that the Steering Committee meets quarterly to coordinate and collaborate, where possible, to work towards organisational and partnership goals. This does not preclude smaller sector-specific meetings, working groups or key individuals (or teams) assuming responsibility for specific strategic projects. These smaller working groups may disband once a specific project has started, or may continue to work on other projects.
**Recommendation 3: Governance structure**

The recommended governance structure is described in figure 4.

**Figure 4 Proposed governance structure for the Framework**

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<thead>
<tr>
<th><em>COAG / COAG councils</em> (Councils on Health and education)</th>
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<tr>
<td><em>Ministerial advisory councils</em></td>
</tr>
<tr>
<td>Australian Health Ministers’ Advisory Council (AHMAC); Qld is represented on AHMAC by the Director-General of Health</td>
</tr>
<tr>
<td>Ministerial Advisory Council for Childcare and Early Learning; Qld representatives: Executive Officer, Children’s Activity Network and President, Australian Childcare alliance; CEO childcare Qld</td>
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</tbody>
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<tr>
<th><strong>Executive level</strong></th>
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<tbody>
<tr>
<td>Includes: Queensland Health; DETE executive (specifically ECEC and State Schools), Ministers for Health and Education, Health and Hospital Services (relevant), and Deadly Ears.</td>
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</table>

*The executive’s role is to ensure that the Steering Committee meets a range of high level stakeholders who can influence system change. It is responsible for policy briefs and reporting to relevant Ministers, advocacy and influencing system behaviour, promoting ear and hearing health and the social determinants of disease particularly related to ear and hearing health, in all policies, and particularly those policies that affect Aboriginal and Torres Strait Islander populations.*

*Meets two to three times per year.*
Sector – DEDKDC steering committee

Membership: DE program director; QAIHC / the AMS sector, Australian Hearing, Department of Health and Ageing’s Indigenous and Rural Health Branch; Queensland Health Communicable Diseases and Preventive Health Unit, Aboriginal and Torres Strait Islander Health Branch, Maternal and Child Health Representative, EQ and ECEC, representing work under the five sectors:

- Preventative health:
  - Nutrition
  - Environmental health
  - Smoking cessation
  - Housing
- Early childhood:
  - Children and families centres
- Schools
- Maternal and Child Health
- Workforce development:
  - Universities
  - Professional bodies/registration boards
  - TAFE

The Steering Committee is responsible for oversight, operationalisation and monitoring of the Framework. It reports to the executive and in Annual Reports. It is responsible for undertaking annual participatory reviews and planning. Meets quarterly.

Ad Hoc working groups

Ad Hoc working groups convene as required, and communities of practice (which may, for example, consist of direct service providers, Partner Community representatives, or regional stakeholders) to facilitate collective learning. Specific focus and tasks can be devolved from Steering Committee or be generated out of direct community engagement.

Direct community engagement

**Direct community engagement**

Stakeholders: Local Aboriginal and Torres Strait Islander elders and/or health council representatives; Deadly Ears program staff from health promotion and allied health teams; Deadly Ears ‘Walk in Country’ ENT teams; participating community agencies; local health council; sector representatives (health and education);

- EDON in hospital boards HHS;
- Medicare Local representatives (or replacement)

Direct community engagement with community service providers and advocacy.

*Reporting line only ** Recommended stakeholders. The DEDKDC Framework Steering Committee to determine based on consultation
MOU covering Deadly Ears partner communities and their jurisdictions, and more recently with DETE (to replace a DEDKDC/DETE action plan), have been a useful tool in cementing relationships and inter-sectoral actions. Opportunities exist for the MOU to be more specific about potential activities, to ensure the inclusion of ear and hearing health. Further, key stakeholders who are instrumental in their application, are not necessarily aware of the presence of MOU or the responsibilities contained therein. The Steering Committee should also explore ways to work with the relevant HHS to determine how best to communicate the responsibilities contained in the MOU to key stakeholders who are instrumental in their implementation. This is important in terms of helping to convey a real commitment to the initiative, and is likely to increase buy-in, even if staff members face some contextual barriers in implementing them. Regional coordination and action, with HHSs, Medicare Local partners (or their future replacement) and Education Queensland (EQ) regional offices, need to ensure strong relationships, goal alignment and coordinated actions.

