Providing a contemporary child development service to children and families living in rural and remote communities across North Queensland:
The evidence for a new model of care

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1.   Summary

- **CDS Townsville has long provided developmental services to children and families in Townsville and across the Hospital and Health Service more broadly.**

- **While the CDS model of care delivered to children and families in Townsville is contemporary and aligns with evidence informed best practice, the outreach model of care is inefficient, ineffective and dislocated from local service providers.**

- **Population measures of children's development at school entry indicate that geographic isolation and socio-economic disadvantage are associated with higher rates of developmental vulnerability. CDS Townsville outreach locations demonstrate levels of developmental vulnerability significantly higher than state and national averages, yet referral numbers to the outreach service are low.**

- **CDS Townsville has conducted a literature review to develop a sustainable, evidence based model of care to improve HHS-wide access to high quality, integrated, and contemporary specialist child development services, and to improve outcomes for children and families living in rural and remote locations in North Queensland. It is anticipated that the outcomes of this project will have applicability to outreach services in other Hospital and Health Services.**

- **This literature review integrates evidence pertaining to:**
    - **Outreach services to rural and remote communities**
    - **Contemporary multidisciplinary child development practices**
    - **Services to Indigenous children and families**
    - **The use of advanced technologies in service provision**

- **Findings from this review indicate that an evidence informed outreach model of care must be:**
    - **Flexible, innovative and responsive**
    - **Regular and predictable**
    - **Child and family centred**
    - **Transdisciplinary**
    - **Built on existing local services**
    - **Individualised to the needs of the child and their community**
    - **Promote cross-agency collaboration**
    - **Inclusive of emerging technologies**
    - **Culturally safe and sensitive**

- **Original findings from THHS rural and remote community stakeholders:**
    - **Limited access to allied health professionals**
    - **Child psychology/ social work services were identified as most lacking service**
    - **Speech pathology/occupational therapy/ physiotherapy and visiting paediatrician equally lacking.**
    - **"Parents understanding their child's needs", "increased frequency of visits", "communication with existing services (including day care and education department)", "screening clinics" and "transdisciplinary assessments" identified as most important contributions of a child development service.**
    - **A collaborative and culturally appropriate service is required.**

- **Evaluation of Three Month Interim Model:**
  - **Increased frequency of visits and allied health services led to double the occasion of services, and nearly tripled referral rates.**
  - **Had improved family-centred practice**
  - **Clinicians' perceived benefits: improved rapport and relationships, increased ability to provide comprehensive assessments and feedback secondary to frequency of visits.**
  - **Clinic coordinator and administrative officer roles identified as essential**

- **A new outreach model of care, informed by the literature review, community stakeholder feedback and the success of the interim model of care, will be implemented across THHS in 2016, and evaluated after 6 months.**

- **Evaluation of the new model of care will be both quantitative and qualitative and will consider:**
  - **Impact on community engagement (measured by referral rate)**
  - **Impact on community awareness of developmental impairment (measured by analysis of age of children at the time of referral)**
  - **Impact on family engagement (measured by attendance rate)**
  - **Consumer and community satisfaction**
  - **Cross sector and agency partnerships**

2.   The Evidence for a New Model

Rationale and Background

Introduction

Queensland Health is committed to improving the health and wellbeing of those who live in rural and remote Queensland. However the challenge of providing equitable and accessible health services is complicated and magnified by large geographical distance and the need to address unique community characteristics (State of Queensland, 2014). To serve rural and remote areas, innovative models of care must be approached cooperatively, with community consultation and partnerships among healthcare service providers.

Multiple Queensland Health frameworks and guidelines govern the establishment of flexible, yet sustainable models of care to extend and improve current services. Themes of a desirable model of care include: health services focusing on patients and people, community empowerment, improving health equity and accessibility for all Queenslanders and investing, innovating and planning for the future (State of Queensland, 2014; State of Queensland, 2013b; State of Queensland, 2013c).

Townsville Hospital and Health Service (THHS) is located in North Queensland and covers an area of approximately 148,210 square kilometres or 8.5% of the total area of Queensland. The area included within the THHS expands north to Cardwell, south to Home Hill, east to Palm Island and west to Richmond. THHS services a local population of over 240,000 people and has one of the highest Indigenous populations in Queensland. More than 7% of the THHS resident population is estimated to be of Aboriginal and Torres Strait Islander origin, which is double that of the 3.5% for Queensland as a whole. Additionally there is 11.3% of the population that identifies as being born overseas. The Townsville Hospital is one of the largest non-metropolitan hospitals in Australia and is the specialist tertiary referral hospital for Tropical North Queensland. There are 7 rural hospitals and 5 community clinics/ health centres across the region.

The Child Development Service (CDS) Townsville has been providing outreach to children with chronic and complex developmental concerns living in outer regional, rural and remote localities across the Hospital and Health Service since the 1990's. CDS Townsville currently outreaches to Ingham, Charters Towers, Hughenden and Richmond, with paediatric allied health services from The Townsville Hospital outreaching to Palm Island. A preliminary review of this outreach service indicates that the current service model is inefficient and ineffective, dislocated from local service providers, and is delivered in a way that is not evidence based or family focused. The increasing costs of service provision delivered in this manner put the longevity of services in these areas at risk.

Aligning service delivery with evidence-based practice is part of the Queensland Health Strategic Plan 2014-2018 (State of Queensland, 2015b), Townsville Hospital and Health Service Strategic Plan 2014-2018 (State of Queensland, 2015a) and Statewide Child and Youth Clinical Network's Child Development Subnetwork 'Child Development in Queensland Hospital and Health Services: Act now for a better tomorrow 2013-2020' document (State of Queensland, 2013b). The 'Child Development in Queensland Hospital and Health Services: Act now for a better tomorrow 2013-2020' document provides a framework for clinicians to better understand child development as a public health clinical service area (State of Queensland, 2013b).   This document also describes how child development interfaces across the care continuum, identifies core principles for practice for child development services and includes standards for clinical practice for a specialist child development stream of care (State of

Queensland, 2013b). These three documents were established to enhance organisational systems to support service delivery for equitable and accessible health care. CDS Townsville has used the frameworks within these documents to guide service improvement activities and to allow provision of equitable service delivery to children who live in Townsville. Service provision to children and families living across the broader HHS remains ad-hoc. To provide best care to the children and families within the greater THHS, CDS Townsville's outreach model of care requires remodelling to align more closely with the principles of practice and standards of care outlined in 'Child Development in Queensland Hospital and Health Services: Act now for a better tomorrow 2013-2020' document, THHS and Queensland Health Strategic Plans.

 In a climate of limited funding and finite resources, health care services have to demonstrate financial, societal and individual client outcomes. Outreach services have been established to enable access to specialist services that are provided close to home, foster collaboration between specialist and primary care providers and improve efficiency and health care service use (Gruen, Weeramanthri, Knight, & Bailie, 2004). Outreach takes many different forms, ranging from simple consulting services, to complex multifaceted interventions that include joint consultations, case-conferencing, education sessions, multi-disciplinary teams and other care enhancement (Gruen, Weeramanthri, Knight, & Bailie, 2004).

The objective of this literature review is to answer the question: *'What is the best practice for providing a contemporary child development outreach service to children and families living in regional, rural and remote communities in North Queensland?'*

Relationship between AEDC and SEIFA scores

There is increasing understanding of the prevalence of developmental impairment in early childhood, and of the impact this has on a child across their lifecourse. While developmental impairment can occur in any context, there is increased prevalence in certain populations, including children who are economically disadvantaged and children who live in rural and remote communities. Since 2009, the Australian Government has profiled the developmental capabilities of children from communities across Australia using the Australian Early Developmental Census (AEDC).

The AEDC is a national progress measure of early childhood development, collected every three years, at the time children commence their first year of full-time school. It measures five domains of early childhood development including:
1. Physical health and wellbeing,
2. Social competence,
3. Emotional maturity,
4. Language and cognitive skills (school-based) and
5. Communication skills and general knowledge.

These domains are closely linked to the predictors of good adult health, education and social outcomes (Australian Government, 2013; Commonwealth of Australia, 2016). The data captured by the AEDC enables services to better understand the developmental capabilities of children from communities across Australia and compare communities in terms of the prevalence of developmental vulnerability.

The AEDC data correlates with the Australian Bureau of Statistics (ABS) Census data to demonstrate the relationship between developmental vulnerability and socio-economic background. Each suburb or community within Australia is given an ordinal measure of a socio-economic indexes for areas (SEIFA) score. Accordingly, higher scores indicate relative advantage, and lower scores indicate relative disadvantage (Australian Bureau of Statistics, 2013). Based on this data, there is a direct link between lower socio-economic communities

and higher developmental vulnerability (Australian Government, 2013; Commonwealth of Australia, 2016).

Based on the AEDC data, *Table 1* (**below**) details the risk of developmental vulnerability for children living in Australia (average), Queensland (average), Townsville and in each outreach location included within the THHS. The targeted outreach sites demonstrate levels of developmental vulnerability significantly higher than the state and national averages, yet service access rates from these communities is low. Limited data secondary to small population numbers in remote and very remote communities can influence the AEDC results and should be interpreted with caution.

Table 1: Developmental vulnerability, SEIFA scores and % of Indigenous people in communities within THHS compared to state and national averages

Location	Developmental vulnerability in two or more domains			SEIFA score	Aboriginal and Torres Strait Islander People - Proportion of total population (%)
	2009	**2012**	**2015**		
Australia	11.8% (n=29,227)	10.8% (n= 29,543)	11.1 % (n= 31,754)	N/A	2.6%
Queensland	15.8% (n=8,307)	13.8% (n= 8,001)	14.0% (n= 8,713)	N/A	3.6%
Townsville Local Area				Range:	6.1%
Townsville	18.9% (n=215)	14.8% (n=185)	15.6% (n=204)	794 – 1130	
Thuringowa	16.7% (n=170)	17.2% (n=219)	16.8% (n=218)	938 – 1088	(Townsville Hospital and Health Service = 8.8%)
Burdekin Outreach (Burdekin)	18.3% (n=41	21.9% (n=49)	17% (n=39)	-	5.1%
Ayr	18.3% (n=20)	23.5% (n=27)	18.8% (n=25)	956	
Brandon	N/A	**	**	941	
Giru	**	**	0% (n=0)	905	
Home Hill	18.2% (n=8)	20.5% (n=8)	17.8% (n=8)	956	
South Burdekin	23.5% (n=8)	6.3% (n=6)	3.6% (n=1)	1026	
Charters Towers Outreach (Dalrymple)	23.0% (n=46)	17.5% (n= 33)	14.2% (n=29)	-	7.9%
Lissner	20.5% (n=9)	17.8% (n= 8)	19.6% (n=10)	908	
Millchester/Mosman Park	**	**	11.1% (n=2)	959	
Outer Charters Towers	21.4% (n=15)	17.2% (n=11)	9.1% (n=6)	975	
Queenton	24.2% (n=8)	17.4% (n=4)	21.9% (n=7)	893	
Richmond Hill	28.6% (n=12)	12.2% (n= 6)	10.8% (n=4)	978	
Hughenden/Richmond Outreach (Flinders)	0% (n=0)	13.6% (3)	9.5% (n=2)	-	
Hughenden	**	**	**	903	6.3%
Prairie	**	**	**	1032	
Richmond	-	**	5.9% (n=1)	976	5.8%
Ingham Outreach (Hinchinbrook)	23.6% (n=39)	11.7% (n=14) #	15.3% (n=24)	-	5.6%
Forest Beach	**	**	**	957	
Ingham	14.9% (n=10)	10.0% (n=4)	17.6% (n=9)	932	
North Hinchinbrook	12.5% (n=2)*	10.0% (n=2)*	12% (n=3) #	995	
South Hinchinbrook	14.3% (n=4)	0% (n=0)	0% (n=0)	1005	
Palm Island Outreach Palm Island	51.3% (n=20)#	23.1% (n=6)*	23.7% (n=9) #	582	94.2%

