# Healthy Moms, Babies, and Children: Improving the Health of Aboriginal Populations in Canada


Alberta Centre for Child, Family and Community Research

This report was funded by the First Nations and Inuit Health Branch, Health Canada. Opinions expressed in this publication are those of the authors and do not necessarily express the official policy of Health Canada or The Alberta Centre for Child, Family, and Community Research.

Suggested citations
For Call to Action: Tough SA. “Call to Action. In” Healthy Moms Babies and Children: Improving the Health of Aboriginal Populations in Canada. Ed. Alberta Centre for Child, Family and Community Research. Edmonton: 2009. 5-8.

For the Research Synthesis Review: McNeil DA, Rikhy S, Siever J, Johnston A, Goitom M, & Tough S. “Recent Promising Practices to Improve the Health and Well-being of Aboriginal Women and Children”. In Healthy Moms Babies and Children: Improving the Health of Aboriginal Populations in Canada. Ed. Alberta Centre for Child, Family and Community Research. Edmonton: 2010. 9-156.

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## Foreword

I am excited to share with you our report Healthy Moms Babies and Children: Improving the Health of Aboriginal Populations in Canada.

We hope that through this report we all have a better understanding of the issues and actions needed to improve the health and well-being of Aboriginal people in Canada.

This work began with conversation – with members of Health Canada, the Aboriginal community, researchers, frontline workers, and policymakers – and so it is fitting that we begin this report with an invitation to continue the conversation with our *Call To Action.*

We encourage you to share your thoughts by responding to our *Call To Action* on our website: **www.research4children.com**

A summary of comments will be posted online to continue the conversation.

Respectfully submitted,

Nancy Reynolds
President and CEO
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## Call to Action

Change can occur from a place of inspiration or desperation. Some of the information here may paint a picture of desperation. On closer look however, the voices of youth, young adults and emerging leaders provide a guiding light of inspiration. Capitalizing on the creative spirit and talent of the next generation of economic, technical, social, political and spiritual leaders gives hope for sustainable change in the well being of Aboriginal Canadians.

Indeed, it is conceivable that the holistic concepts of health held sacred by Aboriginal Canadians, when manifest, will inspire the hearts, minds and actions of all Canadians. In this way, all beings can be enriched through a deeper respect and understanding of each other.

These comments, informed by the report ***Recent Promising Practices to Improve the Health and Well-being of Aboriginal Women and Children*** are intended to complement recent relevant and related work contained in high quality technical, academic and policy reports, including the *Indigenous Children's Health Report* by Janet Smylie and Paul Adomako[1], the special issue of Horizons; *Hope or Heartbreak*, a joint collaboration between the Government of Canada's Policy Research Initiative and the Research and Analysis Directorate at Indian and Northern Affairs Canada[2], *Reaching for the Top;* A Report by the Advisor on Healthy Children and Youth, Dr. Kellie Leitch,[3] *Out of the Shadows as Last*; Transforming Mental Health, Mental Illness and Addiction Services In Canada,[4] *Dances with Dependency; Indigenous Success through Self Reliance* by Calvin Helin[5] and *The New Millennial* by Reginald Bibby[6]. Further, these comments are informed by an earlier report prepared by the Alberta Centre for Child Family and Community Research which can be found at www.research4children.com titled *"The Maternal, Reproductive and Child Well Being of Aboriginal Populations in Canada: Interim Report, March 2009"*.[7]

It is the hope that this material can be of value in advocacy, research and program and policy development to enhance the well being of First Nation, Inuit and Métis peoples in Canada. Throughout this report, the term Aboriginal is used to refer to First Nations, Inuit and Métis people, living on and off reserve, in urban, rural or remote locations. The limitations of presenting this information as collective are acknowledged, and it is hoped that future opportunities will allow for important sub group distinctions and analysis.

**Preconception, Prenatal and Postnatal Well Being**

The data are clear. The reproductive health outcomes of Aboriginal Canadians are poor. They are at high risk of preterm birth, prenatal alcohol exposure, inadequate prenatal care, poor mental health, low social support, high stress, and poverty.

Failure to address the underlying causes of poor birth and reproductive outcomes, including those associated with preconception health and knowledge, access to prenatal care and local birthing opportunities, and post partum support guarantees

continued suboptimal outcomes for Aboriginal infants, women, families, and communities.

With the exception of research on models of birth practice that allow for delivery closer to home, the majority of the 'best evidence' addresses the remediation of risk at an individual level, such as prevention of HIV transmission, or Fetal Alcohol Spectrum Disorders. Evidence from the best practice review suggests that the body of scientific knowledge on which to make recommendations is limited. Further, while maternal and child health has been identified in national and provincial policy and information documents as a persistent area of concern, and while research and program funds have been allocated in this area, there is a paucity of discussion about preventing poor outcomes through addressing underlying causes. For example, there is limited consideration in most written material between strategies to 'address' fetal alcohol spectrum disorder (outcome) and substance abuse (input); or parenting competency (outcome) and unplanned early pregnancy (input); poverty (outcome) and high school completion (input). Regardless, this information, combined with data and information from technical reports, policy briefs, community leaders and content experts must be used as a basis for next steps. The absence of a plethora of scientific evidence on program impact is not an excuse for inaction.

The complexity of the issues related to reproductive and child health require identification of context in which the behaviour occurs if effective opportunities for positive change are to be created; like the reason for smoking compared to ill effects of cigarette use.

**Aboriginal Children and Youth**

Again, the data are clear. The circumstances in which many Aboriginal children are growing up violate many of the United Nations Convention on the Rights of the Child, to which Canada is a signatory[8]. Moderate to severe food insecurity is experienced by 33% of Aboriginal families, compared to 9% of non-Aboriginal families, and access to nutritious food is twice as costly for those in rural, remote/Northern locations. Between 10% and 21% live in environments where the water is unsafe or contaminated[1]. Unemployment rates in excess of 30% are over four times the Canadian rate (among those over age 15 years),[1] and 41% of Aboriginal children living off reserve, live in poverty.[5] Aboriginal children are more likely than non-Aboriginal to live in rental accommodation, in overcrowded conditions or in homes in need of major repair.[1] As in maternal and reproductive health, there are gaps between thematic issues highlighted in policy and program report and risk to health. Indeed, although data indicate higher rates of substance abuse among Aboriginal youth, none of the following documents highlight substance abuse as a target issue for Aboriginal health: *Reaching for the Top: A Report by the Advisor on Health Children and Youth, CIHR Strategic Plan to Resolve Critical Aboriginal Health Issues, Aboriginal Children's Health Research Agenda Report 2005* and the *Aboriginal Policy Research Conference Syllabus, March 2009.*

Despite these dire physical circumstances, there is optimism among the youth. The aspirations of Aboriginal teens suggest that over 75%, living either on or off reserve,

believe that anyone who works hard can rise to the top, they will get the job they want, they will live more comfortably than their parents, and they will marry. Fifty one percent of Aboriginal teens off reserve and 39% of those on reserve expect to graduate from university with a degree.[6]

Consequently, strategies to improve the physical and social environment which are based on sustainable culturally considerate principles of ownership, control, access and possession[9] (OCAP), combined with the vision and energy of the upcoming generation provide hope for the future.

**Specific Recommendations**

To improve outcomes for Aboriginal Canadians, particularly as relates to reproductive, maternal, and child health the following require immediate and sustained attention:

1. **Preconception Health**: Investments in culturally and community considerate preconception health education, programs and strategies is of paramount importance to reduce the incidence and outcomes associated with unplanned pregnancies, alcohol exposed pregnancies, sexually transmitted disease, risky prenatal behaviours, unwanted parenting and suboptimal educational attainment among young parents. The lack of published information on evidence based programs in this area indicate that projects be developed along the continuum from evaluation to research, and be based on the well defined principles of community development and guidelines for collaboration in Aboriginal communities.
   - **Outcome**: improved health prior to pregnancy for improved maternal, infant and family outcomes, improved understanding of biology and reproduction, reduction in unplanned pregnancy, reduction in teen pregnancy, improved attention to prenatal and post partum health practices including those associated with substance use and nutrition

2. **Midwifery**: Midwifery and birthing support models that increase the opportunity for low risk pregnant women to deliver in their home community have evidence of safety, acceptability and effectiveness. These, and other promising programs and strategies that are culturally and linguistically considerate, should be reviewed to identify success factors that could be generalized across setting. The unintended positive outcomes of local midwifery care should be included in evaluations of impact, e.g. improved maternal mental health, capacity building, local health care providers as role models. Midwifery approaches may be amenable to expansion to address preconception health and culturally competent parenting. This expanded content expertise and job description may increase the economic feasibility of this model in communities where birth numbers are low.
   - **Outcome**: improved adherence to prenatal advice, improved maternal mental health, reduced rates of post partum depression, improved infant attachment with mother and family, increased rates of breastfeeding, community capacity building and the development of local role models

3. **Parenting**: Investments in culturally and community considerate post partum and parenting programs and strategies is of paramount importance to address issues of breastfeeding, bonding and attachment, well baby care, immunization, and oral health to optimize the opportunities for early development and learning. The lack of published information on evidence based programs in this area indicate that projects be developed along the continuum from evaluation to research, and be based on the well defined principles of community development and guidelines for collaboration in Aboriginal communities.
   - **Outcome**: improved knowledge of culturally appropriate strategies for child development, improved parenting behaviours, improved parenting expectations, reduced parental stress, improved early childhood outcomes across the domains of physical, social, emotional and cognitive development

4. **Youth Leadership and Development**: Strategies that build youth capacity across the domains of intellectual, technical, social and cultural development should be implemented and evaluated. These programs are critical to address the current gaps noted in adolescent and reproductive health, and would reduce the risk of unplanned pregnancy, unsupported parenting, substance use and misuse, and would increase educational achievement among youth.
   - **Outcome**: improved high school completion rates and increased rates of post secondary training, reduction in teen pregnancy, reduction in adolescent substance abuse, reduction in unplanned pregnancy, increased youth awareness of culture and traditional practices, improved youth mental and physical health, reduction in youth suicide.

These recommendations are offered within the context of the findings from the *Promising Practices Review*. The Centre acknowledges and appreciates the time, dedication and thorough approach adopted by the research team under the leadership of Dr. Debbie McNeil. This is not an exhaustive review of programs, or program evaluations and it is recognized that there are numerous programs and services that are enhancing the lives of Aboriginal peoples and communities that were not eligible for inclusion. Regardless, the evidence suggests opportunities for action to improve Aboriginal health.

The Alberta Centre for Child Family and Community Research would welcome the opportunity to begin a conversation on this report, and extends an invitation for feedback on this “Call to Action”.

Respectfully offered,

Suzanne Tough, PhD
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# Recent Promising Practices to Improve the Health and Well-being of Aboriginal Women and Children


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## Acknowledgements

We would like to acknowledge the contributions of Courtney Crockett, Patrick O'Connell, and Sarah Horn in the development of this report. These individuals provided ongoing support and insight into the research process and findings.

We would also like to thank the content experts that were contacted for their input on emerging issues in Aboriginal health. Your insights and recommendations have shaped our findings and we are grateful for your contribution.

Finally, we would like to acknowledge the Aboriginal Advisory Committee of the Alberta Centre for Child, Family, & Community Research. These individuals were instrumental in the development of a tool to assess cultural sensitivity and alignment for research reports. It is with respect and gratitude that we acknowledge their participation and support.

# Executive Summary

## Introduction

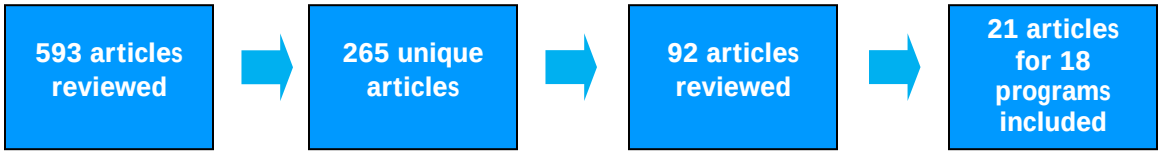
Health disparities between the Aboriginal and the general population in Canada, Australia, New Zealand and the United States, specifically among infants and children, highlight the need to improve the health and well-being of this population. Aboriginal children experience infant mortality rates 1.7 to 4 times higher than non-Aboriginal infants, as well as higher rates of sudden infant death syndrome, childhood injury, accidental death, suicide, ear infection, dental caries, and respiratory tract illness.[1] Increased exposure of Aboriginal children to toxins and contaminants, including tobacco and alcohol[1] suggests, that in order to improve Aboriginal children's well-being, there is a need to improve Aboriginal health across multiple domains. As such, this review identifies promising practices to improve maternal, reproductive, newborn and child health, recognizing that improving health in any of these domains may generate momentum to create sustained health improvements.