Recommendation 4: MOU

Identify opportunities in MOU for being more specific about potential activities, to ensure the inclusion of ear and hearing health in partner activities. Develop with partners a communication plan to disseminate information to relevant service partners related to the content of the MOU and responsibilities contained therein.

5.4 The relevance of the strategic direction statements, key action areas, individual actions and performance indicators described in the Framework

Key Action Area 1: Prevention

Summary

The Framework usefully reinforces the need for multiple levels of influence and multiple strategies (e.g. education, policy, environmental health) in prevention. Significant progress on performance indicators for stakeholder ear and hearing health education, parenting support, social marketing campaign and health promotion activities have all contributed to meeting objectives set against KAA 1. However, evidence from this evaluation suggests that progress on activities under KAA 1 of the Framework have been hampered by a number of significant barriers. Primary healthcare services were sometimes fragmented in communities with multiple providers trying to address needs (but still with some significant gaps), making the task of establishing a strong network and coordination of local prevention activities challenging. Links with the Preventative Health Unit (PHU) within Queensland Health have previously played a stronger role in driving some of the primary prevention strategies,
and was seen as an ‘obvious partner’ to lead this work through their work force and networks. This link still exists, but capacity to pursue a shared agenda in this space has been significantly weakened by Queensland Health resource cuts and public health work force downsizing. This has left OM primary prevention and upstream public health action through Queensland Health services poorly resourced and with inadequate work force capacity. Finally, some of the indicators are too specific (e.g. Framework pg. 24 - Parenting support, engage staff to support families with infants and children with complex needs, including: nine Indigenous young-parents’ support workers and resources; twenty-two Indigenous child health workers in schools; seven early intervention psychologists and/or social worker). These numbers came from a program that existed in 2009 (4), which is now redundant and not relevant for the new Framework.

Given the continuing high prevalence of OM, the KAA of prevention remains pertinent. Taking into consideration the restructure of Queensland Health, the Steering Committee needs to explore new ways of influencing prevention activities, and specifically developing links with HHSs, Royal Flying Doctor Services, primary healthcare services and Medicare Local (or their replacement). Rather than one way communication social marketing materials, the focus should be on developing innovative, culturally-appropriate, visual communication materials for service providers to engage in face-to-face discussion with families and their children when they present (for ear health or other needs). The emphasis should be on adopting healthy lifestyle behaviours to improve hygiene, nutrition, breastfeeding rates, immunisation rates and decrease smoking rates, with providers having linkages and referral pathways to programs such as Quit Smoking For Life.

**Recommendation**

**Key Action Area 1: Prevention**

The KAA should be refocused to:

**Objective 1:** Aboriginal and Torres Strait Islander populations and service providers in Queensland are aware of OM, associated conductive hearing loss, and the determinants of ear and hearing health and are taking preventative action to minimise the incidence.

Example outcomes

- Decreases in levels of behavioural risk factors associated with OM in Queensland Aboriginal and Torres Strait Islander populations;

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11 Activities and indicators are indicative of what could be included, but activities and outcomes need to be decided upon and prioritised by the Steering Committee
Reduction in negative outcomes due to poor ear and hearing health practices in Queensland Aboriginal and Torres Strait Islander populations; Increased capacity of individuals and groups to take action to improve ear and hearing health in Queensland Aboriginal and Torres Strait Islander populations.

*Example intermediate outcomes*

- Changes in knowledge and/or skills to prevent and manage OM (service providers and affected population);
- Increased uptake of preventative behaviours;
- Increased understanding of what materials work.

*Example outputs*

- Number of providers reporting to be using materials;
- Number of people provided with training;
- Number of new materials developed;
- Quality of new materials (for example with reference to purpose, relevance etc);
- Number of participatory community-based activities;
- Number of cross-sectoral activities.

*Example activities*

- Continuing to use, and develop where needed, innovative, culturally-appropriate, visual communication materials for service providers to engage in face-to-face discussion with families and their children when they present (focus health lifestyles, including ear and hearing health) to develop personal skills to address ear and hearing health;
- Participatory community-based activities that engage communities in defining the program and identifying realistic solutions;
- Identifying ways to engage cross-sectorally with issues that affect ear and hearing health;
- Continuing to provide training to ensure consistent, safe and effective ear and hearing health promotion practice across all service providers;
- Collating, analysing and disseminating evidence of effectiveness of interventions.