AEDC data collection is greater than or equal to 60% and less than 80% of the ABS five-year-old population; interpret with caution.   * AEDC data collection is less than 60% of the ABS five-year-old population. The AEDC may not accurately reflect the population of children; interpret with caution.   ** Too few teachers or children to display data.   (Australian Bureau of Statistics, 2013; Australian Government, 2013, Commonwealth of Australia, 2016)

Child development services to rural and remote communities in North Queensland

Contemporary and evidence informed practice principles in child development across Queensland

Statewide Child and Youth Clinical Network's Child Development Subnetwork 'Child Development in Queensland Hospital and Health Services: Act now for a better tomorrow 2013-2020' document provides a framework, a set of practice principles and standards for delivery of care for child development services across Queensland (State of Queensland, 2013b).

This document identifies the role of a specialist child development service as one that provides an individualised, integrated and targeted approach to understanding and supporting the needs of children with complex developmental concerns. This is achieved through:
- a comprehensive assessment process based on family driven questions about their child,
- multidisciplinary formulation of assessment results as well as provision of a feedback session (to explain assessment results and discuss an action plan),
- working in partnerships with the child, family and wider community to determine priorities and functional goals as part of intervention process,
- setting achievable and realistic goals and providing home programs or strategies, and
- empowering families to be the drivers in their child's future development.

Additional to the principles of practice and standards for delivery of care, it is important to understand that child development interfaces along a care continuum from universal public health (universal immunisation, developmental screening programs and mother-infant attachment) to targeted primary health care/generalist child development services to specialist/tertiary child development services (State of Queensland, 2013b). This interface must also be considered in the context of an outreach service.

Current CDS Townsville Outreach Model

The current CDS Townsville Outreach Service model lacks evidence of the recommended principles and standards for delivery of care, resulting in inefficient and ineffective service delivery for children living in communities in rural and remote North Queensland.

Currently CDS Townsville provides multidisciplinary occupational therapy and physiotherapy outreach services to Ingham (8 x 1 day visits/year), Charters Towers (4 x 1 day visits/year) and combined Hughenden/Richmond/Charters Towers communities (4 x 3 day visits/year) throughout the year. CDS does not offer speech pathology or social work services in outreach clinics. Taking into account the pre and post outreach administrative duties, the outreach service provided by CDS utilises 33 days of service from each discipline (occupational therapy and physiotherapy) over a 12 month period. Children are eligible for CDS outreach if they are aged between 0-6 years with complex developmental delays, or children aged 6-8 years who require multidisciplinary assessments for maximal participation in schooling.

Data sourced from a chart audit and HBCIS reports (**appendix 2**) indicated that the existing outreach service was not providing specialist child services in a well integrated family centred approach. Data also indicated that children reviewed by the outreach service were seen on average 1.5 times before discharge or transition to alternative service providers. This is significant less contact than what would be offered locally as a minimum standard. This reduced face to face contact, emphasises the need for goal oriented, time-limited service approaches to be considered in the development of the new model of service delivery. It also

highlights the importance of linking children and families with alternative local services and organisations that build participation within their respective communities.

CDS Townsville aims to develop an outreach service model for THHS rural and remote communities using the best national and international evidence. A review of peer reviewed and grey literature was required to guide this process.

Literature Review

Method

A literature search was conducted to identify specific models of care targeting child development service in rural and remote communities. The search included general databases; PubMed, CINAHL, MEDLINE and utilised Queensland Health Clinician Knowledge Network's (CKN) EBSCO host as the interface. The review was restricted to articles published in the last 15 years (2000-2015). In exploring the databases, multiple, alternative terms denoting child development services in rural and remote communities combined with Boolean operators (OR) for the title. The words included a range of synonyms and derivative terms signifying 'multidisciplinary', 'health care delivery', 'rural areas', 'child health services', 'Indigenous people' and 'telemedicine'. Then such separate searches were combined using 'AND' to export the yielding citations to EndNote X6, the reference manager software. Reference lists of the selected articles were also perused to locate further publications. Additional references were searched using either title search or author search in PubMed and Google Scholar to obtain related articles.

During the search phase of the literature review, it became apparent that the evidence for the research question "***What is the best practice for providing a contemporary child development outreach service to children and families living in regional, rural and remote communities in North Queensland?'*** emerged around four key themes.
These themes were:
1. Contemporary outreach service models for rural and remote communities;
2. Contemporary practice for children with developmental concerns and their families;
3. Best practice service delivery for Aboriginal and Torres Strait Islander people; and
4. Emerging use of Telehealth services

Contemporary outreach service models for rural and remote communities

The delivery of health care in rural and remote communities in Australia is a well known problem (Sheppard, 2005) and people who live in these small rural and remote communities face significant health disadvantage (Wakerman et al., 2008). In Queensland, over one-third of the state's population (approximately 1.8 million) lives in regional, rural or remote locations and has limited access to specialist health services (Australian Bureau of Statistics, 2015). The fact that specialist services are usually disproportionately concentrated in major urban centres results in access inequalities for rural populations (Gruen et al., 2004).

A growing body of evidence, research and knowledge has influenced different initiatives and policy change around rural and remote health (Sheppard, 2005). There is now a general agreement across governments for the need of specific policy response to rural and remote health issues. State and national frameworks, guidelines and policies have been established to guide the planning and provision of health care for rural and remote communities. *Table 2* (**appendix 1**) summarises the Australian frameworks.

These frameworks provide a roadmap to improve the equity and accessibility of high standard health care to all people living in rural and remote communities. The frameworks identify that new models of care must be approached cooperatively, with consultation, leading to outcomes that serve specific community needs, while encouraging partnerships amongst healthcare providers (State of Queensland, 2013a; State of Queensland, 2013c**;** State of Queensland, 2014). Because the vast geography of Queensland cannot be physically changed, it is imperative that when developing new models of care for health services for rural and remote communities, integration between policy level, organisation level and community level occurs (Bourke, Humphreys, Wakerman, & Taylor, 2012).

Different models of outreach service provision are discussed throughout the literature. Gruen et al., (2004) identified two primary healthcare outreach models of service delivery, the 'simple shifted outpatients' model, where outreach provides similar management to those provided by local clinicians, and the 'complex multifaceted model', where outreach involves increased networking between specialist and local primary service providers, education sessions, case-conferencing and joint consultation. Gruen et al., (2004) also reported that the simple model of service offers little benefit to service delivery and is limited to measures of patient satisfaction and convenience however, the complex model, conversely, was associated with improved health outcomes and more efficient and consistent care for clients. Although the above research was conducted in the context of a medical model of practice, Gruen et al., (2004) acknowledge that the multifaceted outreach model offers potential benefits to 'non-procedural specialties'.

One "complex" model of service delivery used to cover large geographical distances in rural and remote Australia, is the 'hub and spoke' model (Dew et al., 2012; Wakerman et al., 2008). Healthcare professional teams are located in a central service 'hub' and provide outreach services along 'spokes' to clients living in more remote locations, working collaboratively with local service providers (Battye & McTaggart, 2003; Dew et al., 2012). Another model of service delivery that has grown in evidence and use, over the past 2 decades is the Single Session Therapy model. It is a therapy model based on the theory that often clients will not continue to access a service (secondary to disengagement, loss to follow up, change in family circumstances) and therefore the first session with a client may also be the last (O'Neill, 2012; Young & Rycroft, 2012; Young, Weir, & Rycroft, 2012). It embodies the client-led, strength-based philosophy leading to truly collaborative and client-centred practice (Young & Rycroft, 2012). Though, historically, Single Session Therapy has been predominantly used within a mental health and counselling context, its broader applicability within a hospital and outreach setting should be considered (Young & Rycroft, 2012; Young, Weir, & Rycroft, 2012).

Humphreys, Wakerman & Wells (2006) defines sustainability, in the rural and remote context, as the ability of a health service to provide ongoing access to quality care in a cost-efficient and health-effective manner. In rural and remote communities, sustainability of a health service is challenged by small population sizes, difficulty recruiting and retaining a health workforce, the lack of clinical governance, geographical isolation, inconsistent visiting services, high proportion of Indigenous populations and relative socioeconomic disadvantage (Humphreys, Wakerman, & Wells, 2006).

The literature explores components for/impacting on successful and sustainable outreach models of care. *Table 3* (**appendix 1**) summarises a range of models of care from primary health/medical to multidisciplinary allied health models and differentiates these components.

Wilson, Seguin, Goodman, Greene & Pole (1999) explored referring rural health professionals' (either allied health or doctor) satisfaction with a mobile outreach model in Ontario, Canada. The outreach model provided assessment, consultation, education and limited treatment services in a transdisciplinary approach to rural communities in eastern and northern Ontario. Each patient/family/caregiver was given feedback regarding the results and recommendations following assessment. Implementation of the recommendations was a collaborative responsibility between the consultative outreach team and local health professionals based in the community. The results from this study identified that overall health professionals were largely satisfied with the outreach model. Interestingly, all allied health disciplines were found to be of "fairly" to "very" high importance by the majority of health professionals. However, where there was a complete *lack* of any comparable service in the community, specific disciplines and the outreach service overall was seen as *more* relevant. The interdisciplinary nature of the assessment was cited as the greatest asset of the outreach service and the most negative comment was that the outreach service did not visit the community frequently enough and therefore wait times for an appointment were lengthy. This particular study identifies a successful outreach model of care that promotes health professional satisfaction. Interdisciplinary assessments, family education, feedback and collaboration with existing services (as discussed by Wilson, Seguin, Goodman, Greene & Pole, 1999) can be applied to the Child Development Service Outreach Model.

In summary, though it is well documented that communities are unique and one size does not fit all, commonalities of a successful and sustainable outreach model of care can be identified. These include:
- Appropriate policy, governance, leadership and funding exist to support the service
- Community consultation and participation is undertaken when planning a new model
- Service provision is flexible and innovative to meet local needs
- Services are integrated and collaborate with existing service providers
- Services are regular and predictable in nature
- Services are multidisciplinary and transdisciplinary in approach
- Telehealth and emerging technologies are utilised to support service provision.