## Methods

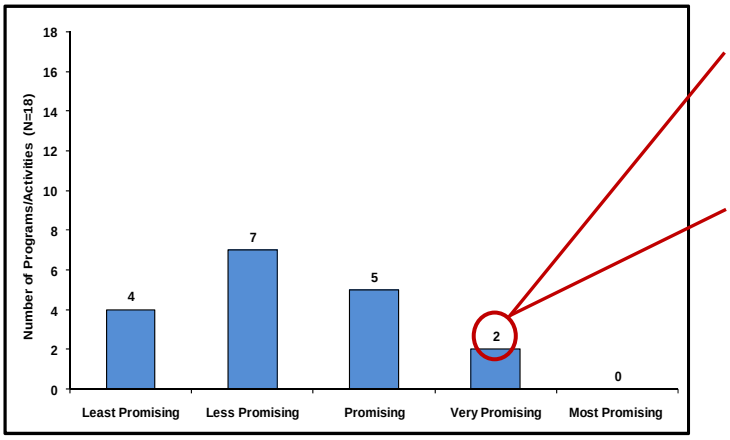
To better understand recent practices that aim to improve Aboriginal health and well-being, two systematic searches (one for maternal, reproductive, & newborn health and another for child health & well-being) of existing peer-reviewed literature published after 2004 were conducted. Publications that identified actionable programs or activities were appraised for scientific rigour, cultural sensitivity, and cultural alignment. Those programs or activities that showed evidence of having positive outcomes; were identified as having mid or high in scientific rigour, cultural sensitivity and alignment; and had sufficient program logic, reach and uptake were identified as promising practices.

## Key Results

***Maternal, Reproductive, & Newborn Health***




Two 'very promising practices' were identified from the 18 programs and activities that were included in the maternal, reproductive and newborn review. One Canadian program, 'Delivering Diversity', built local capacity by providing educational training for Aboriginal midwives who could then support local delivery for rural Aboriginal communities. [2] The other program was an Indigenous community-controlled midwifery program in Australia that was cost efficient and demonstrated improvement in antenatal care practices.[3]



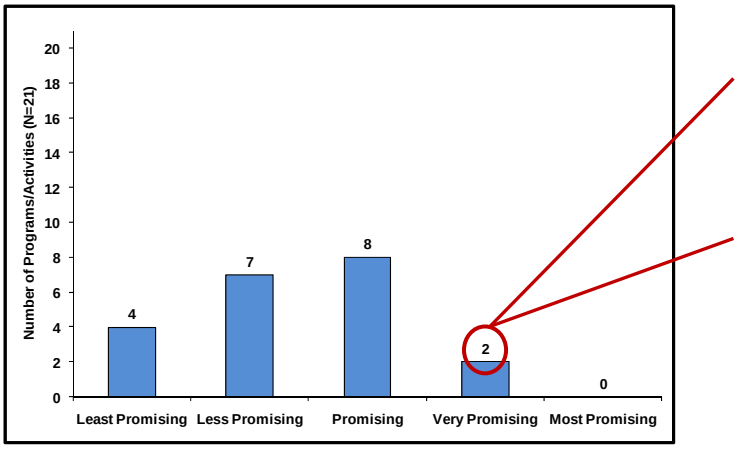

Kreiner M. *Delivering diversity: newly regulated midwifery returns to Manitoba Canada, one community at a time*. Journal of Midwifery and Women's Health 2009; 54 (1); e1-e10

Jan S., Conaty S., Hecker R., Bartlett M., Delaney S., & Capton T. *An holistic economic evaluation of an Aboriginal community-controlled midwifery programmer in Western Sydney.* Journal of Health Services Research & Policy 2004; 9(1);14-21

## Key Results
### *Child Health & Well-being*

**1036 articles reviewed** → **762 unique articles** → **108 articles reviewed** → **22 articles about 21 programs included**

Two programs were identified as 'very promising' from the 21 programs reviewed for child health and well-being. One program in elementary schools on reservations in the United States, using a framework of bicultural competency, reduced the use of smokeless tobacco, alcohol and marijuana.[4] The other 'very promising' practice from Northern Ontario reduced the incidence of dental caries with twice yearly application of fluoride and caregiver dental health education.[5]




Lawrence, HP et al. A 2-year community-randomized controlled trial of fluoride varnish to prevent early childhood caries in Aboriginal children. Community Dentistry and Oral Epidemiology. 2008 ;36(6): 503-516

Schinke, SP, Tepavac, L, Cole KC. Preventing substance abuse among Native American youth: three-year results. Addictive Behavior. 2000;25(3):387-97.

## Conclusions & Implications

1. Although there is limited actionable research in Aboriginal health, Canada has been a leader in culturally sensitive intervention research. Since health disparities continue to persist, it is important to acknowledge and build upon those efforts.
2. A variety of well-documented disparities such as unwanted pregnancy, teenage pregnancy, relationship status, infant mortality, maternal obesity, Sudden Infant Death Syndrome, injury, emotional difficulties and suicide have not been well addressed through programming.[1, 6-11]
3. Especially for low risk pregnancies, the pursuit of programs that promote culturally safe, woman and community centered care such as midwifery[2, 3, 12-17] and in particular those that train Aboriginal midwives is warrented.[2]
4. Use of peer support and Aboriginal health workers is a potentially promising way to enhance cultural sensitivity and promote culturally safe care, especially when travel for health services outside of the community is required.[15, 16, 18] The use of cultural interpreters is important as Western staff have identified a lack of confidence in addressing culturally sensitive issues with individuals and families.[19]
5. Promising practices in perinatal HIV transmission[20] could be adapted and applied in other settings coupled with strong evaluation methods.
6. In some communities there is a lack of choice for delivery location for women with first pregnancies; mandating a transfer from the community for delivery raises the ethical question of ownership of the decision. Culturally safe care allows women to make an informed decision taking into account the biomedical concept of health risk for mother and baby and the Aboriginal concept of holistic health risk for mother, baby and community. As such, a deeper understanding of self determination and variations in the definition of risk is needed.
7. For those living in highly isolated locations, delivery of health service through the use of technology could provide significant opportunities. Only one identified study used technology to assess health in Aboriginal children.[21] There is opportunity to develop and evaluate culturally safe telehealth services.
8. There is a shortage of recently published and evaluated Canadian programs to prevent substance use in Aboriginal children and youth. There is an opportunity to take the lessons learned in program development and implementation from a very promising American prevention program for elementary students[4] and to carefully adapt this program and its evaluative strategies for use in the Canadian context.
9. Use of fluoride varnish to prevent dental caries in Aboriginal communities was effective.[5, 22, 23] Additional strategies to heighten cultural alignment and sensitivity are needed.
10. Culturally aligned family, school, and community promising practices promoting healthy eating and active living provide opportunities to address the rising rates of Type 2 diabetes and obesity in Aboriginal children.[24-26]
11. A holistic cognitive reading remediation program supported grade 3 students who were most at risk for poor literacy. This study, although small in scope, presents an opportunity to enhance academic proficiency through adaptation in other communities.[27]
12. There were few studies of children living in rural settings. This represents a gap that could be addressed in planning for future programs and research.

13. Given the importance of spirituality and holistic health for Aboriginal people an opportunity exists to address the contribution of spirituality in health.
14. No practices addressed political contributors to health. There may be an opportunity to further understand these contributors and address them through culturally sensitive programming and practices.
15. In alignment with OCAP (Ownership, Control, Access, and Possession),practices that are developed, evaluated, owned or managed by communities, with feasible outcomes aligned to program objectives have a greater opportunity for success as a result of community engagement. [28]

**Key Recommendations**

1. Given Aboriginal Holistic Health Models and the complexity of Aboriginal definitions of health, efforts to reduce 'health' disparities need to address contributors to health such as contextual, cultural, environmental, political, and spiritual factors. In the current Canadian government system, this requires intersectoral and interdisciplinary approaches to health. There is a need for collaboration between government bodies and between sectors to eliminate health disparities.
2. While there has been a great deal of research on Aboriginal health disparities, less than 5% of the identified research papers addressed actionable programs or activities. There is a need for programs and actionable research that is policy and practice relevant.
3. In conducting research within Aboriginal communities, both scientific and Aboriginal ways of knowing need to be adopted to provide evidence in both frameworks. Only one paper ranked high in both scientific rigour and cultural sensitivity and alignment. As demonstrated by this program and study, scientific rigour does not have to be a 'trade off' for cultural sensitivity: it is possible to have both.
4. Improved outcomes for maternal, infant, and child health must be investigated within the context of culturally desirable community capacity building. Singular focus on remediation of risk at the expense of community determination and participation detracts from sustainable improvements in health of individuals and communities.
5. Adoption/adaptation of the promising practices identified in this report along with ongoing and rigourous assessment of effectiveness will contribute the important evidence needed to achieve sustained health improvements.

## Background

Risks to health and well-being among Aboriginal populations are well documented in the areas of maternal, reproductive, newborn, and child health and well-being. Aboriginal teen pregnancy rates are four times higher than for the rest of the Canadian population[1]and teen pregnancy contributes to preterm birth.[29] Although, in the past it was felt that preterm delivery was a concern only in the Inuit population, recent studies identify that preterm delivery, among First Nation members with status in British Columbia, was consistently over 40 to 70% higher than non First Nations, and in Manitoba higher rates of preterm birth were found in First Nations women living off reserve.[1] An estimated 23% of mothers of Aboriginal children reported that they consumed alcohol during their pregnancies[30] contributing to outcomes such as Fetal Alcohol Spectrum Disorder. Based on a review of 19 studies of fetal and/or infant mortality for Aboriginals in Canada, infant mortality rates were persistently and substantially higher in First Nations or Inuit peoples, compared to non Aboriginal populations, despite improvements since the 1970s.[6] Risk to health and well-being for Aboriginal children is not limited to birth outcomes. To name just a few, Sudden Infant Death Syndrome is 3 to 12 times higher; obesity rates are 4 times higher; and between 2001 and 2003 the injury mortality rate was 2.5 times higher; and the risk for clinically significant emotional difficulties was 24% higher in Aboriginal populations compared to non Aboriginal populations.[1]

A number of programs addressing these risks have been launched. A recurrent theme among these programs, particularly in the area of reproductive health, is care closer to home that is driven by the Aboriginal community and incorporates Aboriginal culture. The purpose of this report is to synthesize available evidence and identify promising practices that support maternal, reproductive, newborn, and child health and well-being in Aboriginal populations.

### Context for Maternal, Reproductive, & Newborn Health

Poor reproductive outcomes for infant and mother have been associated with young maternal age[31], lower maternal education[32], being unmarried[7] (19% of Aboriginal women were single parents in 2001, compared to 8% of non-Aboriginal Canadian women)[8], increased Body Mass Index[9], inadequate prenatal care[33], and unplanned pregnancy[10]. Aboriginal women are at increased risk of experiencing each of these risk factors. For example, 64% to 84% percent of teens attending Aboriginal schools report sexual involvement, compared to 44% of other Canadian teens[34], potentially increasing the risk of unplanned or unwanted pregnancy. Finally, factors that adversely influence maternal and infant outcomes, such as smoking, alcohol and drug use, are higher among Aboriginal adolescents and women.[35] Additional adverse influences on pregnancy outcomes include poor maternal social support, mental health, and elevated stress, which are prevalent among Aboriginal women.[36] *It is in this context that efforts to optimize reproductive health from preconception to infancy were considered.*

## Context for Child Health & Well-being

The Aboriginal population is young and growing; approximately one third of the population is less than 14 years of age (compared to 17% of the non-Aboriginal population[37]). Aboriginal children represent 6% of all Canadian children[37] although Aboriginals living in Canada account for only about 4% of the total population.[37]

The aspirations of Aboriginal teens suggest that over 75%, living either on or off reserve, believe that anyone who works hard can 'rise to the top';[34] they will get the job they want, they will live more comfortably than their parents, and will marry[34]. Fifty-one percent of Aboriginal teens living off reserve and 39% of those living on reserve expect to graduate from university.[34] These declarations of optimism provide a tremendous opportunity for substantial return on investments in strategies that develop leadership skills, and that enhance the probability of physical, social, and emotional success for Aboriginals living in Canada.