*Tools used in the Care for Kids Ears evaluation could be used or adapted for this for baseline and on-going monitoring of changes*

**Key Action Area 2: Screening, surveillance and diagnosis**

**Summary**

Improvements in access to equipment, and increased staff training in the use of equipment, are documented. There is also some evidence of increased rates of attendance at child health checks and increased rates of screening, identification and referral associated with
OM. However, in the absence of a state-wide monitoring system, it has not been possible to verify or measure the extent of these increases. Effective cross-disciplinary relationships with DETE have fostered innovations in school surveillance. Additionally, there is strong recognition that screening and surveillance programs need to reach children before they commence school, and that this now needs to be a high priority. This will require the delivery of outcomes through close collaboration with the early childhood sector and playgroups, which will play a critical role. Best practice models for screening and surveillance have shifted and, while updating of practices is apparent in the implementation plan and through interviews with members of the Steering Committee, perceptions of community stakeholders have not been updated. This action area needs to be revised to reflect current best practice, with the emphasis on surveillance (continuous analysis, interpretation and feedback of systematically-collected data) and early diagnosis.

**Recommendation**

**Key Action Area 2: Surveillance and diagnosis**

The KAA should be refocused to:

**Objective 1:** Aboriginal and Torres Strait Islander children have access to appropriate standardised surveillance and diagnostic services to effectively manage OM and associated conductive hearing loss.

Example outcomes

- Standardised application of surveillance, diagnosis and treatment protocols;
- Prevalence data available, analysed, interpreted, disseminated and used to inform planning;
- Decreased prevalence of OM, CSOM and associated conductive hearing loss.

*Example intermediate outcomes

- Changes in knowledge and/or skills/environment based on Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis;
- Alignment with the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis;
- Increased understanding of the contextual factors that facilitate or act as barriers to implementation of the Guidelines.

Example outputs
- Standardised state-wide surveillance system in relation to OM and associated conductive hearing loss;
- Alignment with the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis included in job descriptions;
- Number of providers using the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis.

Example activities

- Continue to advocate for a standardised state-wide surveillance system or, alternatively, a means of sharing information between systems, and agreement on protocols, so that each organisation is collecting comparable data to enable measurement of OM and associated conductive hearing loss prevalence, and the impact of prevention and treatment programs in Queensland Aboriginal and Torres Strait Islander populations;
- Explore ways to harvest data on OM and associated conductive hearing loss from existing primary healthcare provider data into a standardised state-wide database;
- Continue to develop capacity of health practitioners (e.g. remote area nurses, nurse practitioners (NPs), community health nurses or Aboriginal health workers) to align practice with the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis;
- Continue to advocate for supportive environments—including home, school, community, health centre, food system and policy environments—for Aboriginal and Torres Strait Islander populations, and inclusion of following the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations in relevant health staff job descriptions;
- Collate, analyse and disseminate surveillance data in accessible formats at all levels of the system.

*Baseline can be developed and changes monitored and evaluated using surveys, face-to-face or online.

Key Action Area 3: Treatment, care and support

**Summary**

Activities under the Framework described in this section included a range of innovations in treatment, care and support practices. What is now needed is an evaluation, dissemination and, where appropriate, a scaling-up plan to ensure activities and initiatives, which have proven benefits, can be introduced more widely to remote communities. Deadly Ears Program staff members are integral to these processes, as the implementers of these activities, and for dissemination of findings back to communities. However, it is advisable
that this information be fed back into a communication strategy, where ownership of the findings is shared, and community representatives are active contributors to evaluation and dissemination. This suggested change has the potential to engage a wider range of stakeholders to promote understanding of ear and hearing health issues, and to keep these issues on local, regional and state agendas.

**Recommendation**

**Key Action Area 3: Treatment, care and support**

The KAA should be refocused to:

**Objective 1:** Queensland Aboriginal and Torres Strait Islander children and families have access to appropriate specialist and mainstream services to treat and manage OM and associated conductive hearing loss.