Outreach has been described as a low-cost, health care option that has been essential in ensuring equitable access to health care for people living in rural and remote communities (O'Sullivan et al., 2014). Planning specialist outreach services requires detailed knowledge of the targeted population, the gaps in existing resources and the potential contribution of a specialist outreach team (Gruen et al., 2004). Evaluation of an outreach services' ability to address inequalities in access to specialist care is necessary to expand the existing evidence base. Additionally cost-effectiveness and equity considerations will require thoughtful evaluation (Gruen et al., 2004).

Contemporary practice for children with developmental concerns and their families

There is extensive evidence that early intervention (0-8 years) is important for children with developmental delays. The World Health Organization (2012) defines 'early childhood intervention' as "support for young children who are at risk of a developmental delay, or have been identified as having a developmental delay or disability. Early childhood intervention comprises a range of services and supports to ensure and enhance children's personal development and resilience, strengthen family competencies, and promote the social inclusion of families and children." In Australia, the term 'early intervention' is used more frequently than 'early childhood intervention.'

In Child Development Services specifically, early intervention refers to the coordinated assessment, diagnosis and/or therapeutic support offered as soon as possible following identification of a developmental impairment (State of Queensland, 2013b). Intervention is multifaceted and includes partnership with key stakeholders (including families), advocacy to support the understanding of a child's abilities, challenges and needs, direct therapy services, and education (tailored to the needs of the individual, their family and their broader context). Intervention needs to be conceptualised broadly and may occur at various points along the care pathway, including entry (assessment), diagnosis, therapeutic support and transition (State of Queensland, 2013b).

Timely access to early intervention has been shown to improve participation in family and local community activities and to enhance quality of life for both the child and their carers (Dew et al., 2013). For those who live outside of the main population centres, accessing regular early intervention services may involve significant travel. The financial and personal cost of travel for services is often more than some families can afford (Dew et al., 2013). As a result, this may limit a child from accessing early intervention compared with peers living in metropolitan areas (Dew et al., 2012). Outreach services can minimise the disruption to families' lives and reduce health inequalities by improving access to specialist paediatric and early intervention services (Heath et al., 2012; Williams & Smith, 2004).

Access to services represents a universal challenge for delivering care to children and families in their local community (Children's Hospitals Australasia, 2010; United Nations, 1989). Services are often delivered in an uncoordinated way – driven by professional/organisational imperatives rather than family need (Garbers, Tunstill, Allnock, & Akhurst, 2006). One of the highly publicised early intervention programs for children (under 4 years) is the Sure Start Local Programme, rolled out in the UK in 1998. Garbers et al., (2006) identified that the Sure Start program provided a "test bed" for developing new and innovative strategies around enhancement and facilitation of access to services. Findings from this paper recommended that outreach services for children need to be based on widespread community consultation and that a range and mix of services appropriate to each community was required (Garbers et al., 2006). While diversity for each individual community was encouraged, key principles were recognised which are similar to those identified by Jayaratne, Kelaher & Dunt (2010). These principles support a model that works with parents and children, is accessible for everyone, is flexible at the point of delivery, promotes early intervention, is respectful and transparent, yet still professionally coordinated and outcome driven (Garbers et al., 2006; Jayaratne, et al., 2010).

Optimising a child's participation and function rather than focussing on finding a "fix" for developmental delay is a philosophy that underpins the frameworks of practice for specialist child development services within Queensland. Traditional models of care are not well applied to complex developmental contexts and the approach to working with this population aligns more appropriately with a chronic disease model (State of Queensland, 2013b). As one

part of the life course, early childhood is considered as the most important developmental phase (State of Queensland, 2013b) and engaging the community to facilitate opportunities for a child's participation in productive and complementary interactions across multiple environmental settings sets a critical foundation for future school success, employment, economic participation and health and wellbeing (State of Queensland, 2013b).

State of Queensland (2013b) identifies that a child development service should provide family-centred, community-based transdisciplinary care for children with complex developmental delays. Family centred care recognises families' expertise concerning their child's needs. Family-centred approach is based on an enablement model that promotes self-determination, decision making and self-efficacy, through a focus on strengths and collaborative partnerships (King, Curran, & McPherson, 2013). An outreach or rural and remote model can replicate these principles if applied in a collaborative way, enabling partnerships between service providers and communities (King et al., 2013). In keeping with family-centred principles, it is also important to note that optimal functioning occurs for children and families within a supportive community context (King et al., 2013). Communities are unique and different, and community members know their own needs and situations best (Allan, Ball, & Alston, 2007). Community consultation is therefore the foundation on which health service provision must be configured (Allan et al., 2007; Battye & McTaggart, 2003; Birks et al., 2010). The findings of a needs analysis are vital for service planning to identify gaps and barriers and provide a platform for community collaboration (Allan et al., 2007). A sustainable model of care needs to be collaborative and acknowledge and support the ownership, power and expertise of community members (Battye & McTaggart, 2003; King et al., 2013).

The development of strategic partnerships between service providers and the community is central to developing innovative mechanisms to improve the quality of outcomes in child health (Jayaratne, Kelaher, & Dunt, 2010). Outreach services that are developed and delivered in partnership with primary care were perceived as advantageous for children and young people, as they had potential to provide enhanced continuity between health, education and social elements (Heath et al., 2012). Improved communication between service providers enhances the patient experience and provides better access to services (Heath et al., 2012).

Jayaratne et al., (2010) explored the relationship between child health partnerships and overall outcomes, finding that intervention programs that fostered cross-agency linkages or partnerships between stakeholders led to the formation of a 'holistic' service model catering for families. Access and service utilisation by consumers typically improved and more families, including those that were most disadvantaged, were better engaged (Jayaratne et al., 2010). Though cross-agency collaboration was recommended, there was no specific program model identified, as the model itself differed dependent on the needs of the local community (Jayaratne et al., 2010). Furthermore, Jayaratne et al., (2010) recommended the increased use of outreach home visits, particularly for children from families that are most disadvantaged, be considered to further alleviate access barriers. Long established services were also linked to improved child outcomes (Jayaratne et al., 2010) which further supports the need for sustainability of a service/model of care.

Child development occurs not only in the home, but across the broader community setting (State of Queensland, 2013b), therefore a model of care that considers the local community context and collaborates with key stakeholders enhances overall service provision (Jayaratne et al., 2010). Joint case management and planning, involving both the local health team and the outreach specialist team creates an increased efficiency of care (Williams & Smith, 2004). Community participation when developing a new model of care or driving change of service enables the community to feel empowered and valuable (Jeffery & Ervin, 2011).

Rural communities differ widely in their capacity to work collaboratively; therefore, there is a clear need to nurture the skills and knowledge of local community leaders. Local leaders may

be drawn from schools, primary health care providers, other government and non-government organisations and are likely to have existing trust and credibility at an organisational level as well as at community level (Johns, 2010). Utilising local leaders to encourage rural communities to take greater ownership of their health and wellbeing enhances community empowerment, thus supporting families and promoting child development (Johns, 2010).

In summary, early intervention services are those that are tailored to meet the individual needs of the child and focused on supporting the child in their natural environments, in their everyday experiences and activities. The overall aim of these services is to provide parents and families with the knowledge, skills and support to meet the needs of their child and to optimise the child's development and ability to participate in family and community life. Key components of contemporary practice for children with developmental concerns and their families include:

- A focus on early intervention services
- Family-centred care (families are the experts of the child and drive the child's journey),
- Community-based and transdisciplinary practices,
- Partnerships with key stakeholders (including families) and cross-agency collaboration to enhance maximal community participation

Outreach models that nurture and support communities and existing services to provide access to early intervention services are important for children with developmental delays living in rural and remote communities.

Best practice service delivery for Aboriginal and Torres Strait Islander peoples

Aboriginal and Torres Strait Islander children in Australia experience a higher prevalence of disability and socio-economic disadvantage than other Australian children (Biddle, Yap, & Gray, 2013). Indigenous children are 1.3 times as likely to require assistance with self-care, mobility and communication when compared to non-Indigenous children (Pink & Allbon, 2008) and have increased risk for developmental delay (McDonald, Comino, Knight, & Webster, 2012). Availability and accessibility of a range of mainstream health services are inequitable between Indigenous, Non-English speaking backgrounds, and English-speaking background children (Ou, Chen, Garrett, & Hillman, 2011). Barriers to access are reported as long wait times, infrequent services, lack of services in the local area and costs involved in travelling to another centre (Ou et al., 2011).

Outreach health services can address some of the barriers to access and inequitable service provision to Indigenous children and families (Gruen, Weeramanthri & Bailie, 2002). Gruen, Weeramanthri and Bailie (2002) examined the role of specialist outreach services in overcoming the barriers to accessing health care faced by the Indigenous populations in remote areas of Australia, and examined issues affecting outreach models sustainability. The benefits of outreach included a reduced need for families to travel away from their community, decreasing the disruption to families and the cost involved in accessing the service. Outreach services also enabled extended family and caregivers to be present in the consultation with the health professional resulting in improved communication (Gruen, et al., 2006).

The Australian Government's *"Closing the Gap"* campaign (Council of Australian Governments, 2008), Queensland Government's *National Strategic Framework for Aboriginal and Torres Strait Islander Health* (2007) and the *Palm Island Health Action Plan* (2011) are built on principles and practices including collaboration, cross sector partnership and community engagement. These principles aim to improve Indigenous children's access to health services and complement those principles of contemporary child development service provision.

Table 4 (**appendix 1**) summarises the evidence that supports best practice service delivery for Indigenous Australians. The literature explores the principles of collaboration, cross sector partnerships, community engagement, cultural context, cultural awareness and sensitivity and communication.

In summary, developing sustainable and culturally safe outreach models of care for Indigenous populations relies heavily on building positive relationships with both families and community and collaborating with other services and agencies. Additionally, using appropriate language and communication, and understanding child development within the cultural context is essential.

Emerging use of Telehealth services

Telehealth has become an increasingly viable solution to address the resource limitations, workforce shortages and geographical barriers that impact service delivery in rural areas (Hooshmand, 2010; Marcin et al., 2004). It supports provision of speciality consultation for children in their own community, whilst facilitating care that is more accessible, family centred and coordinated with local service providers (Hooshmand, 2010; Marcin et al., 2004; Moffatt & Eley, 2010). In Australia, distances between regional towns can be considerable, and telehealth is an alternative method of delivering services to people living in rural and remote areas (Smith, 2007).