These teen perspectives occur against a plethora of information that indicate Aboriginal communities are plagued by high rates of unemployment, poverty, poor educational attainment, substance misuse, domestic violence, poor mental health, elevated suicide rates, chronic disease, and lack of access to services.[1, 11] Indeed, while Aboriginals living in Canada represent 3.8% of the total Canadian population, they represent 18% of the incarcerated population, 30% of the child welfare population,[11, 38] and 24.4% of the AIDS-HIV populations.[39]Over 40% of Aboriginal children living off reserve live in poverty.[38]

Family and parenting can be viewed within the context of a shared responsibility in which elders, grandparents, and extended families play an important and essential role. Within this context of interdependence, it is relevant that 29% (on reserve) and 38% (off reserve) of Aboriginal teens report their parents are married to each other, compared to 67% of Canadian teens nationally,[34] which underscores the importance of mentorship and guidance from non-nuclear family members, particularly during the important preconception period of adolescence.

Traditional Aboriginal values have included self reliance, spirituality, interdependence and ethical leadership.[40] While Aboriginal communities and people are not homogeneous, typically the individual is viewed within the context of their family and community and consequently, strategies that disconnect the individual from the collective could violate cultural norms. The opportunity to harness the optimism and vision of youth, within the Aboriginal world view of holistic health and collaborative action, may be a key to improved and sustainable health (and economic) outcomes for Aboriginal children and families.

## Definition of Health

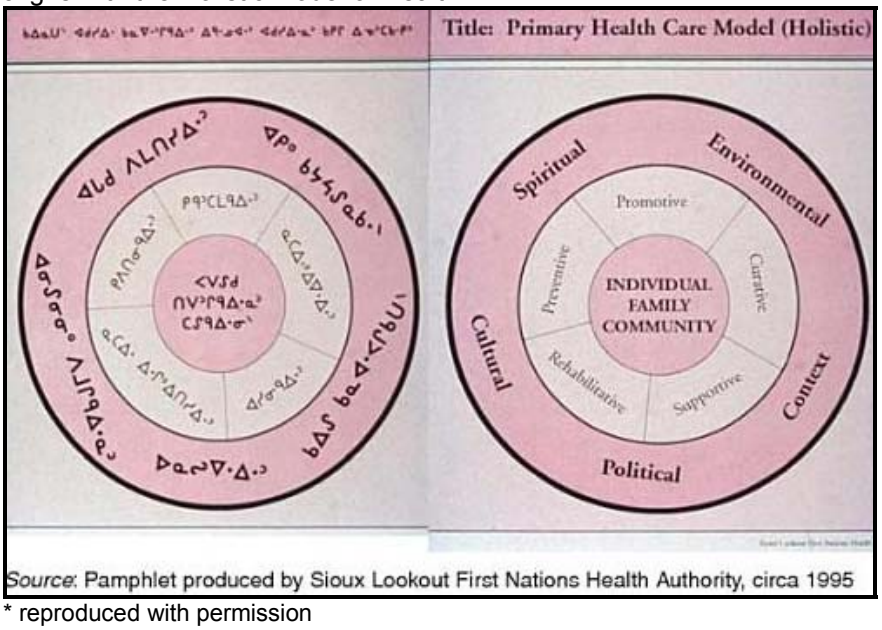
In order to discuss the state of knowledge with regard to programs or activities that may improve maternal, reproductive, newborn or child health and well-being, it is first necessary to better define 'health' both universally and especially for Aboriginal

peoples. Both the World Health Organization (WHO) definition of health (below) as well as the Sioux Lookout First Nations Health Authority[41] definition (Figure 1) provided a conceptual framework for understanding the programs and activities reviewed for this synthesis and our associated recommendations for promising practices and future research.

The WHO defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”.[42] The WHO further asserts that “health is not possible without peace, shelter, education, food, income and a healthy and sustainable physical environment, social justice, and equity… a medical health care system alone cannot maintain health”.[43] As such, this definition recognizes that health is holistic for all populations, including Aboriginal populations, and emphasizes the need to look beyond medical factors when discussing health.

Although the WHO’s definition recognizes that health is more than just a state of physical well-being, a more in-depth model of health, the Holistic Model, has been adopted by some Aboriginal populations. The “Medicine Wheel” was developed to describe determinants of health that reflect the world views of Aboriginal peoples (Figure 1).[41] The Holistic Health Model identifies spiritual, environmental, cultural, political, and contextual contributors to health and well-being. Further, the model identifies a role for the individual, family, and larger community in achieving a state of ‘health’ using mechanisms that are preventive, rehabilitative, supportive, promotive and curative. In considering existing and available practices, it is possible to identify where in the Medicine Wheel the current programming exists and where there are potential gaps in programs and activities.

**Figure 1.** Example of a Medicine Wheel adapted by the Sioux Lookout First Nations Health Authority that aligns with the Holistic Model of Health.[41]




*Source*: Pamphlet produced by Sioux Lookout First Nations Health Authority, circa 1995

* reproduced with permission

**Understanding Cultural Competence, Sensitivity, and Safety**

Linguistic, ethnic, economic, and cultural differences impact how communities use and access services.[44] Further, in addition to historical, political and structural factors, Aboriginal peoples have financial, geographic and personal barriers to overcome in accessing care.[45] In an attempt to address these issues, the concept of cultural safety was developed.[45]

Cultural safety was conceptualized in the 1980s by the Maori peoples of New Zealand as a result of their discontent with existing health services.[46] Cultural safety is an evolving concept, and is more easily defined by what is considered unsafe. Programs or activities that degrade, disempower or debase the cultural identity and well-being of peoples are considered unsafe.[47]Therefore, promising practices in healthcare are programs or activities that incorporate cognitive awareness of existing power imbalances and recognize how these in turn adversely affect the health and well-being of the individuals.[47]

***Difference between Cultural Safety and Cultural Competence/Sensitivity***

The terms cultural safety and cultural competence are, at times, used synonymously; however, a clear distinction between these two concepts has been articulated. Cultural competence or cultural proficiency are terms often used in North America and exist on a continuum that allows an individual to move from a state of cultural incompetence to one of proficiency.[46] Cultural competence relates to the ability to work proficiently with peoples from different ethnic and cultural backgrounds. In this case, proficiency is measured by the caregiver's ability to be familiar with the culture, language, and behaviours of peoples/communities they are providing service to, and through this make suitable recommendations of care.[47, 48] Cultural competence can be achieved in three stages: developing awareness, acquiring knowledge, and maintaining cultural skills.[47, 48]

In the first and second stage, awareness and knowledge are developed by engaging in reflexive practices that includes the identification, recognition, and deconstruction of one's existing biases towards diverse groups. This process is meant to open the individual to the value of diversity and through this be open to other ways of knowing.[47, 48] In the final stage, these skills are maintained through continuous education, formal and informal networking, and actual experience.[47, 48]

A critical difference between cultural competence and cultural safety lies in the fact that the former was developed by, and is therefore reflective of, Western values, whereas cultural safety was developed by Indigenous peoples, the Maori, and is therefore more culturally congruent with their needs and values.[47] For instance, in practice, cultural competence marks the beginning of the learning process and cultural safety marks the end point of this learning.[47]

In cultural sensitivity, the experience of the consumer is of paramount importance.[46] A healthcare provider who practices culturally safe care is one in which the patient or service consumer defines the care.[46] In contrast to cultural competence, which is more aligned with multicultural societies, a key element of cultural safety practice is the

establishment of trust with the patients for culturally safe care.[45] In culturally sensitive terms, this practice is referred to as empowerment practice.[45] Empowerment is said to foster open and egalitarian communication that takes into account the knowledge base of both the service provider and user, resulting in a positive experience that is based on meaningful participation of Aboriginal peoples in the decision-making process of their care.[45] This is significant because the literature notes that Indigenous peoples are not opposed to the western medical care model, but rather invite the Western model to incorporate elements of the Indigenous mode of care in order to make programs, activities and overall healthcare more relevant to the needs of Aboriginal peoples.[45] This process reflects a bicultural framework that fuses key elements of both Western and Aboriginal models in order to develop a process of promising practice for both the service provider and user.[45, 47]

**Characterization of Best or Promising Practice**

The primary goal of this review was to identify promising practices to improve the health of Aboriginal women, newborns, and children. Best practice is a concept that has been used in business, health care, and other industries to identify the "best" way to conduct business or in the case of healthcare, the "best" way to provide care.[49] Sometimes assertions of best practice are made without an accompanying definition of the term or a description of how the conclusion was reached. In other circumstances, best practices are derived from the best available evidence based on research design or currently held expert opinion; clinical practice guidelines are an example. Recently, the Canadian Best Practices Initiative for Health Promotion and Chronic Disease Prevention identified that the challenge of defining best practices is the lack of agreement on what constitutes best practice and which sources of evidence are appropriate for guiding practice.[50]

What qualifies as evidence has been debated in recent years particularly when it concerns service delivery to support health and well-being.[51] Evidence can potentially be generated from multiple sources ranging from personal experience or opinion to controlled experiments or scientific enquiry such as randomized controlled trials. The latter is often referred to as the highest form of evidence.[52] However, not all programs or activities have been subjected to a randomized controlled trial prior to adoption. It is recognized that other research designs such as observational, quasi-experimental and surveillance data are needed to evaluate effectiveness of public and population health initiatives.[53] In many circumstances it is impractical and in some circumstances even thought to be unethical to use randomized control trials.[49] Traditional systematic reviews that define evidence based solely on randomized controlled trials limit the value and potential practical application of programs that have promise but have not been tested in clinical trial experiments. Waiting for clinical trial evidence, particularly for population health or community interventions, may be impractical and costly.

This broader perspective of the use of evidence to guide practitioners and policy makers alike formed the basis of our approach to describing promising practices. It takes into consideration a wide range of study designs, including program evaluations as well as an examination of the context in which the programs or activities took place, from an Aboriginal perspective. Thus, moving beyond scientific rigour and effectiveness and

keeping in line with the concepts of cultural safety, we developed a method to assess programs and activities for cultural sensitivity and cultural alignment, attempting to examine practices from an Aboriginal perspective. More details on this approach are found in the methods section of this report.

The final decision, however, of whether a program or activity is considered a promising practice will depend on those considering its adoption. They must answer the question of what might work in their own contexts considering their populations' characteristics and settings, as well as the potential for uptake and adoption in their situation.[50] This report provides information that can be used by program planners and policy makers. Descriptions of what has been tried and what seems to have worked in terms of process and/or outcomes across different contexts and Aboriginal populations are summarized. In addition, informed consideration of adoption or adaptation of promising practices is possible given the level of detail that is provided regarding the individual programs, or activities described in this report.

## Research Questions

In regions where there are populations of individuals with Aboriginal descent, what programs or activities exist that support maternal, reproductive, newborn, and child health and well-being?

Specifically:

- What gaps are identified in programs, activities, settings, or populations?
- What programs and activities are associated with positive health/well-being outcomes?
- What programs and activities are associated with cultural alignment and sensitivity guidelines?
- What programs and activities represent promising practice (combination of scientific rigour, effectiveness, and cultural alignment/sensitivity)?

## Methods

### Overview

This study used a synthesis approach to identify existing 'promising practices' that support the maternal, reproductive, newborn and child health and well-being of Aboriginal populations. This review explored programs and activities that related to both medical and socio-cultural determinants of health and well-being. The specific focus was on programs and/or activities with actionable and evaluative components. Peer-reviewed literature was systematically searched, screened for relevance, and critically appraised to identify promising practices for supporting maternal reproductive, newborn, and child health in Aboriginal populations (First Nations, Inuit, and Métis peoples).

The appraisal process involved the development and use of ranking systems that allowed reviewers to consistently and objectively identify programs/activities and research of relevance. Articles were appraised for scientific rigour (scientific appraisal) as well as cultural sensitivity and alignment (cultural appraisal).

### Investigative Team and Expert Consultation

The investigative team coordinated the project, including the recruitment, training, and supervision of the research staff. The Aboriginal Advisory Committee of The Alberta Centre for Child, Family, and Community Research provided insight on the cultural sensitivity and alignment appraisal approaches.