**Example outcomes**

- Improved reported rates of treatment following guidelines;
- Increased proportion of referred children are seen by specialists, including ENT, audiology, child development, and other allied health professions;
- Decreased impact of OM and associated conductive hearing loss in Queensland Aboriginal and Torres Strait Islander children.

**Example intermediate outcomes**

- Changes in knowledge and/or skills/environment based on Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis;
- Alignment with the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis;
- Increased understanding of the contextual factors that facilitate or act as barriers to implementation of the guidelines;
- Increased access to referral pathways.

**Example outputs**

- Adherence to the Recommendations for Clinical Care Guidelines (RCCG) on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis, or other systems that align with the RCCG, included in job descriptions;
Number of providers using the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations, or other systems that align with the RCCG, for surveillance and diagnosis;

Aboriginal and Torres Strait Islander families and service providers are aware of, understand, and are able to access referral pathways.

Example activities

- Continue to increase capacity of health workers (e.g. remote area nurses, nurse practitioners (NPs), community health nurses or Aboriginal health workers) to coordinate clinical management and follow the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations, and develop management plans with families including treatment compliance;
- Continue to advocate for supportive environments and inclusion of following the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations in relevant health staff job descriptions;
- Continue to develop clear and accessible referral pathways;
- Collate, analyse and disseminate evidence in accessible formats at all levels of the system.

**Objective 2:** Queensland Aboriginal and Torres Strait Islander children and families, affected by OM and associated conductive hearing loss, receive appropriate learning and development support (focus early years and school-aged children)

Example outcomes

- Improved learning outcomes in project areas.

**Example intermediate outcomes**

- Changes in teaching practices to support learning for children with poor ear or hearing health;
- Changes in school attendance;
- Changes in student behaviours.

Example outputs

- Number of people who are aware of lessons learned from pilot projects in the Deadly Ears program partner communities;
- Number of schools with embedded standards of practice that encompass delivery of appropriate learning and development support to children affected by OM and associated conductive hearing loss;
- Number of schools that have implemented new building policies that account for acoustic environments;
- Number of schools that provide increased support from Advisory Visiting Teachers – Hearing Impairment (AVT–HIs);
- Uptake of effective pilot projects in other communities;
- Evaluations of pilot projects.

**Example activities**

- In partner communities, pilot, monitor, evaluate and disseminate lessons learned widely across the system projects designed to support learning (e.g. classroom acoustic project);
- Scale up effective pilot projects across the state;
- Evaluate effectiveness of scaled-up projects.

*Baseline can be developed and changes monitored and evaluated using surveys, face-to-face or online*

**Baseline can be developed and changes monitored and evaluated using surveys, face-to-face or online, semi-structured interviews with key stakeholders, case studies, observation**

**Key Action Area 4: Partnerships**

**Summary**

Important activities under KAA 4 included contribution to the revisions of the Personal Health Record and the Primary Clinical Care Manual that align clinical ear and hearing assessments with the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations (14), the inclusion of guidelines for child ear health checks in the Queensland Chronic Disease Guidelines 3rd edition 2010 (94), and contributing to the Australian Government’s Care for Kids Ears National Campaign\(^1\). These documents have been widely distributed and advocated. The evaluation identified a number of supply- and demand-side factors that have the potential to influence the consistent application of the guidelines, and over which the Steering Committee has no direct control. These include the number of people involved in service delivery related to ear and hearing health, access to referral pathways, and competing priorities and incentives (financial and/or non-financial). For example, health and educational staff members work under the influence of their own structural and institutional arrangements that shape practice.

Limited evidence is available of actions to increase implementation of community-based environmental health programs, or the implementation of animal management plans. This is probably due mainly to the aforementioned restructuring of Queensland Health. Similarly,

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\(^1\) The Care for Kids’ Ears campaign has been designed and produced by the Australian Government to increase awareness of OM and hearing loss in Aboriginal and Torres Strait Islander populations. [http://www.careforkidsears.health.gov.au/internet/cfke/publishing.nsf](http://www.careforkidsears.health.gov.au/internet/cfke/publishing.nsf)
due to changes in Queensland Health, the current Steering Committee does not include a maternal and child health representative. Developing strategic partnerships is core to health promotion and remains relevant.