Specialist health services are provided to people living in rural and remote Queensland via patient travel (patient receives a subsidy to travel to regional/metropolitan centre), outreach clinics (specialist travels to rural/remote area to provide service) or telehealth (Croll, Norton, Gray, Bryett, & Smith, 2012). Croll, et, al., (2012) identified that patient travel is the conventional method for accessing specialist services in Queensland and that the costs in supporting this model are approximately $54 million per annum. Specialist outreach clinics are the preferred method to provide ongoing health services to children and families in rural and remote areas (Heath et al., 2012; Williams & Smith, 2004). These outreach clinics can be supported and complemented by telehealth services ,where telehealth is used in either real time or by pre-recorded means (Croll et al., 2012). Telehealth reduces the travel and work-loss burden for families (Marcin et al., 2004; Moffatt & Eley, 2010). Furthermore, Smith, Caffery, Saunders, Bradford, & Gray, (2014) identified that implementing new telehealth services in partnerships with the community and existing health service providers improves clinicians' awareness and acceptance of telehealth, increases telehealth activity in the local region and improves access to services for families (Smith et al., 2014).

Smith et al., (2007) performed a cost analysis of Queensland children accessing Child and Youth Mental Health Service (CYMHS). They compared the costs of patient travel (children and families travelling to Brisbane for services), visiting outreach clinics and telehealth services. Telehealth was reported as the lowest cost service delivery option, and patient travel was the most expensive (Smith et al., 2007). CYMHS and CDS share similarities in service structure (community based, family centred, multidisciplinary) and thus, it is hypothesised that the results of this study would be comparable to a Child Development Outreach Service model.

The Shepherd Centre, a non-profit early intervention (0-6 years) program in New South Wales, provides interdisciplinary speech and language services to children with hearing loss and their families. Additionally, the Shepherd Centre also provides outreach services to families in rural and remote areas in Australia and in other countries. A program profile was completed to identify the benefits and barriers of their recently implemented telepractice model using Skype (Davis, Hopkins, & Abrahams, 2012).
The following were identified as benefits of the program:
- Accessible by all families
- Ability to model and guide sessions around functional activities while observing the child in their home.
- Families/caregivers, child care facilities, school teachers and local health professionals were able to participate in Skype sessions to achieve family's goals.
- Consultative relationship between Shepherd Centre (specialist team) and the local service providers enabled necessary follow up for families.
- Families reported benefits including: increased empowerment and confidence, new "therapy" ideas, up-to-date information, working with local providers and being in their own home.

- Professionals reported benefits including the use of family's own resources, working within the home environment and routines, empowering parents as therapists and increased opportunity for parent education.

Challenges identified as part of the telehealth program included:
- Telehealth does not and cannot take the place of face to face contact with families.
- Telehealth requires good communication between professionals and families.
- Telehealth relies heavily on the success of technology and equipment.
- Telehealth presents its own challenges with engaging children through the screen.

Telehealth should not completely replace traditional clinician-patient relationships, but it has been found to be a successful complement to a visiting outreach team (Gruen et al., 2006) or an early intervention program (Davis et al., 2012).

Increased use of telehealth is one of the priorities identified in the *Better Health for the Bush* (2014) to support rural and remote consumers' access to allied health services. The *Allied Health Telehealth Capacity Building Scoping Project* (State of Queensland, 2015a) identified workplace capacity, service redesign, and infrastructure/access resources, tools and training programs already available and those required to support telehealth implementation in allied health services within Queensland Hospital and Health Services. It also identified future research gaps with respect to telehealth. The project identified that telehealth services could improve timeliness and frequency of services, and reduce travel for clients and/or clinicians to access/provide services. Two major models were described in the project; the dual clinician model (clinical staff support service delivery at both hub and recipient site at which the client is present); and direct client care model (clinical staff are present at the hub site and connect directly to the client). The project acknowledged that formal service development planning was generally limited, and clinicians had limited access to examples or guidance with respect to telehealth implementation in their profession and practice area. Engagement, shared understanding and expectations of responsibilities, and strong partnerships between hub and recipient site staff / services were identified as critical factors for telehealth development, implementation and sustainability. Hub- recipient site partnerships were identified by project informants as the most significant challenge and potential impediment for the development of allied health telehealth services. The project established that additional allied health professional training, service and clinical redesign tools, as well as improved networking and dissemination strategies for information on successful models would best facilitate the expansion of telehealth services in Queensland Hospital and Health Services.

Telehealth may provide an educational benefit to rural service providers, reduce provider isolation and potentially increase local health professionals' knowledge in a paediatric specialty (Marcin et al., 2004; Moffatt & Eley, 2010). Additionally telehealth can be used to contact parents and families before and after clinic visits. It is a means to provide a service that supports child development standards for delivery of care such as orientation, assessment feedback, program and goal reviews (State of Queensland, 2013b). Historically, geographical distance and infrequent visiting clinics have limited the ability to provide this feedback and education in a timely manner, telehealth is beneficial is bridging this gap (Hooshmand, 2010; Marcin et al., 2004; Moffatt & Eley, 2010). Providing patient education or feedback soon after a specialist assessment improves both quality of life and clinical outcomes in paediatric populations (Hooshmand, 2010; A. C. Smith, Batch, Lang, & Wootton, 2003). It can therefore be postulated that the provision of parent education and feedback via telehealth to geographically-isolated families immediately after an initial assessment with a specialising child development team is very important.

Recommendations for an Evidence Based Model of Care

Findings from this literature review "***What is the best practice for providing a contemporary child development outreach service to children and families living in regional, rural and remote communities in North Queensland?'*** (exploring outreach models in combination with child development, Indigenous communities and advancing technology) recommend flexible and innovative outreach models that build on existing options, are tailored to local needs, and promote cross-agency collaboration increase access to family-centred therapy services for children and families living in rural and remote areas.

The 'complex' model of outreach service delivery is recommended as the model of best practice from the available evidence. This model focuses on increased networking and collaboration between the visiting specialist team and rural primary service providers and places strong emphasis on the utilisation and mobilisation of existing resources within rural communities. Within this model the CDS outreach team act as consultants, educators and indirect service providers rather than the direct providers of care. Consideration also needs to be given to the Single Session Therapy model, particularly in an outreach setting where children may only be reviewed a limited number of times.

Knowing that child development is multifaceted, when developing a new model of care, recommendations are not only guided by the literature but by a thorough understanding of the core business of a child development service. The overall aim of an outreach service is to improve access for families living in rural and remote communities, whilst providing parents and families with the knowledge, skills and support they need to meet the needs of their child and to optimise the child's development and ability to participate in family and community life. Outreach models that nurture and support communities to provide increased access to early intervention services that support the child in their natural environment are essential.

Evidence informed child development outreach services will:
- Be supported by appropriate policy, governance, leadership and funding,
- Have community consultation and participation,
- Provide a service that is flexible and innovative to meet local needs,
- Partner with key stakeholders (including families) and be integrated and collaborative with existing service providers,
- Be regular and predictable in nature,
- Be multidisciplinary in approach,
- Provide early intervention services that are guided by family-centred and transdisciplinary care practices
- Provide timely provision of feedback and education,
- Utilise telehealth and technology to support the service when not physically in town, and
- Be culturally safe, use appropriate language and communication for Indigenous families, and understand child development within the cultural context.

CDS Townsville is in the process of establishing an outreach model of care that incorporates the above findings and recommendations as well as determining the specific needs of the communities. Considerable changes and co-operation between Child Development Service Townsville, Townville Hospital and Health Service rural clinicians, Townsville Hospital and Health Service paediatricians and respective Service Group Management is required to support the new model of outreach service delivery. Ongoing evaluation and remodelling of the new model of care will continue into the future.

3.   Identifying Consumer Needs

The evidence recommends that partnering and consulting with key stakeholders (including families) and communities is essential when developing a new model of care. This allows the model to be flexible, innovative and integrated with existing services in order to meet local needs.

Feedback was collected caregivers, local clinicians and local community stakeholders who lived in the rural and remote communities within the Townsville Hospital and Health Service in order to better understand their specific needs with respect to child development. In addition, service mapping was undertaken with key community stakeholders to identify existing services and current gaps.

Caregivers' Analysis of Needs

28 families who had accessed CDS Outreach Service between 1 July 2014 and 30 June 2015 were identified. An additional 9 families had accessed the service however these families were not included in the survey as the children were identified as not eligible for CDS and were requiring transition/discharge to another service.

The 28 families were contacted by phone to request consent to participate in the survey and to provide an email address for the survey to be sent. 22 (78.6%) of these 28 consented and a survey exploring experiences with CDS as well as perceived needs of the services was forwarded (via Survey Monkey). 10 (45.5%) of the 22 caregivers responded to the survey.

Key findings from caregiver feedback include:
- 100% (n=10) of respondents were the caregivers of pre-prep or school aged children (no 0-3 year age group).
- Caregivers commented that feedback, communication with the child's school and the investigation of concerns and provision of an action plan were positive aspects of a CDS outreach service.
- Caregivers commented that the lack of regular therapy and limited access to allied health disciplines impacted on how well the CDS outreach service met their family's needs.
- Parent education in understanding their child's needs and early screening (readiness for prep) were identified by caregivers as the most important service CDS can provide. Increased frequency of visits, assistance with transitioning child into school, home programs and communication and with day care / kindergarten / school were also highlighted as important needs.
- Clinic co-ordination, case management and increased speech pathology, occupational therapy and child psychology/social work services were also discussed by caregivers as key areas CDS could improve. Caregivers also noted that a paediatrician would add value to the CDS Outreach service.
- 50% (n = 5) reported Queensland Health facility is most appropriate location for CDS appointment. 20% (n = 2) reported home visits would be most appropriate. Demographics were reviewed for those who selected 'home visit.' Both identified as single parents, both had a reported annual income of 0-$24,999, 1 identified as Aboriginal and both were from more remote postcodes.
- 40% (n=4) reported interest in using telehealth for review sessions with CDS, 10% (n=1) not interested and 20% (n=2) unsure about the use of telehealth.
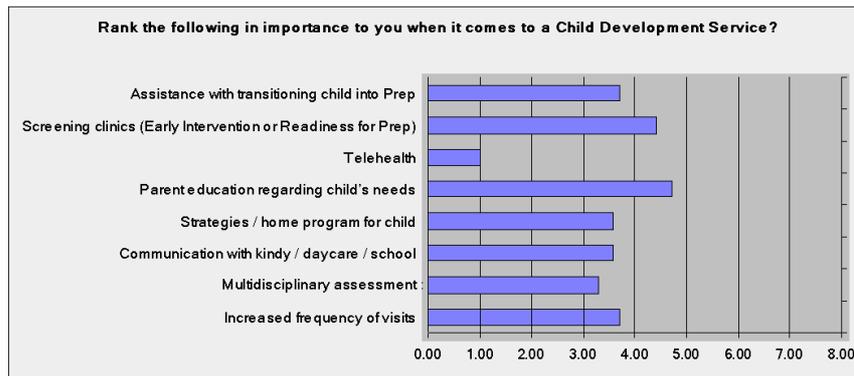
Rural Clinicians' Analysis of Needs

A survey investigating the capacity for and perception of paediatric allied health services was forwarded (via Survey Monkey) to the 13 Queensland Health allied health clinicians working in the rural and remote communities within the THHS. There was a response rate of 61.5% with eight of the 13 clinicians responding to the survey.