In order to identify emerging issues in the area of maternal, reproductive, newborn, and child health, key informants (researchers and community experts) were identified primarily through the articles evaluated in this report (Appendix A). These individuals were contacted electronically and requested to provide their insights into new issues that they were seeing in their work.

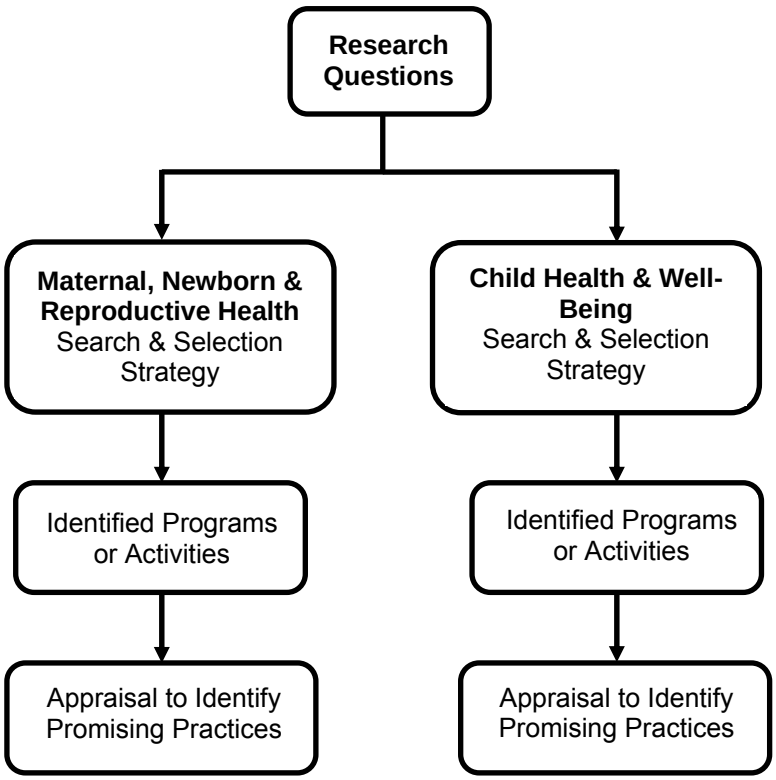
Reviewers were trained in the selection of appropriate studies for inclusion and the use of cultural sensitivity, alignment, and scientific rigour tools for appraisal of research articles. Practice articles were appraised and reviewed with the investigative team for accuracy. Discrepancies were defined as a difference resulting in the articles being ranked in two different categories (e.g. low and medium) or disagreements regarding the inclusion of an article. All discrepancies were discussed with the primary and secondary reviewers, and were resolved with a third and independent moderator.

### Search Strategy

To ensure that all relevant programs and/or activities were identified, two separate searches were performed: one to identify studies addressing maternal, reproductive, and newborn health and a second distinct search to identify studies addressing child health and well-being. The articles identified from each search were screened and selected independently by two trained research assistants. The selected studies from each search were then reviewed using the same appraisal strategy and the results were presented separately for each topic area, that is, for maternal, reproductive, and

newborn health and for child health and well-being (Figure 2). The search strategy was replicated from the 2006 Aboriginal Children's Health Research Agenda Report.[54] In addition to identifying articles through a search of the traditional library databases, additional articles were identified by reviewing the references cited in papers that met the inclusion criteria, as well as from other key articles that identified but did not review or evaluate best practices. These articles were used to identify programs and activities that may not have met the inclusion criteria for years searched, but had been heralded by others as relevant and promising practices.

**Figure 2.** Study strategy to identify promising practices or activities




### *Maternal, Reproductive, and Newborn Health*

Medline, PsycINFO, CINAHL, HealthStar, and Native Health databases were searched. In addition, the ERIC-I, ERIC-II, Gender Studies, Psychology and Behavioural Sciences, and Health Source-Nursing databases were also searched. All databases were searched with three constructs: ethnicity (keywords: Aborigines, Aboriginal, First Nations, Inuit, Métis, American Indian, Alaska Native, Torres Strait Islander, Maori, Indian, Eskimo, Indigenous, Native American), reproduction (keywords: pregnancy, prenatal, maternal, maternity, preconception), and origin of research (keywords: Canada, United States, Australia, and New Zealand). Each search construct was independently searched within each database and then results were combined to obtain the primary list of articles. The search was limited to articles that were published between 2005 and March 2009, inclusive.

### *Child Health and Well-being*

Medline, PsycINFO, CINAHL, HealthStar, Native Health, ERIC I, ERIC II, HealthSource-Nursing, and Child Abuse, Child Welfare, and Adoption databases were searched using search constructs. Search constructs included: ethnicity (keywords: Aborigines, Aboriginal, First Nations, Inuit, Métis, American Indian, Alaska Native, Torres Strait Islander, Maori, Indian, Eskimo, Indigenous, Native American), children (keywords: newborn, infant, child, children, youth), and origin of research (keywords: Canada, United States, Australia, and New Zealand). Each search construct was independently searched within each database and then results were combined to obtain the primary list of articles. The search was limited to articles that were published between 2005 and March 2009, inclusive.

## Selection and Inclusion Strategies

The same selection strategy was implemented for maternal, reproductive, and newborn health as well as child health and well-being to identify articles for inclusion in the synthesis. A tiered selection strategy was implemented that focused on selection of articles reporting on programs or activities based initially on their title, then abstract, then full text. To support this process, identifiable and objective inclusion and exclusion criteria were developed (Table 1). At each tier, two reviewers blinded to each other's selection recommendations carried out selection.

### *Selection Strategy: Titles*

Articles titles were scanned for relevance to promising practices and changes in health outcomes within Aboriginal populations. Article titles that indicated a program, activity, intervention, service, practice, or risk factor were included. Titles that included terms that may lead to 'action' or changes in practice were also included (e.g. immunization). Any title that was considered potentially relevant by either reviewer was included in the subsequent review for further consideration.

### *Selection Strategy: Abstracts*

Abstracts were obtained for all potentially relevant articles, based on the title scan, and further reviewed for relevance based on the same criteria as the title selection strategy. Two reviewers scanned each title and abstract. Any abstract that was considered potentially relevant by either reviewer was included in the subsequent review for further consideration.

### *Inclusion Strategy: Full Text*

All articles that were considered relevant by either reviewer were included for review at the full text review phase. Articles that related to a program, activity, intervention, service, policy or contained another actionable component, contained substantial representation of individuals of Aboriginal descent, and included a majority of respondents that were less than 18 years of age for child health and well-being programs and activities were included. Conversely, articles that referred to case reports, position papers, anecdotal evidence, or literature reviews were excluded. Further, articles that were program reports associated with marketing materials or products were

excluded. Detailed descriptions of the inclusion and exclusion criteria used in this review are provided in Table 1.

**Table 1.** Inclusion and exclusion criteria for the selection of articles to appraise.

| | |
|---|---|
| **Inclusion Criteria** | • If the title, abstract, or manuscript identified a program, activity, intervention, service, policy, or practice.<br>• Articles identifying an actionable component (i.e. immunization).<br>• Heritage: The study contained substantial (enough to allow population specific analysis and findings) representation from indigenous and Aboriginal (First Nations, Inuit, or Métis) populations.<br>• Studies published between January 1, 2005-March 31, 2009, inclusive.<br>• Age: A majority of respondents were under 18 years of age (child strategy only)<br>• Reporting on work conducted in Canada, United States, Australia, or New Zealand. |
| **Exclusion Criteria** | • Publications released prior to January 1, 2005*.<br>• Descriptive studies identifying health disparities or poor health outcomes (as these are not actionable).<br>• Case reports, position papers, literature reviews, or anecdotal evidence.<br>• Program reports associated with marketing materials/products.<br>• Age: The majority of respondents were over 18 years of age (child strategy only).<br>• Foreign language reports.<br>• Programs/activities with no indicators of either outcome or process. |

***** Some programs/activities published earlier than 2005 were included for review based on the hand search of other included program reports or pertinent literature as described.

## Data Management and Extraction

A database was developed to detail search and selection results, to capture necessary details, and to allow for consistent appraisal and scoring of each article. Information extracted from the articles included program name and description, population, final sample size, study design, topic areas, key findings, contributors to health, program description, age grouping, outcomes, as well as appraisal results for scientific rigour and cultural sensitivity and alignment.

## Critical Appraisal

Included articles were appraised for both scientific rigour (quantitative and qualitative scientific appraisal) and for cultural sensitivity and alignment (cultural appraisal) using appraisal tools that were designed for this review. Articles were categorized as ‘high’, ‘mid’, or ‘low’ for scientific rigour and cultural sensitivity and alignment, where a ‘high’, ‘mid’ or ‘low’ rank indicated if the score was in the upper, middle, and lower tertile of the total score possible. All included articles underwent two scientific appraisals and a single cultural appraisal by reviewers who were blind to each other’s scores.

### *Scientific Appraisal*

Scientific rigour was assessed from both quantitative and qualitative perspectives. Quantitative studies were scored based on three main categories: selection bias, information bias, and confounding (Appendix B). The scientific appraisal tool used was developed by Flynn et al,[49] based on the Oxford Centre for Evidence Based Medicine,[55]

and the work of Zara *et al.*[56] Articles were scored on a total of 18 items. Eight items related to the identification of selection bias and aimed to identify potential distortions of the data related to the recruitment, selection, and participation of individuals in the study. Seven items related to the identification of information bias and aimed to identify potential distortions related to the measurement of outcomes or other variables. Finally, three items related to the identification of confounding and aimed to identify potential distortions of the findings as a result of extraneous, but related, factors. Studies were then categorized as 'Low', 'Medium', or 'High'. 'Low' ranged from 0 to 5, 'Medium' ranged from 6 to 11 and 'High' ranged from 12 to18.

Quantitative study designs were also categorized by study design. Level I included experimental study designs (randomized controlled trials with concealed allocation). Level II included quasi-experimental designs, that is, an experimental design without randomization and/or blinding. Level III included both cohort and case control studies as controlled observational studies. Level IV described any observational study, without control groups.

The qualitative appraisal tool used was developed by Flynn *et al*[49] and included 14 items in three categories: reflexivity, credibility, and transferability (Appendix C). Two items related to the evaluation of reflexivity or the researcher's influence on the study's motives, plan and results. A majority of the items, 11 in total, evaluated credibility, including theoretical framework and approaches to data collection and analysis. A final item related to evaluating transferability of the work to other populations and contexts. Studies were categorized as 'Low', 'Medium' and or 'Low' ranged from 0 to 4, 'Medium' ranged from 5 to 9 and 'High' ranged from 10 to14.

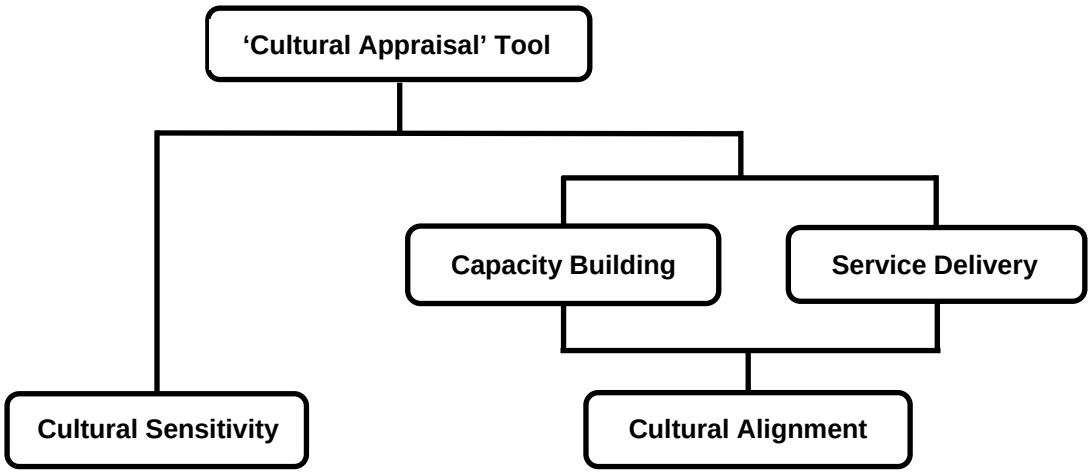
### *Cultural Appraisal*

All articles were assessed for cultural sensitivity and alignment by a single reviewer using a tool developed for this study (Appendix D). This tool to evaluate cultural alignment and sensitivity was adapted from the Society of Obstetrics and Gynaecologists of Canada's guidelines for working with Aboriginals.[57] The details were modified to fit a research context. Input regarding the assessment tool was received from the Aboriginal Advisory Committee at the Alberta Centre for Child, Family, and Community Research.