Recommendation

Key Action Area 4: Partnerships

The KAA should be refocused to:

Objective 1: Effective and collaborative relationships between Queensland Aboriginal and Torres Strait Islander populations and government and non-government agencies involved in delivery of services impacting on ear health.

Example outcomes

- Improved environments—including home, school, community, health centre, food system and policy environments—supportive of ear and hearing health in Queensland Aboriginal and Torres Strait Islander populations;
- Increased capacity of service providers to take action to develop supportive ear and hearing environments among Queensland Aboriginal and Torres Strait Islander populations;
- Increased system-wide responsibility for ear and hearing health related to Queensland Aboriginal and Torres Strait Islander populations.

*Example intermediate outcomes

- Changes in practice relevant to responsibilities contained in MOU;
- Changes in capacity within local populations, and non-government service providers address ear and hearing health and ensure supportive environments;
- High quality of partnerships.

Example outputs**

- Number of MOU signed that outline responsibilities;
- Number of people in the relevant organisations aware of MOU (focus on people who are responsible for implementation);
- Number of partnerships at the different levels of the system;
- Number of capacity-building initiatives.

Example activities

- Continue to build the capacity within local populations and non-government service providers to address ear and hearing health and ensure supportive environments;
- Continue to build leadership and commitment at all levels of the system (federal, state, regional stakeholders and local community) to support ear and hearing health;
- Maintain and develop partnerships with local communities, as well as government and non-government service providers, to promote supportive environments (including home, school, community, health centre, food system and policy environments) for Aboriginal and Torres Strait Islander populations;
- Continue to develop processes (e.g. MOU) to support partnership development, including governance options and identification of contextual enablers and barriers;
- Collate, analyse and disseminate evidence of effectiveness.

*Baseline can be developed and changes monitored and evaluated using surveys, face-to-face or online, semi-structured interviews with key stakeholders

**Steering Committee to determine most appropriate numbers for quantitative outputs, based on their knowledge of available resources and their knowledge of the potential number of appropriate partners. The Steering Committee may decide to set a target number or decide to target specific organisations or types of organisations

## Key Action Area 5: Workforce development

### Summary

Progress on performance indicators for KAA 5 has included provision of ear health guidelines for clinicians and health professionals described above, and professional development initiatives. AVTs and Deadly Ears staff members also provide professional development and support for educators, and a number of other professional development trainings have been completed. There is insufficient evidence to state whether or not the activities conducted under the Framework have contributed to staff retention. One issue that the evaluation has highlighted is that not all providers are able to consistently implement the Primary Clinical Care Manual and the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations (14), or the guidelines for child ear health checks in the Queensland Chronic Disease Guidelines 3rd edition (94). This includes, but is not limited to, AICCHS providers and other community-based providers, such as Medicare Locals or Primary Health Networks. Another issue identified by the evaluation is that staff members working in Aboriginal and Torres Strait Islander communities for the first time are often under-prepared and can be from other states, meaning that federal level policies are essential in ensuring an evidence-based approach to improving ear and hearing health. Another issue is that while recommendations of best practice have changed, qualitative evidence suggests that perceptions and understandings of community stakeholders and service providers have not been modified. For example, service providers continue to feel that screening is an effective measure.
The Steering Committee should engage more systematically with workforce trainers and service providers to develop skills in the detection of OM, as well as the effect of smoking in pregnancy and the benefits of breastfeeding based on current guidelines. Training indicators need to go beyond number of people trained to consider where those trainees are deployed, and how they are able to transfer training to the workplace.

Having a well-trained workforce is essential in the on-going detection and management of OM, and this action area remains salient. Including prevention, detection and management of OM in the syllabus for health and educators working with Aboriginal and Torres Strait Islander populations remains key. A special emphasis should be on maternal and child health nurses, clinicians and educators. Any indicators of the number of people to be trained should be based on an assessment of need, providing a clear rationale.

**Recommendation**

**Key Action Area 5: Workforce development**

The KAA should be refocused to:

**Objective 1:** Queensland Aboriginal and Torres Strait Islander populations have access to a sufficient and appropriately-skilled workforce that provides services that impact on ear and hearing health.