Key findings from THHS rural and remote allied health clinicians' feedback include:
- 75% (n=6) of clinicians identified that paediatric health services are an area of unmet need in their community.
- 100% (n=8) and 75% (n=6) of clinicians, respectively, identified that Child Psychology and Social Work services were rated as the most lacking and needed in rural and remote THHS.
- 62.5% (n=5) of clinicians identified that Paediatric Occupational Therapy, Physiotherapy and Speech Pathology Services were identified as equally lacking and needed in rural and remote THHS.
- 87.5% (n=7) of clinicians surveyed said that support from a specialist child development service was 'very important' or 'absolutely essential' in assisting them to manage a paediatric caseload in their community.
- 100% (n=8) of respondents identified that support would be most useful in the form of integrated transdisciplinary assessments of complex children.
- 87.5% (n=7) of respondents identified that shared care model (i.e. joint sessions) as well as education and in-services from Child Development Service would be most useful in assisting them to manage a paediatric caseload in their community.
- Screening clinics of 4 to 5 years olds in kindergarten to identify difficulties prior to transitioning to education system was identified as a beneficial addition to an outreach service.
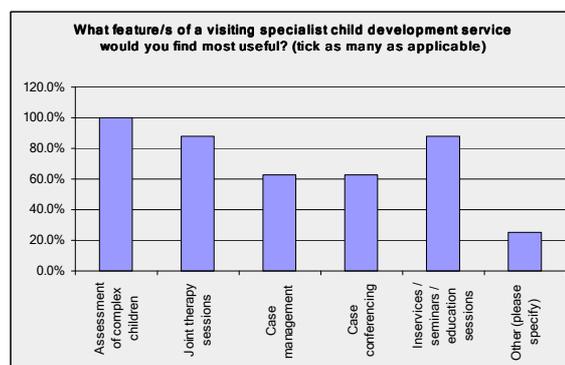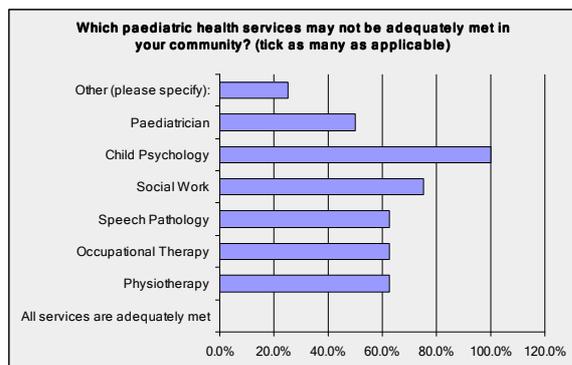
Additional comments:

- *"The school aged population would significantly benefit from increased services in all areas of allied health intervention. Speech pathology intervention is particularly lacking for all children of school age as there are currently no publicly funded services that are readily able to provide an individual assessment of need for students. Given that this is a low socio-economic area, parents are not often able to afford private speech therapy or any therapy of any kind."*
- *"Speech pathology is well covered in the 0 - Prep age group but services are lacking for school-aged children. There is a gap for paediatric OT, physio, SW and psychology - even though an assessment can be completed, follow-up therapy is often difficult due to long gaps between outreach visits. A more regular service where therapy programs could be offered would be of immense benefit to our paediatric clients."*
- *"Children are falling through the cracks because there is no visiting paediatrician service here. Transport is an issue for many families. They are not getting a diagnosis and therefore not accessing support (i.e. ECDP or HCWA). The children with multiple needs would benefit greatly from having a multidisciplinary approach including outreach speech pathology and social work."*

Community Stakeholders' Analysis of Needs

A survey was sent to 83 community stakeholders including; primary school principals/teachers, early childhood centre/kindergarten directors, Queensland Health child health nurses, Queensland Health allied health professionals, NGO and other community groups. There was a 33.7% (n=28) response rate to the surveys.

- As a collective group, allied health professionals had the highest response rate overall, however Child Health Nurses had the highest intra-profession response rate.

Cohort	No. of surveys sent (n)	Survey response rate *(within cohort)* %(n)	Response rate overall % (n)
Child Health Nurse	5	80% (n=4)	14.3% (n=4)
Health Professional (allied health)	16	56.2% (n=9)	32.1% (n=9)
School Principal / Teacher	37	22% (n=8)	28.6% (n=8)
Early Childhood / Kindergarten Director	20	25% (n=5)	17.9% (n=5)
Other Community Stakeholder	5	40% (n=2)	7.1% (n=2)
Total	**n=83**	**33.7% (n=28)**	**100% (n=28)**

- The surveys captured stakeholder opinions across 6 rural communities within the THHS including Burdekin, Charters Towers, Hughenden, Ingham, Palm Island and Richmond.

| Community and (postcode)	No. of surveys sent (n)	Survey response rate *(within community)* %(n)	Response rate overall % (n)
Burdekin (4806/4807) (Ayr/Home Hill)	17	47.1% (n=8)	28.6% (n=8)
Charters Towers (4820)	16	43.8% (n=7)	25% (n=7)
Hughenden (4821)	4	50% (n=2)	7.1% (n=2)
Ingham (4850)	26	15.4% (n=4)	14.3% (n=4)
Palm Island (4816)	14	28.6% (n=4)	14.3% (n=4)
Richmond (4822)	6	50% (n=3)	10.7% (n=3)
Total	**n=83**	**n=28**	**100% (n=28)**

- Over 20% of the community reported CDS had met their expectations with close to 50% (46.4%) having no previous experience with CDS.

Has your experience with Child Development Service (CDS) in the past, met your expectations?		
Answer Options	Response Count	Response rate overall
I have had no previous experience with Child Development Service	13	46.4%
Yes, it has met my expectations	6	21.4%
No, it hasn't met my expectations	4	14.3%
Unsure	4	14.3%
Unanswered	1	3.6%
Total	28	

- Parent education regarding their child's needs was identified by community stakeholders as the most important service CDS can provide. Communication with early education facilities (day care / kindergarten / school), screening clinics (for early intervention or readiness for prep), increased frequency of visits and multidisciplinary assessments were also highlighted as important needs
- Access to child psychology/social worker to support children's emotional wellbeing, providing parenting education/skills sessions, consulting and liaising with existing services including the education department, access to a visiting paediatrician (Ingham specifically) where there currently isn't one and improved access to allied health support were also discussed by community stakeholders as key areas CDS could add value to a community.
- 42.9% (n = 12) reported Queensland Health facility is most appropriate location for CDS appointment. 14.3% (n = 4) reported that home or day care/kindergarten visits equally would be most appropriate.
  Comments:
  - "Where parents feel comfortable; in a neutral place - not home or a department facility or wherever the best facilities are, i.e. waiting area, enough space for the clinicians, etc"
  - "Wherever the family wants it to be. Make it their choice"
  - "Varies - family orientated so what works best for the clients"
  - "Home visit would be the optimal site to see the family environment"
- Almost 65% (n=18) reported interest in using telehealth for review sessions with CDS, with 7% (n=2) both not interested and unsure.
- The community stakeholders had an opportunity to provide general comments about a child development service in their specific community. Two key themes emerged from this feedback. They were; identifying the importance of co-ordination, communication and collaboration with existing services (including the Education sector) and that cultural sensitivity, rapport and coordination is paramount when providing a service to a remote Indigenous community.
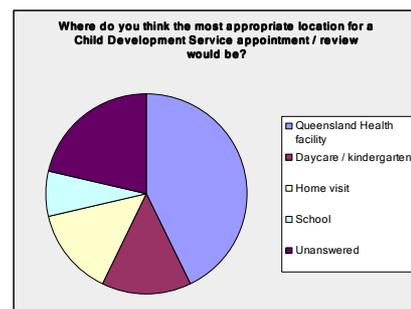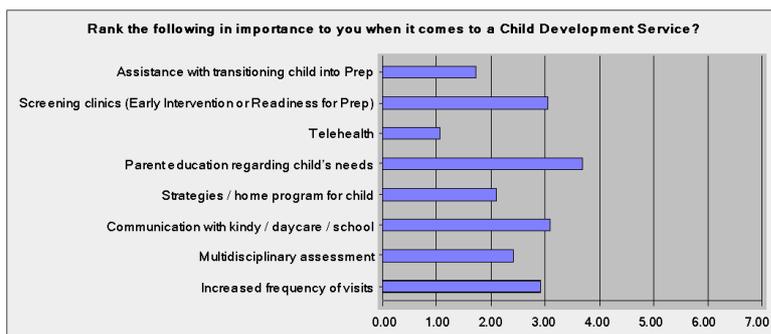
Service Mapping of Paediatric Services Located in Outreach Communities

Community stakeholders were asked to provide feedback about the existing paediatric services in each individual community. This feedback was undertaken with a face-to-face meeting in each location and was attended largely by the local allied health professionals and child health nurses in each area. Any additional community stakeholders that the health professionals identified were also invited to attend. These included early childhood centre directors, primary school principles, members from NGOs and advocacy groups.

Key findings from service mapping sessions with rural and remote community stakeholders highlight:
- Limited access to allied health support services (with particular reference to speech pathology) for school aged children.
- The need for a dedicated outreach clinic co-ordinator to maintain networks and communication with rural and remote providers. Without this resource services have become fractured and poorly co-ordinated.
- The roll-out of Parental Evaluation of Development Status and Ages and Stages Questionnaire within the Personal Health Record for babies born from January 2016 may increase referral numbers to Child Development Outreach Service.
- The early roll-out of the National Disability Insurance Scheme in Charters Towers and Palm Island may increase the number of referrals to Child Development Outreach Service.

Additionally, service mapping of Palm Island was undertaken with The Townsville Hospital (TTH) acute paediatric allied health team who provide child development outreach services to this community. Understanding the current service delivery model was essential in the development of an enhanced model.

The TTH clinicians reported the service currently comprises of:
- 4 x 1 day trips per year with a physiotherapist, speech pathologist, occupational therapist, dietician and an Indigenous Liaison Officer.
- The dietician reviews most children in attendance (failure to thrive / obesity / iron deficiency and other community based dietary based reviews) however if acute dietetic input is required, the child is seen at TTH.
- 16-20 children seen per clinic.
- No set appointment times. Families are seen upon arrival in a staggered review process.
- Children are eligible from birth til school entry.
- Caseload has a primary developmental focus.
- The current service has no dedicated funding.

Additional key learning's from the acute allied health team include:
- Services provided by THHS need to be culturally sensitive
- Consistent workforce is important for building rapport and trust between families and clinicians.
- The service should be flexible and responsive (i.e. to drop in appointments).
- The service should support clinicians to work in a transdisciplinary model – to enhance timely access and improved engagement with families in the clinical setting.
- A model of care that is suitable to Townsville or other THHS communities is not likely to be suitable for Palm Island.
- Utilising Indigenous Liaison Officer support improves engagement with families.

Overall Analysis of Consumer Needs and Service Mapping

The key findings from the consumer analysis of needs and service mapping activity aligned with the findings of the literature review.