The tool consisted of 22 items in three categories: cultural sensitivity, service delivery, and capacity building (Figure 3). 'Cultural sensitivity' focused on understanding of Aboriginal culture, history, and context and reviewed whether the study or publication addressed recognition of medical and other determinants of health, the impact of colonization, as well as the availability of cultural training for program staff and included nine factors for consideration. 'Service delivery' and 'capacity building' focused on cultural alignment which to some extent captured cultural safety. Six factors related to evaluation of service delivery including language preferences. Seven factors related to efforts to build local capacity and included items that focused on whether the program/activity and research was community based. While it was recognized that some of this information is not typically included in a research paper, the Aboriginal

Advisory Committee felt that it was important to recognize these factors and identify gaps needing to be addressed in future program planning and research. Each study, was categorized as 'Low', 'Medium', or 'High' based on the number of factors that were identified from the publication. 'Low' ranged from 0 to 7, 'Medium' ranged from 8 to 14 and 'High' ranged from 15 to 21.

**Figure 3.** Cultural appraisal tool used to measure cultural sensitivity and alignment.




## Synthesis of Findings

Studies were examined on all appraisal parameters and by setting (rural or urban) and country. Given the diversity of articles and review criteria, quantitative and qualitative studies were analyzed separately and comparisons were made within each category. Relationships between scientific rigour and cultural sensitivity and alignment were also examined.

Studies were grouped using the holistic model (Figure 1) to examine what health determinants and contributors to health were targeted by the program or service and what mechanisms to address health related issues were used. Each study was reviewed individually for its appraisal results and outcomes. Limitations in study design were noted. Programs and activities were also grouped by topic. 'Maternal Topics' were based on stages of pregnancy from preconception to postpartum. 'Child Topics' were based on child health and well-being including oral health, mental health, immunization, health promotion, education, and diagnostic accuracy.

## Identification of Promising Practices

Using the framework, titled the *Promise Table*[58], programs/activities based on their evaluation or research reports were categorized from least to most promising using a matrix that judged (1) the certainty of effectiveness as high, medium or low based on the *quality of evidence and outcomes* and (2) the potential for population impact as high, moderate, or low based on *program logic, reach* and *uptake*.[58] Identification of *program logic* took into account the reporting of the use of frameworks and/or evidence

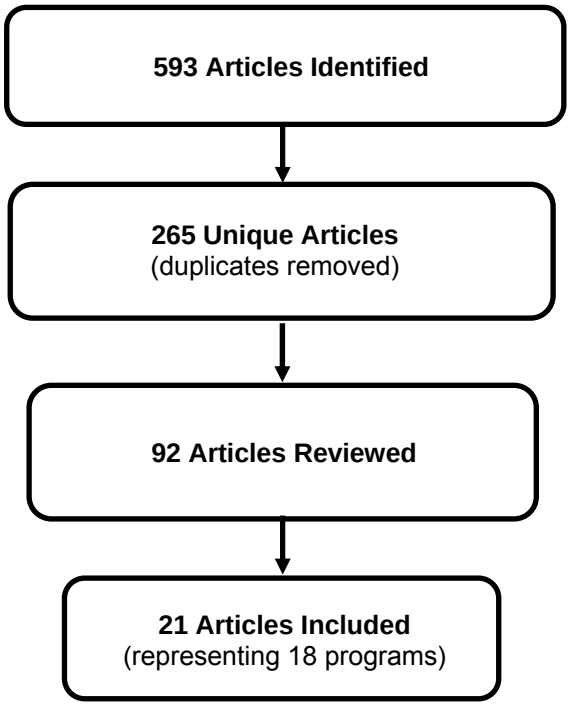
in the development of programs or activities; *reach* took into account the range and breadth of participation; and *uptake* took into account evidence of sustainability of the programs or activities For the purposes of this review, cultural alignment and sensitivity was included as a component of potential for impact on Aboriginal populations. The parameters chosen were included to bring a population health perspective to the work recognizing the urgent need to move beyond a singular focus on individuals and move toward addressing the health of whole populations.[48] This framework has been proposed as useful when considering adoption of programs.[58, 59] The investigators collaborated together, using a primarily qualitative approach, to assign each included program a ranking from least to most promising (Appendix E).

## Results: Maternal, Reproductive, & Newborn Health

### Search Strategy Results:

Using the above search strategy, a total of 593 articles were identified, 265 of which were original research articles (Figure 4). A total of 92 were included for full review and further assessment. One article was selected for appraisal but did not arrive in time for further assessment. A total of 21 articles representing 18 programs or activities were included in the promising practices review for maternal, reproductive, and newborn health (Appendix F). A total of 71 studies were excluded from the promising practices review (Appendix G).

**Figure 4.** Algorithm of overall synthesis strategy for maternal, reproductive, and newborn health.




### Descriptive Data: Programs and Activities

Among the 18 included studies where programs and activities were discussed, five used qualitative methods,[2, 16, 60-62] ten used quantitative methods,[14, 18, 63-70] and three used both quantitative and qualitative (mixed) study methods.[3, 12, 71] This resulted in eight qualitative scores (five from purely qualitative studies plus three from qualitative components of mixed method studies) and 13 quantitative scores (10 from purely quantitative studies plus three from quantitative components of mixed method studies).

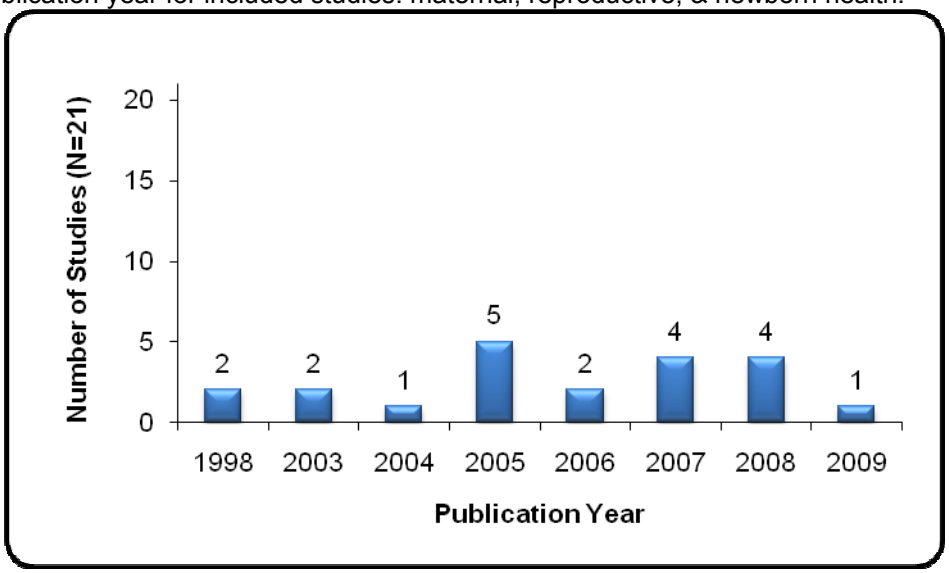
In brief, two qualitative studies ranked 'high' for scientific rigour,[2, 71] whereas no quantitative studies were appraised 'high'. Further, among all qualitative and quantitative appraisals, 13 had a 'mid' ranking[3, 12, 14, 16, 61-65, 67, 68, 71] for scientific rigour.

The cultural appraisal resulted in a total of 18 scores, 3 had a 'high' ranking,[2, 3, 16] 11 were within the 'mid' ranking,[12, 15, 18, 60-62, 65, 66, 69-71] and 4 were 'low'.[63, 64, 67, 68] In total, more than half (n=14) of the appraised studies scored 'mid' to 'high' for cultural appraisal, indicating substantive cultural sensitivity and/or alignment.

### *Year*

Given that publications were only initially included if they were dated 2005 to 2009, 76% (n=16) of studies in this report were published in 2005 or later. More specifically, five studies were published in 2005,[14, 63, 64, 67, 68] two in 2006,[62, 66] four in 2007,[15, 17, 18, 65] four in 2008,[16, 60, 61, 71] and one by March of 2009.[2] Additionally, five studies were included as a result of 'hand searching' reference lists of other included articles published prior to 2005 (two each in 1998[12, 13] and 2003,[69, 70] and one in 2004;[3] see Methods; Figure 5).

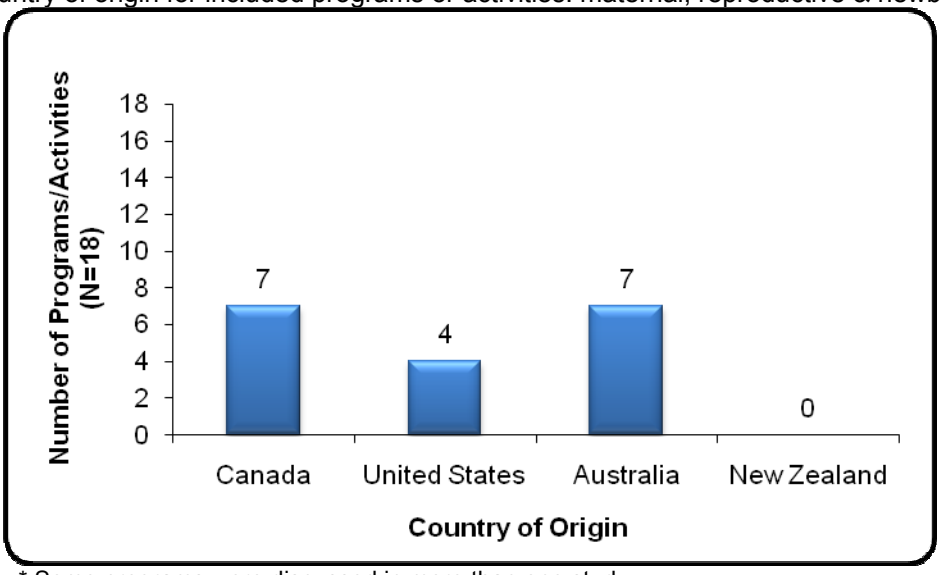
**Figure 5.** Publication year for included studies: maternal, reproductive, & newborn health.




### *Country of Origin*

Seven of the 18 included programs or activities were each conducted in Canada[2, 12, 13, 62, 63, 66, 69, 71] and Australia,[3, 14-17, 61, 65, 67, 70] followed by the United States with four studies*.[18, 60, 64, 68] No included studies were conducted in New Zealand (Figure 6).

**Figure 6.** Country of origin for included programs or activities: maternal, reproductive & newborn health.




* Some programs were discussed in more than one study

### *Setting*

While two studies did not specify a setting,[18, 69] among those that did, less than half (n=7) took place in both urban and rural locations,[15, 62-65, 67, 71] while four were located in urban-only settings[3, 60, 61, 66] and five were located in rural-only settings.[2, 12, 16, 68, 70]

### *Topics*

Of the 18 studies included in the review, eight topic areas pertaining to maternal, reproductive, and newborn health were identified (Table 2). The program topic areas fall into three general time periods: preconception, prenatal care and labour and delivery, and postpartum care. Of note, two studies addressed multiple topics; program topic areas are not mutually exclusive.

**Table 2.** Studies relating to each stage of reproductive health.

| Program Topic Area | Number of Studies (N=18)* |
|---|---|
| **Preconception** | **2** |
| **Prenatal Care, Labour & Delivery** | **17** |
| Culturally Sensitive Care | 9 |
| Mental Health | 1 |
| Alcohol, Tobacco, other Drug Use | 3 |
| HIV | 2 |
| Labour and Delivery | 2 |
| **Postpartum Care** | **1** |

*Studies may be included in more than one topic area

## Scientific Rigour

### *Qualitative Studies*

Qualitative appraisals were completed on eight studies: five exclusively qualitative studies [2, 16, 60-62] and the qualitative portions of three mixed methods [3, 12, 71] studies. A case study method was used in one study, incorporating multiple qualitative data sources to describe the case in the real life context and to access the thoughts and motivations of participants.[2] A participatory action framework, which lends itself to incorporating cultural safety in the development and evaluation of programs, activities, services, or interventions was used in one study.[62] Two studies conducted participatory research involving community members to participate in study design and data analysis. One of these studies used mixed methods[71] while the other was solely qualitative in nature.[61] Simple content analysis primarily to examine satisfaction, adherence to program parameters, or to identify barriers and facilitators was used in three studies.[3, 12, 71] In the remaining two studies[2, 62] investigators went beyond simple content analysis in their approach but did not clearly specify the qualitative analysis technique used.