Example outcomes

- Inclusion of ear and hearing health in the syllabus for health workers and educators working with Queensland Aboriginal and Torres Strait Islander populations, with a particular focus on primary and public health workers, early years and school-age educators;
- Improvement in ear and hearing health-related behaviours;
- Increased capacity of service providers in Queensland to take action to improve ear and hearing health;
- Early detection and management of OM and associated conductive hearing loss in Aboriginal and Torres Strait Islander children in Queensland.

* Example intermediate outcomes

- Changes in knowledge and/or skills/environment and follow the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis;
- Alignment with the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis;
- Increased understanding of the contextual factors that facilitate or act as barriers to implementation of the guidelines;
- Increased access to access referral pathways.

**Example outputs**

- Adherence to the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis included in job descriptions;
- Number of providers using the Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations for surveillance and diagnosis;
- Number of capacity-building initiatives;
- Number of providers and community members aware of referral pathways.

**Example activities**

- Continue to build the capacity within education and health settings to deliver innovative, culturally-appropriate, visual communication materials for service providers to engage in face-to-face discussion with families and their children when they present (focus on healthy lifestyles including ear and hearing health);
- Promote supportive work environments where service provider employees have an ear and hearing promoting function in their job description;
- Ensure resources for referral pathways for children suspected of having OM are disseminated and understood by staff within education and health settings;
- Enhance primary healthcare capacity to implement a coordinated, systematic approach to opportunistic early detection and management of OM;
- Continue to build, disseminate and promote evidence-based practice and strategies to the workforce in Aboriginal and Torres Strait Islander populations;
- Continue to develop resources and promote the inclusion of ear and hearing health in the syllabus for all health workers and educators working with Aboriginal and Torres Strait Islander populations, with a particular focus on primary and public health workers, early years and school-age educators;
- Communicate new evidence and best practice to the workforce.

*Baseline can be developed and changes monitored and evaluated using surveys, face-to-face or online*
Key Action Area 6: Information and knowledge

Summary

A number of discrete innovative research proposals have been developed outside of the Framework. Overall, however, research, monitoring and evaluation do not seem to have been given high priority in the Framework. The Steering Committee will need to identify what resources are currently available for this, and opportunities for further resourcing. Evaluation, and the sharing of information throughout the systems, have been demonstrated in Canada and the UK to be powerful tools in facilitating system level change, and frontline care providers interviewed in this evaluation indicated they would value improved information. Monitoring and evaluation is also a critical tool in understanding not only what works and what the benefits are (intended or unintended), but also making sure that interventions do no harm. This is particularly important in populations that have experienced marginalisation and the imposition of top-down policies. While the Deadly Ears Program is funded for service delivery, at the Framework level opportunities for funding, monitoring and evaluation should be explored. Professional bodies and academia could also be partners in evaluating what works in embedding information about culturally-relevant practices and service model adjustments in curriculum, and evaluating the outcomes of teaching on practice.

In addition, while the current Framework contains output level indicators, there are no outcome indicators, or an articulated “theory” (or idea), of how the Steering Committee actions are expected to translate into benefits for Aboriginal and Torres Strait Islander children’s ear and hearing health, or what contextual factors might influence the ways in which Steering Committee actions generate outcomes (positive or negative, intended or unintended). In order to adequately capture the effects of the Steering Committee work, outcome indicators are required at multiple levels (e.g. state and local policy, service provision, communities).

Recommendation

Develop a ‘program theory’ or ‘program logic’ for the Framework, based on the KAA. This should be done through a consultative, participatory process as part of developing the next Framework. The program theory should be developed based on the key action areas, taking into account the different actions and desired outcomes at each level of the system. Developing program theory should be seen as an opportunity for consensus-building among key stakeholders. It should be used to develop and budget a monitoring and evaluation plan. Monitoring and evaluation can track results from activities through to outcomes. Lessons learned from the monitoring and evaluation should be used to
collaboratively revise activities. This is also an effective means of maintaining service provider engagement and promoting ownership, a key aspect in applying new knowledge.

There is limited participatory research included in the current Framework; yet this is essential in terms of stakeholder buy-in and ensuring the correct questions are asked, the relevant evidence is identified and receptivity of findings. Participatory research can also enhance credibility through the co-production of new knowledge by both researcher producers and research users.