When comparing the feedback from caregivers, rural clinicians and community stakeholders there were several emerging key themes. All consumers identified that there is limited access to health disciplines in their communities. Both the caregiver and community stakeholder groups identified that school-aged children, in particular, had most limited access to allied health assessment and services. Consumers identified that child psychology and social work, to support children's and families' emotional wellbeing, were the *most* lacking and needed in rural and remote THHS. This finding supports the literature in that where there is an absolute absence of a particular discipline/service; the community perceives this service as being the most important/lacking. In the rural and remote communities of THHS, there is an absolute absence of child psychology and social work supports specific for paediatric developmental caseloads. It was also identified that access to speech pathology, occupational therapy, physiotherapy and paediatric services were equally lacking and needed in these communities and that an increase in these services would benefit children and families.

Caregivers and community stakeholders both agreed that assisting parents to better understand their child's needs was the *most* important aspect of a child development service. A service that visits more frequently and builds on relationships with existing services (including early education facilities) was also highlighted as important. Similarly, rural clinicians and community stakeholders identified screening clinics (for early intervention or readiness for school), integrated multidisciplinary/transdisciplinary assessments of complex children and ongoing education as beneficial contributions of a child development service in their community. All consumer groups identified the importance of co-ordination, communication and collaboration with existing services within the community.

Cultural sensitivity was identified as an integral component of a service, with collaboration and guidance from the community being identified as the best way to build rapport. Caregivers and community stakeholders both identified that a Queensland Health facility is the most appropriate location for child development service clinics, however, home visits and other culturally appropriate locations/facilities should be considered to provide equity of access to services to those families that are most disadvantaged.

These findings are consistent with the findings from the literature, and form the recommendations for the improved model of care.

4.   The Pilot Site

Charters Towers: A 3 Month Interim Model of Care

CDS Townsville identified Charters Towers as the pilot site to trial an interim model of care, based on early findings from the literature review and consumer feedback. Due to the reduced time frame available to trial the interim model, it was essential to select a site where existing relationships were already established. Charters Towers also provides a platform for objective comparison with the existing CDS Outreach model.

Charters Towers is a small rural town located 134 km south-west of Townsville, with a population of approximately 8200 people. The Australian Early Development Census identifies that 30.2% and 17.5% of children entering school in Charters Towers as having high developmental vulnerability in one or more, and two or more domains, respectively

Previous services provided to Charters Towers by CDS Townsville outreach service involved:
- Visits twice a school term (approximately every 8 weeks) by a physiotherapist and occupational therapist only
- Working mostly in professional silo
- First point of contact with Child Development Service was often not family centred; in that orientation to the service not provided, parent's questions not driving the assessment process and feedback about the assessment results was rarely provided.

The interim model of care was:
- Over a three month period from August to October 2015.
- Visits every 4 weeks with an occupational therapist, physiotherapist and an additional speech pathologist from CDS.
- Increased consultation, collaboration and integration with local services
- Based on feedback of community needs
- Provided in a family-centred, transdisciplinary way

The table below compares the existing model (3 month average from 2014) to the 3 month trial period of the interim model (Aug-Oct 2015)

Table 7: HBCIS data comparing referral rates and OOS with existing model and 3 month interim model of care

	Existing Model (1Jul 2014 – 30 Jun 2015)		3 month Interim Model (1 Aug 2015 – 31 Oct 2015)
	12 month raw data	3 month average	
Referral Rates	19	4.75	13
Average age at Referral	3.4 years	-	3.7 years
Occasion of Service (OOS)			
Overall	51	12.75	22
Seen	40	10	17
FTA	3	0.75	0
Cancellation	8	2	5
Total OOS	**40**	**10**	**17**
Discipline Specific Interventions			
PT interventions - new	16	4	7
PT interventions - review	20	5	7
PT interventions - total	**36**	**9**	**14**
OT interventions - new	13	3.25	7
OT interventions - review	19	4.75	5
OT interventions - total	**32**	**8**	**12**
SP interventions - new	-	-	8
SP interventions - review	-	-	1
SP interventions - total	**0**	**0**	**9**
PT, OT, SP Totals	**68**	**17**	**35**

Definitions:
"OOS" = Occasion of Service as described by HBCIS booking system
"PT" = Physiotherapy
"OT" = Occupational Therapy
"SP" = Speech Pathology

Findings:

HBCIS Data suggests that:
- An increased presence and increased allied health services including the addition of a speech pathologist lead to double the clinical activity (occasions of service).
- Increased visibility of CDS clinicians resulted in almost triple the number of referrals received compared to referrals previously received in a similar period of time.

In addition to the 3 outreach visits conducted in the August-October 2015 period, Charters Towers clinicians and consumers identified that a screening clinic for the children at Kutjala Playgroup and Kindergarten would be a valuable addition to the model, allowing for the most vulnerable children to be identified prior to entering the education system. A screening clinic will be further explored and planned for 2016.

From July 2015 to October 2015, 13 children were referred to the Charters Towers outreach service. Of these 13, 8 children required multidisciplinary assessments, and 2 were referred for physio only gait clinic (the remaining 3 children were assessed outside of the 3 month trial period). A chart audit was undertaken of the 8 children who were seen for initial assessments by the CDS Outreach service in Charters Towers during clinics in August, September or October 2015.

The criteria used for the audit remained unchanged (from the audit performed from July 2014 – June 2015) so that comparisons could be made with the existing model.
The following criteria were used:
- Was the child eligible for CDS?
- Where was the child reviewed?
- Was there consistent parental attendance and engagement at reviews?
- Were the family orientated to CDS?

Child development services to rural and remote communities in North Queensland

- Were parent's developmental questions used to guide assessment process?
- Was feedback provided following assessment?
- Was goal setting provided?
- Was a home exercise program or home strategies provided?
- Were the goals reviewed once therapy was completed?

Table 8: Results from chart audit of 8 children eligible for CDS outreach services

Chart Audit of developmental (0-6 and 6-8) caseload	% (n=)
Eligibility (Total children n=8)	
Eligible for CDS developmental	100% (n=8)
Ineligible	0% (n=0)
Location of Review (Total review n=8)	
Queensland Health Facility	100% (n=8)
Consistent parental attendance	
Consistent parent attendance	100% (n=8)
Inconsistent parent attendance	0% (n=0)
Orientated to CDS	
Orientated to CDS	62.5% (n=5)
Not orientated to CDS	37.5% (n=3)
Developmental assessments guided by parents concerns or questions	
Assessment driven by parent concerns	87.5% (n=7)
Assessment not driven by parent concerns	12.5% (n=1)
Was feedback provided following assessment?	
Received feedback	50% (n=4)
Feedback was offered	*87.5% (n=7)*
Was goal setting provided	
Formal goal setting NOT provided	100% (n=8)
Were home exercise programs (HEP) or home strategies provided	
HEP/strategies provided	50% (n=4)
HEP/strategies not provided	50% (n=4)
Review of Goals *Unable to comment as goal setting was not performed*	N/A

Definitions:
"Eligible for CDS" = as per CDS eligibility criteria - requiring 2/3 disciplines, and not eligible for other services
"Location of Review" = either Queensland Health facility, or at early childcare, school or home environment
"Orientated to CDS" = undertaken formal Orientation to CDS as per 2014/2015 CDS operational plan via phone call.
"Developmental assessments guided by parents concerns or questions" = assessments led by parental questions and reports written in response to these
"Feedback" = formal feedback provided following assessment - only accepted if written in progress note as a feedback session
"Goal Setting" = formalised goal setting with parents driving the goal setting
"HEP" = home exercise program or strategies provided for home practice
"Review of Goals" = review of goals following therapy block and re-setting/evaluating as appropriate
"Number of Reviews" = the amount of times the child was seen by CDS in the 12 month period
"Discharged" = had the child been discharged or transitioned from CDS and for what reason

Findings from Chart Audit

Family centred practices that encourage parents to be the drivers in their child's developmental journey have also improved with the interim model of care compared to the existing model.

- 100% of children seen were eligible for a child development service, were reviewed in a Queensland Health facility and had consistent parental attendance.
- 62.5% (n=5) of families were provided with an orientation phone call prior to first contact with the outreach team. This is a jump from 0% in the previous model.
- The interim model saw an almost 25% (87.5% compared to 63.2%) increase of assessments being driven by parental questions and concerns.
- There was an increase of families being offered (87.5%) and receiving (50%) feedback sessions compared to previous model (34.2% received feedback).

- There was an increased provision of home exercise program and strategies (usually at the time of feedback) with the interim model (50%) compared to the existing model (42%).
- Provision of goal setting remained unchanged (0%) - further exploration is required to determine how to better support this to occur in an outreach clinic.

In summary, following the 3 month trial of the interim model in Charters Towers, data quantitatively demonstrated increased referral rates and increased clinical services. These results were hypothesised to be due to an increased presence in the community. Of equal significance are the results of the qualitative data and whether the service provided during the interim period, is one that is more closely aligned with Child Development Service Townsville local model and encompasses the principles and standards for delivery of care for child development services.

CDS Townsville Clinicians' Perceptions

4 clinicians (occupational therapist, speech pathologist and 2x physiotherapists) provided clinical services to Charters Towers in the 3 month pilot period. A simple survey was sent to these clinicians to evaluate their perceptions of the pilot. 75% (n=3) responded to the survey.

Key findings of the survey are:
 Perceived benefits-
- Families were able to be reviewed more regularly - allowing for further assessment in a timely manner.
- Increased multidisciplinary input due to the addition of a speech pathologist to the clinic.
- Feedback was able to be provided in a timely and face-to-face manner.
- Consistent staffing to the service demonstrated enhanced relationships and rapport with local clinicians and families and also improves outreach clinic consistency.
 Perceived challenges
- Limited physical clinic space (separate quiet spaces required for more complex assessments), shared clinical area with local teams (may be disruptive with children in an adult therapy space), limited access to computers, reduced discipline resources and assessments (due to being shared by CDS Townsville clinicians)
- To provide the 'orientation' to CDS via telephone increased the work load and time taken to book appointments.
- 66.6% (n=2) clinicians reported difficulties completing required clinical documentation (including reports/summaries) in designated "outreach time"

- 100% (n=3) of clinicians felt that feedback sessions were most appropriate when delivered either face-to-face or by telephone. Videoconferencing was identified as a potentially useful contribution to the clinic, but consideration of family circumstances and travel to the centre would need to be made.
- 100% (n=3) reported that both a clinic coordinator and administration officer would be useful additions to the team to support the clinical staff.

Overall Analysis of the Interim Model of Care

Data collected from the 3 month trial of the interim model in Charters Towers indicated positive outcomes with respect to activity, engagement and satisfaction. It can be hypothesised that this enhanced service model could be successfully implemented in other communities.

Evaluation over a longer period would allow observation of data trends. It is hypothesised that the increased referral rates and occasions of service directly relate to the increased frequency of clinics, enhanced visibility within the community and the addition of a speech pathologist to the outreach service. Whilst referral and attendance rates will continue to be important quantitative measures of activity, early identification of developmental delay (measured by age of child at referral) will provide an outcome measure for evaluating community awareness of developmental impairment and early intervention. This may provide a better indication of the success of the model.