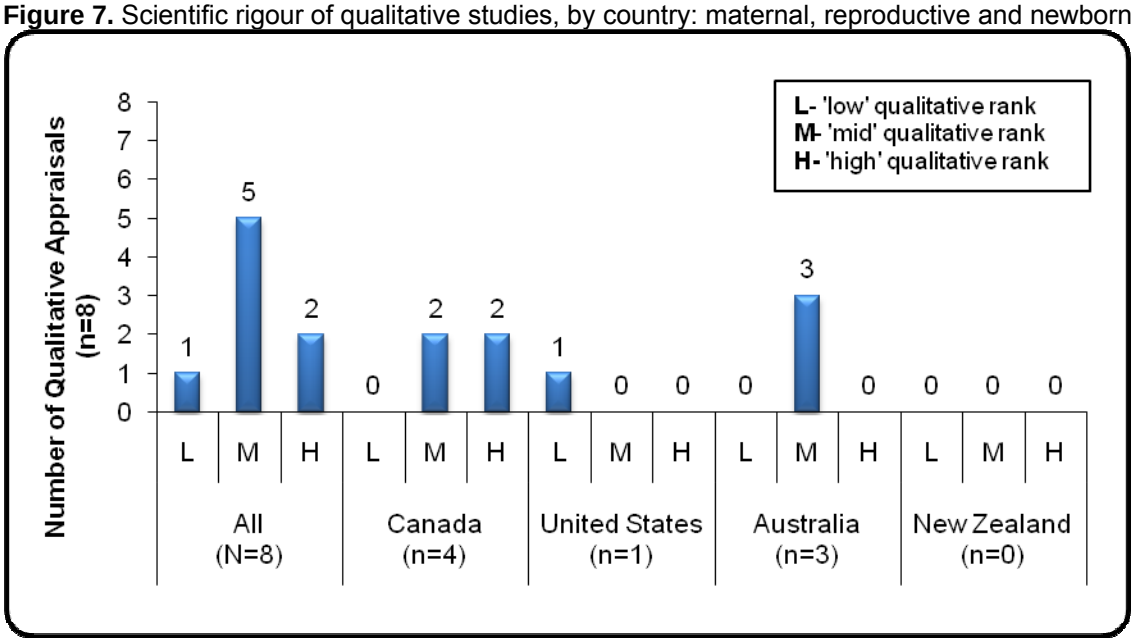
Five qualitative studies had a 'mid' ranking[3, 12, 16, 61, 62] for scientific rigour and two studies had a 'high' ranking[2, 71] while one ranked 'low'[60] (Table 3).

**Table 3.** Number of studies in each level of qualitative scientific rigour: maternal, reproductive & newborn health.

| | Level of Qualitative Scientific Rigour | | |
|---|---|---|---|
| | 'Low' n | 'Mid' n | 'High' n |
| **Number of Qualitative Appraisals (n=8)** | 1 | 5 | 2 |

One study from Canada[62] and three from Australia[3, 16, 61] had a 'mid' ranking for qualitative scientific rigour, while two studies from Canada[2, 71] scored within the 'high' ranking (Figure 7).

**Figure 7.** Scientific rigour of qualitative studies, by country: maternal, reproductive and newborn health.




### *Qualitative Scientific Rigour Components: Reflexivity, Credibility, and Transferability*

All studies using qualitative methods alone or in part were appraised for three components of qualitative scientific rigour: reflexivity, credibility (theoretical framework, sampling, data collection, analysis approach), and transferability.

Information on the investigator's background or perspectives was provided in one study.[16] Only one group of authors[62] provided information regarding their personal influence on their research indicating little reflexivity among this group of studies.

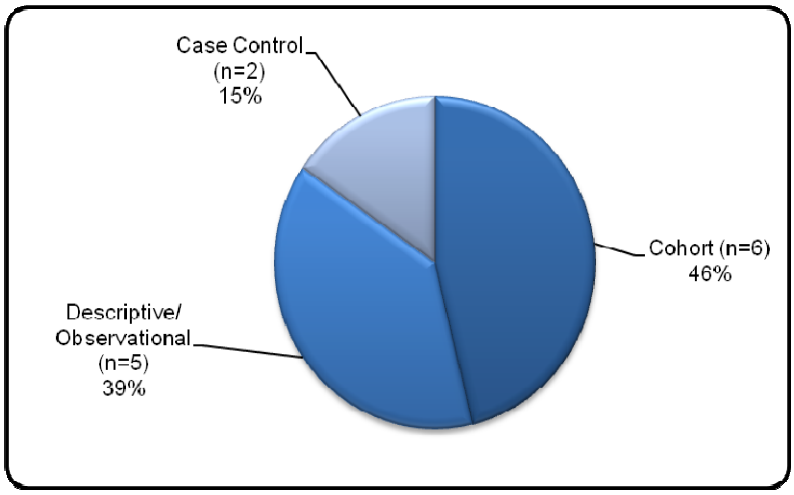
In half (n=4) of all qualitative studies appraised, the theoretical framework adopted was described and considered adequate given the aims of the study.[2, 16, 62, 71] The authors' role in interpreting their data was described in five studies.[2, 16, 61, 62, 71] Biases in selection were reported in fewer than half (n=2)[2, 71] of qualitative studies. However sampling approaches were clear and demonstrated consistency between sampling and study aims in five studies.[2, 3, 12, 16, 71] Theoretical justification for sample selection was reported in half of the studies.[2, 3, 16, 17, 71] Data limitations were described in half of all studies (n=4) and activities relating to data collection were clearly described in six studies .[2, 3, 12, 16, 62, 71] Transparent and systematic analysis approaches were described in four[2, 3, 61, 71] of the eight qualitative studies. Analysis approaches were considered consistent with qualitative tradition and aims in five studies ,[2, 12, 61, 62, 71] and trustworthiness of study data was verified such that the authors' interpretation emerged from data nearly all studies (n=7).[2, 3, 12, 16, 61, 62, 71] There was inconsistency in describing elements of credibility by the investigators of the studies included in this review.

Enough of a description of sample characteristics to provide a context for identifying the potential for transferability of the research to other populations was provided in six[2, 3, 16, 61, 62, 71] of the eight studies.

### *Quantitative Studies*

Quantitative scientific appraisals were completed on 13 included studies, which involved appraising ten exclusively quantitative studies[15, 18, 63-70] and the quantitative portions of three mixed methods studies[3, 12, 71] (i.e., studies that used both quantitative and qualitative methods). Of the 13 appraisals, six were classified as having a cohort study design[3, 12, 15, 65, 68, 70] and five were classified as descriptive/observational[18, 66, 67, 69, 71], which included studies with a pre-post design and/or studies with no control group. Two studies were classified as having a case-control design[63, 64]. Of note, there were no identified studies with a quasi-experimental or randomized control trial design (Figure 8).

**Figure 8.** Type of quantitative study design: maternal, reproductive & newborn health.



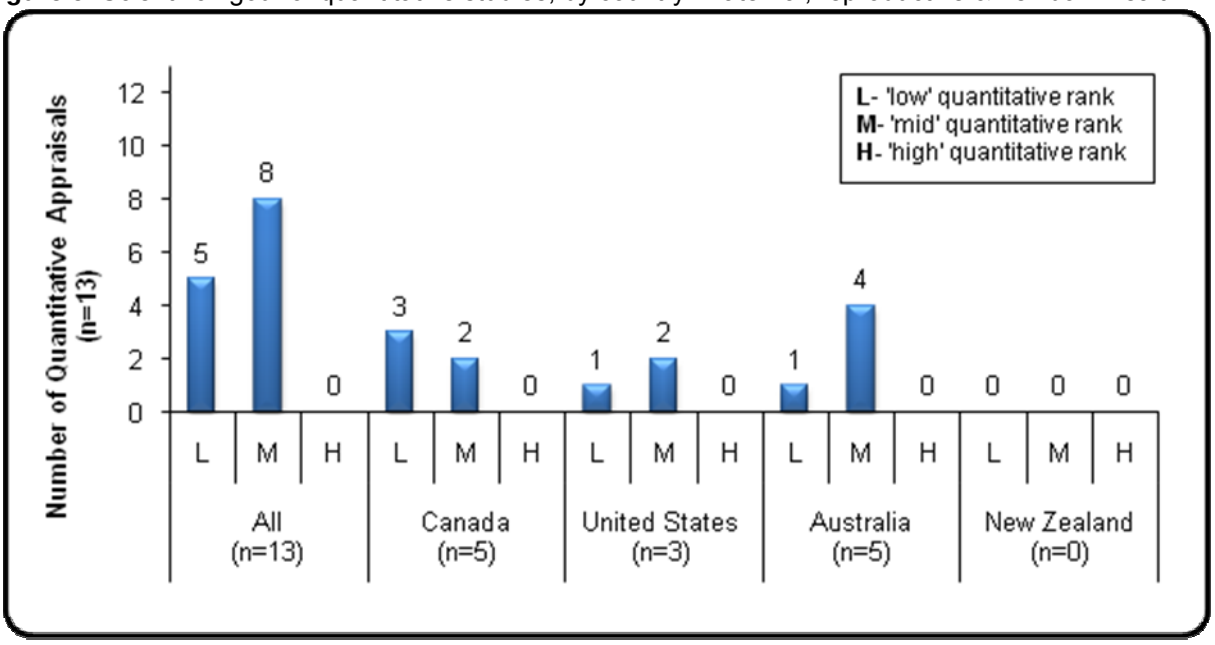

All quantitative appraisals (n=13) were assigned as having either a 'low', 'mid', or 'high' ranking for scientific rigour. All articles that reported quantitative data had either 'low' (n= 5) or 'mid' (n=8) for scientific rigour; (Table 4). These findings need to be considered when determining promising practice recommendations as all of the studies would be eliminated if a 'high' ranking for scientific rigour was the only criteria used to define best practice.

**Table 4.** Number of studies in each level of quantitative scientific rigour: maternal, reproductive, newborn health.

| | Level of Quantitative Scientific Rigour | | |
|---|---|---|---|
| | 'Low' n | 'Mid' n | 'High' n |
| **Number of Quantitative Appraisals (n=13)** | 5 | 8 | 0 |

Two studies each originating in Canada[63, 71] and the United States[64, 68] had 'mid' level of scientific rigour, while four studies from Australia[3, 15, 65, 67] were also 'mid' level (Figure 9).

**Figure 9.** Scientific rigour of quantitative studies, by country: maternal, reproductive & newborn health.




### *Quantitative Scientific Rigour Components: Selection Bias, Information Bias, and Confounding*

All exclusively quantitative studies (n=10) and the three quantitative portions of mixed methods studies were appraised for selection bias, information bias, and confounding. Results of these individual measures are described below.

Nearly all quantitative studies (n=12) were population based[3, 12, 15, 18, 63-65, 67-71] and 11 had identified eligibility criteria.[3, 15, 63-71] No studies included samples that were randomly selected or identified reasons for loss to follow up as being the same for all groups. Dropout rates and reasons were reported one study[67] and among all 13 quantitative appraisals, only three[15, 65, 69] had a follow up rate of greater than 80%.

Sample groups were assessed in the same manner in nearly all studies (n=10)[3, 15, 18, 63-66, 68, 70, 71] and all but one had outcome assessments that were valid and reliable.[3, 14, 15, 18, 63-71] In just over 50% of studies (n=8),[3, 18, 63-65, 67, 68, 71] prognostic and exposure baseline assessments were identified as valid and reliable. No studies included any form of blinding, including for outcomes assessors.

Study sample groups had similar prognostic factors at baseline assessment in six quantitative studies[3, 15, 63, 64, 68, 71] and groups were comparable on prognostic/confounding factors in only two studies.[3, 68] Finally, in just over half (n=7)[15, 63-68] of studies, confounding factors were taken into consideration in their analyses.