Given the history of activities under the Framework to date, there exist opportunities to pursue a broad research agenda complementary to the range of activities under the Framework including, but not limited to, clinical, Aboriginal and Torres Strait Islander public health, health system, program cost-effectiveness and education-focused topics. While the actions of the Steering Committee, and particularly the development of guidelines, have been based on current clinical evidence, what works in terms of rolling out new initiatives is less well understood. Given the Framework is not funded to undertake research, this may mean the Steering Committee identifying opportunities for inter-departmental research and/or seeking partnerships with academic or professional entities to pursue partnership grants. This would help build the evidence base for innovative strategies around ear and hearing health, and provide a rigorous approach to tracking progress. Information sharing-mechanisms and feedback loops should be developed at each level of the system, so that the improvements and links to service provider outcomes are clearly demonstrated.

**Recommendation**

**Key Action Area 6: Information and Knowledge**

The KAA should be refocused to:

**Objective 1:** A strategic approach to the collation, reporting and use of accurate data, and monitoring and evaluation relating to the ear and hearing health of Aboriginal and Torres Strait Islander populations in Queensland.

Example outcomes

- Improved information on what interventions work in what contexts in detecting, treating and managing OM and associated conductive hearing loss in Queensland Aboriginal and Torres Strait Islander children;
- Improved use of data related to detecting, treating and managing OM in Queensland Aboriginal and Torres Strait Islander children;
• Reduction in negative outcomes due to poor ear and hearing health in Queensland Aboriginal and Torres Strait Islander children.

Example intermediate outcomes

• Increased capacity of individuals and groups to undertake participatory research to improve ear and hearing health in Queensland Aboriginal and Torres Strait Islander children;
• Increased understanding of what works, why and in what circumstances.

Example outputs

• Partnerships with academic institutions;
• Participatory research;
• Training provided in research and evaluation skills;
• Number of capacity-building initiatives;
• Program theory and key performance indicators documented;
• Monitoring and evaluation plan;
• Communication strategy developed to disseminate research and evaluation (all levels of the system).

Example activities

• Develop links with academic institutions to connect research with the Framework and outcomes, and promote models of participative research between researchers and those population groups being ‘researched’;
• Provide training in research and evaluation skills and methodologies to allow for service providers to be involved;
• Identify and exploit opportunities for inter-departmental research and/or seek partnerships with academic or professional entities;
• Develop accessible communication mechanisms for stakeholders in different parts of the system to facilitate appropriate knowledge transfer and expedient transfer of learning into policy and practice;
• Build an evidence base of what works in what contexts to support positive environments for ear and hearing health;
• Develop key performance indicators and monitoring and evaluation plans based on program theory;
• Review services against current evidence and research, and support change where relevant;
• Monitor evidence and research into the development of new service models, community engagement models, and data collection methods and tools.
5.5 The level of engagement with partner communities and agencies

Evaluating the level of engagement with partner communities and agencies has been primarily through the development of guidelines, social marketing materials and training materials; advising on the development of, for example, the child health check processes in Queensland; advocating for inclusion of the Primary Clinical Care Manual, the Personal Health Record, the Chronic Disease Guidelines (94) and the Child and Youth Health Practice Manual; and publication of the Annual Reports on the Deadly Ears website. These documents are considered to be of high quality, current, evidence-based and comprehensive. The resources provided through the Framework have provided health professionals and educators with useful tools to assist them in providing information about ear and hearing health to children, families and communities, including service providers. In addition, the Steering Committee has engaged with units within their relevant department (e.g. within health or education). At the service provider level, engagement has also been through the MOU and training. Engagement with service providers in Aboriginal and Torres Strait Islander communities at the Steering Committee level has been less systematic and, in the communities visited, service providers were not aware of the existence of the Framework or responsibilities contained within MOU. Nevertheless, individual agencies and programs—for example, the Deadly Ears Program, QAIHC, Australian Hearing and regional educational offices—have engaged at the community level with service providers, but were not the focus of this evaluation. The evaluation recommends greater Framework engagement at the community level, as well as through the governance structure and through a communication strategy.