It will be essential to continue to evaluate consumer and community satisfaction and the presence of cross sector and agency partnerships to determine if the model is meeting the needs of each individual community.

5.   Moving Forward

Summary of Recommendations

Evidence from the Literature Suggests that Child Development Outreach Services will:
- Be supported by appropriate policy, governance, leadership and funding,
- Have community consultation and participation,
- Provide a service that is flexible and innovative to meet local needs,
- Partner with key stakeholders (including families) and be integrated and collaborative with existing service providers,
- Be regular and predictable in nature,
- Be multidisciplinary in approach,
- Provide early intervention services that are guided by family-centred and transdisciplinary care practices
- Provide timely provision of feedback and education,
- Utilise telehealth and technology to support the service when not physically in town, and
- Be culturally safe; use appropriate language and communication for Indigenous families, understanding child development within the cultural context.

THHS Consumer Feedback:
- Limited access to health disciplines in rural and remote communities. Services drastically reduce once a child reaches school-age.
- Child psychology/ social work indentified as most lacking service with speech pathology/occupational therapy/ physiotherapy and visiting paediatrician (specifically Ingham) equally lacking in the communities.
- "Parent's understanding their child's needs", "increased frequency of visits", "communication with existing services (including day care and education department)", "screening clinics" and "transdisciplinary assessments", were identified as most important contributions of a child development service.
- Shared-care models, co-ordination and communication with existing services within the community are identified as important.
- Working collaboratively and culturally appropriately within the communities is required.

Evaluation of Three Month Interim Model:
- The combination of increased frequency of visits and increased speech pathology services led to double the occasion of services, and nearly tripled referral rates in a 3 month period.
- Interim model outreach service had increased family-centred practice (orientation to service, parent led assessments, feedback and home exercise programs/strategies).
- Clinicians' perceived benefits included: improved rapport and relationships (with family and local clinicians) and increased ability to provide comprehensive assessments and feedback due to frequency of visits.
- Clinicians' agreed that a clinic coordinator and administrative officer roles would be important additions to the outreach team.

CDS Townsville Outreach Service: Response to the Recommendations

In light of the recommendations from the literature review, 3 month pilot model, feedback from caregivers, clinicians and stakeholders CDS Townsville's interpretation of implementing an outreach model is:

1. A budget that supports the following is required:
   - A visit every 6 weeks for 3 clinicians (rotating OT/PT/SP/SW or PY depending on need at time of clinic) to each of the following outreach sites:
     - Ingham – daytrip,
     - Ayr/Burdekin/Home Hill – daytrip,
     - Palm Island – daytrip,
     - Charter Towers - daytrip,
     - Hughenden and Richmond – 2 day trip
   - HP4 Speech Pathology (0.4fte), HP4 Occupational Therapy (0.4fte), HP4 Physiotherapy (0.4fte), who have combined roles of outreach clinician and clinic co-coordinator
   - HP4 Social Work or Psychology (0.2fte) –as identified as an area of unmet need by consumers and by the community in THHS outreach communities.
   - AO3 Administration/Bookings support of the clinic (0.2fte)
   - Associated accommodation (for overnight trip to Hughenden/Richmond), travel (car expenses for day and overnight trips and flights to and from Palm Island) and information technology costs (including computer access).

Funding was secured for the above resources from the System Planning Branch 2015-16 and 2016-27 rounds of the Revitalisation of Regional, Rural and Remote health services program funding.

2. Outreach services within local communities will have flexibility including:
   - Access to screening clinics if identified as a need in a community
   - Access to parent/community education sessions around childhood development, early intervention or transition to Prep etc, and can be collaborative with schools/ daycares / kindergartens or other NGO and community groups
   - Access to 'drop-in' clinics or 'single session' clinics will be further explored.
   - Location of clinics will primarily be at Queensland Health facilities; however home visits can be offered to those families who are more disadvantaged or where travel to access clinics is problematic. Palm Island clinic locations can be flexible from visit to visit – at the Joyce Palmer Health Centre, Palm Island Community Company (PICC), at either of the schools or at appropriate meeting places within the community, for improved cultural sensitivity.
   - Ability to provide multidiscipline 6-8 years assessment clinics for school-aged children

3. The outreach clinic will take place on a Monday (and Tuesday – for Hughenden/Richmond trip) to best utilise the sharing of assessments and resources between CDS Townsville clinics and the outreach clinic, work around CDS Townsville operational times and allow for consistency with the outreach communities. NB: Where a public holiday falls on a Monday, the outreach visit will be scheduled for the following week.

4. Assistive technologies including telephone and video conferencing consultations will be utilised for the potential to provide orientation to the service, provide feedback, goal setting, and follow up reviews with the service.

5. Collaboration with existing services, education system, community groups and other NGOs is encouraged and expected.

6. Additional cultural awareness training can be further investigated if clinicians identify the need.

6. Limitations/Conflict of interest

This literature review was not peer reviewed. The author reports no conflicts of interest. The author alone is responsible for the content and writing of the paper.

This work has been reviewed and edited by Child Development Service Project Manager, Statewide Child and Youth Clinical Network-Child Development Subnetwork Principal Project Officer and the Townsville Hospital and Health Service Allied Health Research Fellow.

7. Appendices

Appendix 1: Evidence from Literature Review

Table 2: State and national frameworks for rural and remote health care provision.

Framework	Year	State/National	Goals/Principles
Healthy Horizons	1998	National	• Improving the highest health priorities first • Improving the health of Aboriginal and Torres Strait Islander peoples • Undertaking research specific to rural and remote Australia • Developing flexible and coordinated services • Maintaining a skilled and responsive workforce • Developing needs based on flexible funding arrangements • Achieving recognition that rural, regional and remote health is an important component of the Australian health care system
National Strategic Framework for Rural and Remote Health	2012	National	Replaced the Healthy Horizons Framework. Five key outcome areas: • Access • Service models and models of care • Health workforce • Collaborative partnerships and planning • Strong leadership, governance, transparency and performance
Blueprint for better healthcare in Queensland	2013	State - Queensland	• Health services focused on patients and people • Empowering the community and our health workforce • Providing Queenslanders with value in health services • Investing, innovating and planning for the future

The Queensland rural and remote health service framework	2013	State - Queensland	• Improve the health equity of those living in rural and remote Queensland
			• Support rural and remote Queenslanders in accessing a sustainable range of health services
			• Plan and operate locally determined health services that better meet health needs of rural and remote communities. These need to be:
			  - person focused
			  - improving population health outcomes
			  - quality services
			  - safe services
			  - sustainable services
			  - accessible services
			  - culturally appropriate services

Better Health for the Bush: A plan for safe, applicable healthcare for rural and remote Queensland	2014	State – Queensland	Expands on existing initiatives (Blueprint and Qld rural and remote framework) to bring together local and state-wide perspectives health system innovations and protocols. • Defines clearer service capability standards • Outlines how improved collaboration and coordination allows clinicians greater access to support and encourage innovation • Delivers reliable and accessible health system performance information in a transparent format • Defines how co-located services will more effectively share resources and leverage onsite clinical expertise • Highlights how investment in facilities will best serve Qld's rural and remote communities • Explains how expanded use of telehealth and new technologies will broaden scope of locally-available healthcare • Enables the attraction and retention of clinicians and how ongoing training will be provided to develop and sustain the capacity of the workforce • Demonstrates how local rural and remote services, supported by a broader network, can provide healthcare closer to a patient's home.

(Commonwealth of Australia, 2012; Sheppard, 2005; State of Queensland, 2013a; State of Queensland, 2013c; State of Queensland, 2014)

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Table 3: Components required or impacting successful and sustainable outreach models of care

Author (Year published)	Article title	Model of Care / Health professional	Components required for success/sustainability	Components that negatively impact on success/sustainability
Allan, J., Ball, P., & Alston, M. (2007)	Developing sustainable models of rural health care: a community development approach	N/A – policy	• Needs identification and needs analysis for service planning • Each community is different • Flexibility in service provision • Role diversity for therapists	• Part-time, fragmented services trying to do everything for everyone is not sustainable
Battye, K. M., & McTaggart, K. (2003)	Development of a model for sustainable delivery of outreach allied health services to remote north-west Queensland	Primary healthcare model – allied health professionals in North West Qld	• Community input into development of service, service delivery and ongoing evaluation phase • Service meets needs of community • Regular services • Hub and spoke model • Recruitment and retention of allied health professionals • Integration with other health service providers • Appropriate client follow up when service not in town • Primary healthcare framework; focusing on health education, health promotion, early intervention, primary prevention, treatment, secondary prevention and chronic disease management	• Lack of notice when the visiting service was coming = low attendance rates • Poor coordination with other visiting services resulting in "bombardment" of communities • Visits being too short in duration and infrequent • Inconsistent outreach personnel resulting in decreased ability to build rapport and trust with the client • Inadequate cultural awareness • Poor promotion of service to community and surrounding areas (stations/properties) • Communication inappropriate to the level of the community/culture
Birks, M., Mills, J., Francis, K., Coyle, M., Davis, J., & Jones, J. (2010)	Models of health service delivery in remote or isolated areas of Queensland: a multiple case study	Primary health care – nurses in remote Qld	• Community consultation is the foundation on which the model is established - community need, current infrastructure, staffing mix, delivery modes, policy and resources • Community participation important for improving health outcomes for individuals/families/community • Emphasis on primary healthcare • Multidisciplinary approach (including resident and non-resident health professionals) • Use of technology	
Dew, A., Veitch, C., Lincoln, M., Brentnall, J., Bulkeley, K., Gallego, G., Bundy, A., & Griffiths, S. (2012)	The need for new models for delivery of therapy intervention to people with a disability in rural and remote areas of Australia	Disability sector - allied health professionals in rural NSW	• "Hub and spoke" model • Innovative service delivery • Collaboration between rural and remote therapists • Meet local community needs • Increased use of technology	
Dew, A., Bulkeley, K., Veitch, C., Bundy, A., Gallego, G., Lincoln, M., Brentnall, J., & Griffiths, S. (2013)	Addressing the barriers to accessing therapy services in rural and remote areas	Disability Services model – allied health professionals in rural NSW	• Person-centred • Place based – to build individual, carer, and local community capacity using social, economic and community-based resources • Flexible and innovative models that build on	• Lack of allied health professionals • Travelling to access services • Long wait times for services • Working in professional silos