### *Cultural Appraisal of Programs and Activities*

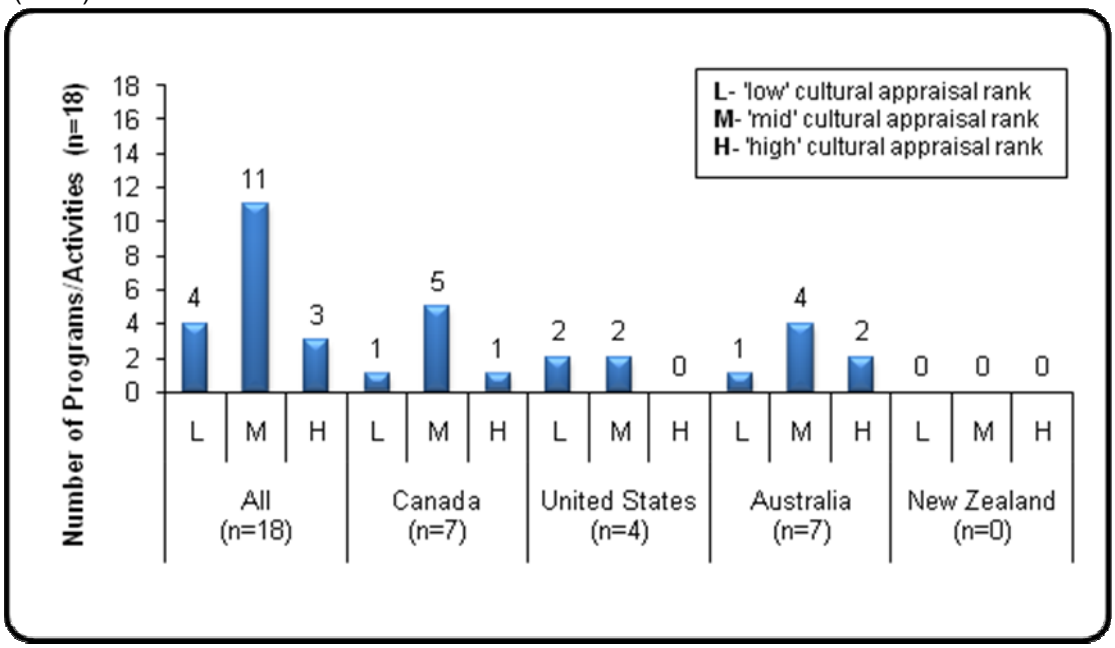
All included studies' programs and activities were appraised for cultural alignment and sensitivity. The appraisal assessed three components of cultural alignment and sensitivity: cultural sensitivity, service delivery, and capacity building. Four studies scored 'low' , eleven scored 'mid', and three studies' scored 'high' for cultural alignment and sensitivity (Table 5). Of note, these three 'high' ranking studies included two qualitative studies[2, 16] and one mixed method study.[3]

**Table 5.** Number of studies in each cultural appraisal ranking: maternal, reproductive & newborn health.

| | Level of Cultural Sensitivity/Alignment | | |
|---|---|---|---|
| | 'Low' n | 'Mid' n | 'High' n |
| **Number of Programs or Activities (n=18)** | 4 | 11 | 3 |

Two of the three studies that ranked 'high' for cultural appraisal were based in Australia[3, 16] and one was based in Canada.[2] Both Australia[3, 14-17, 61, 65, 70] and Canada[2, 12, 13, 62, 66, 69, 71] had six programs or activities each that ranked within the 'mid' to 'high' range for cultural alignment and sensitivity (Figure 10).

**Figure 10.** Ranking for cultural appraisal of all studies, by country: maternal, reproductive & newborn health (n=18).



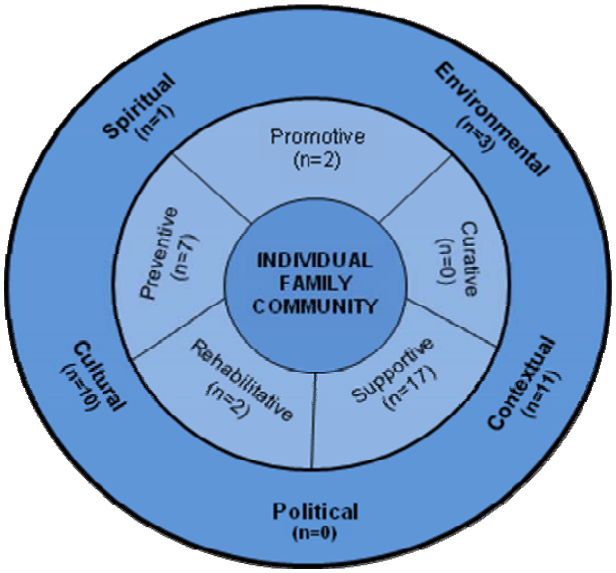
## Describing Practices Using the Holistic Health Model

The Holistic Health Model and (Figure 1) provided a framework in which to better understand health programming from an Aboriginal perspective. As such, the programs and activities were classified into cultural, contextual, environmental, spiritual, and political *contributors* to health. Further, the *mechanisms* to improve health were considered including: preventive, promotive, supportive, curative, and rehabilitative. Classification of contributors to health and mechanisms to improve health were not mutually exclusive.

Many of the studies examined included programs that addressed contextual[12, 13, 18, 61-68, 71] and cultural[2, 3, 12-17, 61, 64, 69, 70] contributors to health. Three programs addressed environmental contributors to health[12, 62, 65] and one program addressed a spiritual contributor to health.[60] Given that many Aboriginals in Canada are located in rural areas, there may be an opportunity to address more environmental contributors to health that are associated with rural lifestyles. Further, no programs addressed political contributors to health, which may suggest a lack of programs addressing these factors or a lack of peer-reviewed research or evaluation.

It is promising to note that a majority of programs and activities (n=17) used supportive mechanisms[2, 3, 12, 14, 16-18, 60-63, 65-67, 69-71] based on the Holistic Health Model. This is aligned both with community driven theories of health promotion, and also with reports from Aboriginal populations that 'supportive' mechanisms are preferable.[72, 73] Aligned with supportive mechanisms, seven programs[18, 61-65, 68] also used a preventive mechanism to improve health. Two programs each used promotive[12, 63] and rehabilitative[18, 61] mechanisms respectively while none used curative mechanisms (Figure 11).

**Figure 11.** Number of programs or activities addressing contributors to health based on the Holistic Health Model.



## Promising Practices for Maternal, Reproductive, & Newborn Health

Programs in this review for maternal, reproductive, and newborn health ranged from least to most promising based on their certainty of effectiveness and potential for population impact as described in the definition of promising practice (*see* Methods). Table 6 provides a listing of the programs and includes some of the criteria examined to assign a promising rank. Two programs were considered 'very promising',[2, 3] five were considered 'promising',[12, 15, 16, 65, 70] seven were classified as 'less promising',[18, 61, 62, 64, 66, 68, 71] and four were considered 'least promising[60, 63, 67, 69] from a population health perspective.

One very promising program was a midwifery education program for Aboriginal students[2] that scored high in both qualitative scientific rigour and cultural appraisal, and was a well constructed program with a strong qualitative design for a process evaluation. The program provides an exemplary approach to building capacity in Aboriginal communities. Although reach was not extensive, program logic was apparent. This program can serve as an example to other provinces and territories to enhance their ability to provide both clinically and culturally safe care.

The other very promising program also related to midwifery practice and included an economic evaluation of a community controlled midwifery program in Australia.[3] The program serves a population of 12,000 women and has a full time Aboriginal health worker. In addition to demonstrated cost efficiency, women participating in the program received earlier and more frequent prenatal care compared to women receiving standard care. Birth outcomes were not different. The qualitative component of the study identified strong valuing of the program by participants.

An HIV testing and care preconception study, although high in qualitative scientific rigour and mid on cultural appraisal, was less promising due in large part to the lack of described program features.[71] Programs identified under the 'providing culturally sensitive prenatal care' heading contained the most programs and studies with four promising programs[12, 15, 16, 70] in addition to the two very promising programs described above. This indicates that there are numerous examples of programs that could serve as models for providing culturally sensitive prenatal care for pregnant women. There was one promising program that provided nurse coordination for specialist care for HIV positive women and demonstrated a reduction in caesarean delivery.[65] This program could be used as an example for both Aboriginal and non-Aboriginal populations.

**Table 6.** Summary of appraisal scores and program/activity outcomes: maternal, reproductive, & newborn health.

| Promising Practices | Article Title | Cultural Appraisal Rank | Scientific Rigour | | Outcomes<br>+ positive<br>- negative<br>↔ neutral<br>? unknown |
|---|---|---|---|---|---|
| | | | Quantitative Rank | Qualitative Rank | |
| ***Preconception*** | | | | | |
| Less Promising | HIV Testing and Care in Canadian Aboriginal Youth: A community based mixed methods study[71] | Mid | Mid | High | **Process** ? |
| Less Promising | Enhanced Case Management to Prevent Fetal Alcohol Spectrum Disorders in Northern Plains Communities[18]<br>*Also includes Substance Use* | Mid | Low | NA | **1° Outcome** + |
| ***Prenatal: Culturally Sensitive Care*** | | | | | |
| **Very Promising** | Delivering Diversity: Newly Regulated Midwifery Returns to Manitoba, Canada, One Community at A Time[2] | High | NA | High | **Process** + |
| **Very Promising** | An holistic economic evaluation of an Aboriginal community-controlled midwifery programme in Western Sydney[3] | High | Mid | Mid | **Process** +<br>**1° Outcome** + |
| Promising | Aboriginal maternal and infant care workers: partners in caring for Aboriginal mothers and babies[16, 17]<br>*Also includes postpartum care* | High | NA | Mid | **Process** + |
| Promising | Evaluation of a Midwifery Birthing Center in the Canadian North[12, 13] | Mid | Low | Mid | **Process** +<br>**1° Outcome** ? |
| Promising | Sustainable antenatal care services in an urban Indigenous community: the Townsville experience[14, 15] | Mid | Mid | NA | **Process** +<br>**1° Outcome** + |
| Promising | Monitoring the 'strong women, strong babies, strong culture program': the first eight years[70] | Mid | Low | NA | **Process** +<br>**1° Outcome** + |
| Least Promising | Spiritual Support for Native American Indian Patients[60] | Mid | NA | Low | **Process** + |

| Promising Practices | Article Title | Cultural Appraisal Rank | Scientific Rigour | | Outcomes<br>+ positive<br>- negative<br>↔ neutral<br>? unknown |
|---|---|---|---|---|---|
| | | | Quantitative Rank | Qualitative Rank | |
| Least Promising | The outcome of perinatal care in Inukjuak, Nunavik, Canada 1998-2002[69] | Mid | Low | NA | **Process** +<br>**1° Outcome** + |
| Least Promising | Challenges in preventing pyelonephritis in pregnant women in Indigenous communities[67] | Low | Mid | NA | **1° Outcome** - |
| ***Prenatal: Mental Health*** | | | | | |
| Less Promising | Prevalence of Antenatal Depression in Women Enrolled in an Outreach Program in Canada[66] | Mid | Low | NA | **Process** + |
| ***Prenatal: HIV Testing*** | | | | | |
| Promising | Perinatal HIV transmission and pregnancy outcomes in indigenous women in Western Australia[65] | Mid | Mid | NA | **Process** +<br>**1° Outcome** + |
| Least Promising | Potential Factors That May Affect Acceptance of Routine Prenatal HIV Testing[63] | Low | Mid | NA | **Process** ? |
| ***Prenatal: Alcohol Drug and Tobacco Use*** | | | | | |
| Less Promising | Indigenous women and smoking during pregnancy: Knowledge, cultural contexts and barriers to cessation[61] | Mid | NA | Mid | **Process** + |
| Less Promising | Bridging the Research Gap: Aboriginal and academic collaboration in FASD Prevention. The Healthy Communities, Mothers, Babies Project.[62] | Mid | NA | Mid | **Process** + |
| ***Prenatal: Labour and Delivery*** | | | | | |
| Less Promising | Cesarean Delivery in Native American Women: Are Low Rates Explained by Practices Common to the Indian Health Service?[64] | Low | Mid | NA | **1° Outcome** + |
| Less Promising | Active Management of the Third Stage of Labor Among American Indian Women[68] | Low | Mid | NA | **1° Outcome** + |

## Better Understanding the Practices: Maternal, Reproductive, & Newborn Health

### Overview

The following section is presented in three stages that characterize reproductive health: the preconception period, the prenatal period (including labour and delivery), and the postpartum period. The preconception period addresses the health of women of childbearing age prior to pregnancy. The prenatal period spans from conception through to labour and delivery. Postpartum care includes the health of both mother and infant after delivery.