5.6 A description of key approaches that have delivered significant benefit, and those that need to be amended

The development of clinical guidelines, the social marketing and training materials, and the revised child health check processes, the Personal Health Record, the Chronic Disease Guidelines and the Child and Youth Health Practice Manual can be expected to deliver over time significant change in the early detection, treatment and management of OM. The provision of training, and inclusion of ear and hearing health in university courses, and materials, such as the Care for Kids Ears campaign and Deadly Kids Can Listen and Learn professional development modules, can also be expected to deliver important benefits. The evaluation of the Care for Kids’ Ears campaign (87), for example, suggested that the campaign had a positive impact on awareness and knowledge of OM in promoting positive help-seeking behaviour. The extent to which these benefits are realised needs to be monitored over time.
Recommendations detailed in Sections 5.3 and 5.4 relate to what needs to happen going forward, including amendments to current practices.

6.0 Limitations

One of the main limitations of the evaluation has been the number of Steering Committee members who responded to the survey and agreed to be interviewed. As a result, evidence on the work of the Steering Committee has come mainly from actions reported in the Annual Reports, which do not allow an in-depth analysis of the process aspects of the Steering Committee, and it is difficult to assess the degree to which the Framework contributed to reported achievements. Similarly, the Annual Reports and other documents reviewed tended not to include robust evidence of how improvements in program actions have delivered significant benefits, and end-users of some of the completed actions were not interviewed. In addition, re-structuring of the health and education departments means that some of the institutional knowledge related to the Framework may have been lost. There is also a risk of recall bias, although the evaluation team tried to mitigate this through triangulation of sources. In the community level interviews with service providers, the evaluation team was introduced to providers through the Deadly Ears Program staff. This was culturally-appropriate and, without this support, it would have been impossible to conduct interviews with community level service providers; nevertheless, it may have introduced an element of social desirability bias; that is, participants may have responded in ways that they perceived to be socially acceptable within the interview context. In addition, while the evaluation focus was the Framework, not the Deadly Ears program, it was often difficult to disentangle Framework and program contributions, further compounded by often quite detailed reporting of program community-based activities. Finally, population level prevalence data is reported to be variable, and clinical data from other providers is not stored in a central database. It was beyond the scope of the evaluation to review data from other providers. A limitation of this is that (processed) clinical data only from the Deadly Ears Program was included in the evaluation, limiting any assessment of the contribution of the Framework in reducing the state-wide prevalence of OM and, in particular, CSOM.

7.0 Conclusion

The aims of this evaluation were two-fold; firstly, to undertake a comprehensive evaluation of the ‘Deadly Ears, Deadly Kids, Deadly Communities 2009-2013’ Framework (4); and, secondly, to draft indicator methods/potential measures for on-going monitoring, including suggestions for the types of baseline measures for effective monitoring and surveillance. In order to meet the evaluation aims, a utilisation-focused approach to the evaluation was
taken, using a qualitatively-driven mixed-method design. The results and recommendations were informed by this approach and the evaluation activities, which included:

- A review of the activities of the Steering Committee under the Framework;
- Identification of planning and measurement opportunities to assist on-going service delivery, monitoring and evaluation;
- A review of, and recommendations on, the role and membership of the Steering Committee;
- A consideration of the relevance of the strategic direction statements, KAA, individual actions and performance indicators described in the Framework;
- An examination of the level of engagement with partner agencies and suggestions of approaches for the next iteration of the Framework.

The evaluation has found that the Framework has delivered a number of significant outputs contributing to its overall objectives. The Framework and the evaluation recognises that simple, stand-alone solutions are unlikely, on their own, to generate substantial gains in reducing the impacts of OM and associated conductive hearing loss. This is because OM and its determinants are complex, and need actions and behavioural changes at different levels of the system in which Aboriginal and Torres Strait Islander children live, play and grow up. As with other complex issues, reducing the prevalence of OM is a long-term endeavour that requires a system thinking approach and increased awareness of the need for an HiAP approach in order to improve ear and hearing health, as well as health more generally. Given the lifelong impacts of OM, continuing to facilitate a cross-sectoral, multi-strategy approach to the prevention, treatment and management of OM is critical.
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