			• existing local options • Tailored to local needs • Promote cross-agency collaboration • Utilise technology	
Gruen, R., Bailie, R., Wang, Z., Heard, S., & O'Rourke, I. (2006)	Specialist outreach to isolated and disadvantaged communities: a population-based study	Surgical specialists outreach to Indigenous communities in NT	• Each community is different • Needs to have an adequate and motivated workforce (specialists) • Linked in with a functioning primary-health care service • Be predictable in visits and responsive to local needs • Integrate with local services • Virtual outreach (telehealth) beneficial if appropriate infrastructure is available • Consultative role and relationship-building is important	
Humphreys, J., Wakerman, J., Wells, R. (2006)	What do we mean by sustainable rural health services? Implications for rural health research	N/A - policy	• Increased use of telehealth • Periodic visiting services • Service integration important • Based on community needs • Sustainability requires robust systems-based solutions that continue to monitor and adjust to the changing needs of a community • Collaboration between service providers • Needs ongoing research into sustainability deliverables	• Recruiting and retaining an adequate workforce • Managers and management structure are lacking • Communities are geographically isolated • A sustainable model is not one that is dependent on one key element (such as a particular person or propped up by goodwill gestures)
Wakerman, J. (2009)	Innovative rural and remote primary health care models: What do we know and what are the research priorities?	Primary healthcare medical model – rural and remote communities in Australia	• Adequate funding • Community participation • Health information systems • Multidisciplinary practice • Vision or leadership • Adequate information technology • Need to be appropriate to context (meet local needs) • Need to have capacity to change and adapt (flexible models)	• Lack of evaluation and effective monitoring of the service • Working in professional silos
Wakerman, J., Humphreys, J., Wells, R., Kuipers, P., Entwistle, P., & Jones, J. (2008)	Primary health care delivery models in rural and remote Australia - a systematic review	Primary healthcare medical model – rural and remote Australia	• Hub and spoke, fly-in/ fly-out, virtual clinics or telehealth models • Environmental enablers – supportive policy, community readiness, appropriate workforce, • Essential service requirements – funding, governance, management and leadership, integrated services, appropriate infrastructure	

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Table 4: Principles for the successful provision of services to Aboriginal and Torres Strait Islander people

Principles	Article title	Author (Year published)	Key points / Recommendations
Collaboration, Integration and Partnerships	*Increasing community participation in an Aboriginal health service*	Champion, Franks, & Taylor, (2008)	• Aboriginal people themselves, identify that health and social issues are inextricably linked therefore cross-sector collaboration is important for service provision.

	Cross-sector collaborations in Aboriginal and Torres Strait Islander childhood disability: a systematic integrative review and theory-based synthesis	Green, et al. (2014)	• The complex nature of childhood development, particularly for Aboriginal and Torres Islander children has seen the recognition for a shift from a purely medical model view of disability to more collaborative approaches
			• Collaborative relationships between health, education and social service sectors is required to reduce confusion and fragmented service provision across government agencies and departments working in professional silos.
			• Engaging the community to build relationships and rapport is important for a successful and sustainable collaborative model.
			• Barriers to collaborative models of care include:
			  - Structure of government departments and agency *(difficult to navigate different waiting lists and assessment processes, receive different information, professionals working in isolation and silos of service provision)*
			  - Lack of communication between service providers *(lack of role clarity and responsibility, duplicate of resources)*
			  - Financial and human resources *(building collaborative and sustainable models take time and resources, funding restraints impede and impact on this)*
			  - Service delivery setting *(delivering services within a culturally safe environment is important. Services provided outside the "clinic" environment is beneficial -*
			  - *either at a school or community centre - to help reduce stigma associated with having to attend "clinic" services)*

	Outreach and improved access to specialist services for indigenous people in remote Australia: the requirements for sustainability	Gruen et al., (2002)	• Partnerships with local services allow the outreach service to coordinate and further build on resources and skills that are available locally.
	Culture, context and therapeutic processes: delivering a parent-child intervention in a remote Aboriginal community	Mares & Robinson, (2012)	• Not only working in partnerships with families and the community engagement important to the provision of Indigenous outreach health services, but collaboration and integration with other services is essential.

Principles	Article title /	Author (Year published)	Key points / Recommendations
Community engagement	*Increasing community participation in an Aboriginal health service*	Champion, Franks, & Taylor, (2008)	• Working through the kinship network is fundamental to increasing participation in health planning and service delivery. • There are strong links between family groups and it is integral for health professionals to form relationships with extended family supports • There becomes a lack of community unity where mainstream health models are perceived as not representative of the Indigenous group's interest or needs.
	Indigenous Respiratory Outreach Care: the first 18 months of a specialist respiratory outreach service to rural and remote Indigenous communities in Queensland, Australia	Medlin et al., (2014)	• Consultation with key stakeholders including community Elders, local council representatives, community nurses and Indigenous Health workers is integral. • Well trained and supportive professionals, who work in partnerships with the community, are essential for a successful outreach model. • Partnerships developed on the premise of mutual respect, open communication, equity, community ownership and self-empowerment were most successful
	Ethnic and Indigenous access to early childhood healthcare services in Australia: parents' perceived unmet needs and related barriers	Ou, Chen, Garrett, & Hillman, (2011)	• For successful community engagement the service should: respond to the community needs, have good communication with stakeholders and be well integrated and coordinated with local services for the community. • It should adopt a multidisciplinary team approach, be regular and predictable and provided in a timely manner
Cultural context	*'Hear our stories': Child-rearing practices of a remote Australian Aboriginal community*	Byers, Kulitja, Lowell, & Kruske, (2012)	• Child development cannot be understood or assessed in a cultural vacuum, and must incorporate the cultural context of the child and the carer • Australian Aboriginal people hold different world views to non-Aboriginal Australians and these differences significantly influence health decisions and the uptake of services. • Child health services delivered with Western perspectives, values and frameworks poses risks of delivering a service that is not culturally safe or sensitive. • When health service delivery is by non-Aboriginal service providers, awareness of the differences and understanding of Aboriginal perspectives and practice related to child rearing and child development is required. • Child rearing is shared by all who have a responsibility to the child within the kinship network. This extends beyond the biological mother and father to include all who have a relationship to that child • Health care providers need have culturally appropriate assessments of child development and target health actions towards family and wider community members rather than the individual child or carer.
	Culture, context and therapeutic processes: delivering a parent-child intervention in a remote Aboriginal community	Mares & Robinson (2012)	• Cultural and contextual factors influence communication, relationships and therapeutic processes for children and families in remote Aboriginal communities. • Most parents and children attending an outreach service have no prior experience of therapy/interventions. The unfamiliar situation could be potentially anxiety provoking and overwhelming for both the child and caregiver.

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Principles	Article title /	Author (Year published)	Key points / Recommendations
Cultural awareness and sensitivity	*Development of a model for sustainable delivery of outreach allied health services to remote north-west Queensland, Australia*	Battye & McTaggart, (2003)	• Health professionals should be accessible at sites removed from the hospital or clinic setting – as in many Indigenous communities there is unwillingness for people to attend hospitals or health clinics as it is seen as only a place to go when sick and is associated with death
	Models of health service delivery in remote or isolated areas of Queensland: a multiple case study	Birks et al., (2010)	• Indigenous health workers should be the 'primary vehicle in which health care is delivered in Indigenous communities'. • Indigenous leadership within health care services would facilitate a more client-centred or holistic and culturally safe service.
	Culture, context and therapeutic processes: delivering a parent-child intervention in a remote Aboriginal community	Mares and Robinson (2012)	• Aboriginal people found it more culturally relevant when the therapists introduced self in relation to place or family (where they were born, who was in their family, how many children etc) and not with descriptions of professional qualifications. • This enables the Aboriginal caregivers to identify potential commonalities with the therapist as opposed to alienating the family with health literacy that was not understood or perceived relevant to the Indigenous people.
	Indigenous Respiratory Outreach Care: the first 18 months of a specialist respiratory outreach service to rural and remote Indigenous communities in Queensland, Australia	Medlin et al., (2014)	• Local Indigenous Health Workers play a vital role to assist with the delivery of service. • Role includes: sharing of community knowledge, liaison, advocacy, and assisting with follow up
Communication	*Cross-sector collaborations in Aboriginal and Torres Strait Islander childhood disability: a systematic integrative review and theory-based synthesis*	Green et al. (2014)	• Respectful communication and culturally appropriate program delivery is integral
	Culture, context and therapeutic processes: delivering a parent-child intervention in a remote Aboriginal community	Mares and Robinson (2012)	• Culturally appropriate language and communication has a significant impact on family engagement and successful therapeutic processes. • A recommendation was to utilise local community members and Indigenous Health Workers where possible during service provision to assist with language and cultural differences, resulting in improved family engagement.

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Appendix 2: CDS Townsville Outreach Service: Identifying the Need for Change

In line with the release of evidence for contemporary child development services in 2013, Child Development Service (CDS) Townsville reviewed and remodelled local service delivery to align more closely with the principles of practice and the core business of specialist child development services.

The remodel of local service delivery was the precedence for a review of the outreach service model. Between January and March 2015, HBCIS data was analysed and a chart audit was performed to identify the quality of service provided on outreach clinics and whether this service aligned with the CDS Townsville local model.

A chart audit was undertaken of the 54 children who accessed the CDS Outreach service in the 2014-2015 financial years to give an indication of the type of service being provided. Out of 54 total children reviewed in the 12 month period (with a total of 83 occasions of service (OOS)) only 38 of those children (OOS 58) were children that would be eligible for CDS from a developmental (0-6 years clinic or 6-8 clinic) point of view. It was these 38 children that were included in the chart audit.
Areas included in the audit were:
- Was the child eligible for CDS?
- Where was the child reviewed?
- Was there consistent parental attendance and engagement at reviews?
- Were the family orientated to CDS?
- Were parent's developmental questions used to guide assessment process?
- Was feedback provided following assessment?
- Was goal setting provided?
- Was a home exercise program or home strategies provided?
- Were the goals reviewed once therapy was completed?
- Was the child discharged/transitioned to another service?

Findings from Chart Audit
- Existing outreach model of care is not aligned with the CDS Townsville local model of care – it is inefficient and ineffective, dislocated from local service providers, and was delivered in a way that was not evidence based or family focused.
- 70% of children seen – multidisciplinary developmental clinics (0-6 clinic and 6-8 clinic)
- Remaining 30% (n=16) children seen – single discipline clinics (gait or plagiocephaly follow-up), or Juvenile Idiopathic Arthritis (JIA), Spina Bifida or Cerebral Palsy follow up.
- Of the 10 children offered reviews in *non*-Queensland Health facilities, 60% (n=6) of these did not have consistent parental attendance.
- More than a 1/3 (36.8%) of parents did not identify questions or concerns regarding their child at the time of the initial assessment and therefore multidisciplinary assessments were not guided by these questions.
- Almost 2/3 (65.8%) of families were not provided with feedback as part of the assessment process.
- 100% of families were not supported to goal set following assessment and feedback.
- Approximately 40% (42.1%) of parents were provided with home exercise programs or home based strategies.
- Children were seen an average of 1.5 times (between 1 and 4 times) by the outreach service before discharge or transition to another service.

The Revitalisation of Regional, Rural and Remote Health Services Project was the catalyst for which change could occur. It provided the opportunity for funding to be allocated to develop a new model of care based on the most recent evidence. The first 12 months of the funding was allocated to developing the model, with the funding from July 2016 allocated against staffing and resources to deliver clinical services under the new model.

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