The section provides specific information on the programs and activities included in the review to identify promising practices. However, supplemental material was obtained from the excluded articles to provide an in depth understanding of the state of practice and services research/evaluation for maternal and reproductive health. Additional research not identified by the search, selection, or inclusion process was used to provide demographic or health disparity information in order to identify the context and importance of programs or activities.

The World Health Organization[74] recommends that women of childbearing age receive immunization against tetanus and other applicable vaccinations, manage sexually transmitted and reproductive tract infections, including preventing these infections where possible, and that women receive folate supplementation to support optimal health before pregnancy (preconception). To support prenatal health, it is recommended that women receive iron supplementation, and continue folate supplementation. At least four antenatal visits during the prenatal period that address maternal and fetal health promotion, health assessment, and ongoing identification and treatment of disease are recommended.[74] A skilled attendant to provide ongoing care, with the ability and training to identify and manage pregnancy complications is required during the prenatal period and labour and delivery.[74] Further, the Society of Obstetrics and Gynaecology of Canada recommends that for rural Aboriginal women this individual be a midwife who can seek out additional care as needed.[57] Postpartum care includes health promotion of both mother and infant, including information about immunization, breastfeeding, and family planning.[74] Many of the programs below address some of these important contributors to maternal, reproductive, and newborn health.

### Language of Pregnancy

To understand the intended timing of programs and activities, it is helpful to define the stages of pregnancy and understand the scientific language surrounding the stages of pregnancy. A list of key terms is provided below to support a better understanding of when programs and activities are being offered (Table 7)

**Table 7.** Terms and definitions for stages of pregnancy.

| Term | Definition |
|---|---|
| Preconception | Prior to pregnancy for women of childbearing age |
| Pregnancy | From conception to birth |
| Prenatal | Conception to before birth |
| Antenatal | Occurring or existing before birth (comparable to prenatal) |
| Perinatal | Occurring during or pertaining to the phase surrounding the time of birth, from the twentieth week of gestation to the seventh day of newborn life |
| Postpartum | After delivery |

## Summary of Included Programs and Activities

Two programs related to health during the preconception period, 17 related to prenatal health and care, including two that addressed health during labour and delivery, and one addressed health during the postpartum period (Table 8). Of the 18 included programs, two programs addressed health in multiple phases of pregnancy, for example, midwifery programs offer services during the prenatal period, labour and delivery, as well as postpartum. As such, some programs are discussed in multiple places and data relevant to each phase is reported separately.

**Table 8.** Number of programs addressing each stage of pregnancy.

| Stage of Pregnancy | Related Programs (n) |
|---|---|
| **Preconception Care** | **2** |
| Fetal Alcohol Spectrum Disorder | 1 |
| HIV Testing | 1 |
| **Prenatal Care, Labour, & Delivery** | **16** |
| Culturally Sensitive Care | 9 |
| Mental Health | 1 |
| HIV Testing & Transmission | 2 |
| Alcohol, Drug, & Tobacco Use | 2 |
| Labour & Delivery | 2 |
| **Postpartum Care** | **1** |

## Preconception Period

Based on the Aboriginal Holistic Health Model, identified interventions for the preconception period addressed contextual contributors to health. Both the FASD prevention program[62] and the HIV testing services[63] address identifying and modifying the context of addiction and testing. Both programs worked via a supportive mechanism to enhance and improve women's health prior to pregnancy. The FASD prevention program also used a rehabilitative mechanism, in treating addiction, and a preventive mechanism, in reducing the incidence of FASD births.

### *Fetal Alcohol Spectrum Disorders (FASD)*

FASD is caused by prenatal exposure to alcohol and is a preventable birth defect that results in growth restriction and developmental delay.[66, 75, 76] The average incidence of FASD in high risk American Indian communities has been estimated at 9-10 per 1,000 births compared to 0.5-2 in the general US population.[75, 76] Some evidence suggests that the proportion of adults consuming alcohol in these high risk communities is comparable to the general US population, however, there may be increased binge drinking in American Indian communities among women aged 20-34 years.[75, 76] Given

the increased risk of FASD associated diagnoses in Aboriginal communities, there has been a focus on the reduction of alcohol consumption and binge drinking during the preconception period and pregnancy. One such program[18] is described below and although characterized as having low scientific rigour (due to risk for selection bias, lack of control for confounding, and lack of a comparison group) there were attempts to address cultural sensitivity. Additional focus on building community capacity would strengthen the program's cultural alignment.

A team, who received intensive and ongoing training, provided enhanced case management to 131 women who were at risk for alcohol consumption and/or addiction in an effort to reduce alcohol consumption prior to and during pregnancy (Table 9).[18] Women were encouraged to prevent unwanted pregnancies by using birth control or to protect the fetus by refraining from alcohol consumption during pregnancy.[18] During the follow-up period a total of 149 pregnancies occurred and 76% of those pregnancies resulted in normal deliveries with only two children suspected of having severe FASD.[18] The study results were mixed based on the risk status of the women.[18] The proportion of women who were consuming alcohol decreased from baseline to six and 12 months, however, among those who continued to consume alcohol, the number of drinks consumed did not decrease.[18] That is, case management was effective for women who were able to or interested in abstinence from alcohol, but was less effective at promoting moderate alcohol consumption. Further, while there was an initial decrease in the frequency of alcohol or drug consumption (reported as being drunk or high) between baseline and six months, this decrease was not sustained at 12 months post treatment.[18] These results and this program, although less promising, indicate that enhanced case management may be effective among those interested in complete abstinence from alcohol or drug consumption. A stronger research approach is required to provide better evidence for effectiveness.

**Table 9.** Detailed description of the May, P. A., Miller, J. H., Goodhart, K. A., et al. study.[18]

| | |
|---|---|
| **Description** | Case Management (CM) in the context of this study was a community wide service coordination prevention approach including provision of instrumental and psychosocial support as well as providing communication networks and coordinated services. In conjunction with CM, Motivational Interviewing (MI) was used in this program to enhance the effectiveness of CM and affect change. MI is a counselling style that is client-centered, directive, and is used to elicit behaviour change in clients. This is accomplished by helping clients explore and resolve ambivalent behaviours. |
| **Population** | American Indian |
| **Location** | Minnesota, North and South Dakota, Montana, United States, |
| **Study Methods** | Quantitative, Quasi-experimental (e.g. No randomisation) |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 131 women with 149 pregnancies |
| **Key Finding(s)** | **Preconception Care: Fetal Alcohol Spectrum Disorder**<br>Case Management, enhanced with Motivational Interviewing strategies, may be an efficacious intervention strategy for women interested in alcohol abstinence and at high risk for giving birth to children with an FASD. |
| **Contributors** | Contextual |
| **Mechanisms** | Rehabilitative, Supportive, Preventive |

### *HIV Testing in Youth of Childbearing Age*

The incidence of HIV infection among Aboriginal populations in Canada was estimated to be 2.8 times higher than the non-Aboriginal population in 2006.[77] While Aboriginal populations accounted for nearly 25% of HIV cases, they represent only 3.8% of the Canadian population, indicating an overrepresentation of HIV-positive Aboriginal peoples.[11, 39] Given the high rates of teenage pregnancy,[78] ongoing HIV testing is a proposed strategy to support preconception and reproductive health. A better understanding of barriers and facilitators to HIV testing is the first step in developing strategies to increase testing in at risk youth. The following study provides an example of collaboration between the Aboriginal community and researchers to address cultural sensitivity.[71] The CIHR guidelines for Health Research Involving Aboriginal People[79] recommends Aboriginal member involvement in design of the study, interpretation of data, and dissemination of findings. These guidelines were followed in this study.

This recent survey explored youth motivation and willingness to be tested for HIV, and the findings may enhance service providers' understanding of youths' decision to undergo HIV testing (Table 10).[71] Among those who were not tested, the most common reasons included perceived low risk and perceived low risk for partners, that is, the perception that their partners were not infected.[71] Among those who had been tested, the most commonly reported reasons for doing so were unprotected sex (i.e. without a condom) or pregnancy, including suspected pregnancy.[71] There was a delay in seeking care following a positive result of an HIV test. Indeed, of the ten youth that reported being HIV-positive and provided information regarding the duration between testing and treatment, five (50%) waited more than three months to seek care.[71] The survey's qualitative component ranked high in scientific rigour, however the quantitative appraisal was characterized as having mid scientific rigour due to potential for selection and information bias and there was lack of reach. Despite the study being characterized as less promising; the findings suggest there may be an opportunity to include prevention information for those who are being tested and to find creative ways to follow-up with those who test positive for HIV.

**Table 10.** Detailed description of the Mill, J., Jackson, R., Worthington, C., et al study.[71]

| | |
|---|---|
| **Population** | Aboriginal, Métis, First Nations, and Inuit |
| **Location** | Several Canadian urban centres |
| **Study Methods** | Mixed methods |
| **Scientific Appraisal** | Quantitative: Mid; Qualitative: High |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 413 surveys + 28 interviews |
| **Key Finding(s)** | **Preconception Care: HIV Testing in Youth of Childbearing Age**<br>Youths' perceived risk of HIV infection related to sexual activity behaviours was the primary determinant in their willingness for HIV testing. Among youth with HIV, a delay in the time to treatment after testing suggests a need for innovation in follow-up from HIV testing. |
| **Contributors** | Contextual |
| **Mechanisms** | Supportive |

## Prenatal Period, Labour, & Delivery

The prenatal period spans from conception to before birth. A total of 16 identified programs (19 articles) focused on care during the prenatal period. Nine programs (12 articles) addressed provision of culturally sensitive care,[2, 3, 12-17, 60, 67, 69, 70] one program addressed mental health,[66] two addressed HIV testing and transmission,[63, 65] two addressed alcohol, drug, and tobacco use,[61, 62] and two addressed labour and delivery.[64, 68]

Based on the Aboriginal Holistic Health Model, identified interventions for the prenatal period, addressed spiritual (n=1),[60] environmental (n=3),[12, 13, 62, 65] contextual (n=9),[12, 13, 61-68] and cultural (n=9)[2, 3, 12-17, 61, 64, 69, 70] contributors to health. Of note, no programs addressed political contributors of health. All of the programs used supportive mechanisms to improve health, in combination with other mechanisms, such as preventive strategies (n=6),[61-65, 68] promotive strategies (n=2)[12, 63] and rehabilitative strategies (n=1).[61]

### *Culturally Sensitive Care*

In Canada, many pregnant women are evacuated from rural Aboriginal communities for labour and delivery.[2] There is growing demand for programs that permit women to stay within their own communities and in closer proximity to their families and support systems for their entire pregnancy, including labour and delivery, with the use of midwifery programs.[2] In Manitoba, women from First Nations communities have expressed concern regarding the practice of evacuation for delivery. Midwifery, with a woman centered and less medical approach to care, coupled with local capacity building and educational programs supporting culturally relevant care, is a preferred solution.[2] Further, these women have identified that midwifery care should incorporate healing aspects of Aboriginal midwifery and tradition and be led by community elders, with the clinical skill of the 'Western' medical care system.[2] To this end, several midwifery programs have been implemented in Canada to support women in staying close to home for delivery.

Prior to 1986 women from Nunavik were transferred to South Quebec for delivery to give birth.[69] Since that time, some women in Inukjak, Nunavik have been able to deliver locally, and some have been transferred to Povungnituk, Nunavik which has a small hospital (Table 11).[69] Others still required transfer to South Quebec.[69] While the program in Nunavik is long standing, vaginal delivery is the only local option and women cannot be transferred to other sites during labour.[69] Despite this potential concern, over 70% of Inukjak pregnancies were delivered locally over a five year period with only 4.5% of mothers requiring medical evacuation and a perinatal mortality rate of 0.7%. Although these data were derived from a descriptive study with limited scientific rigour due to concerns for selection bias, information bias and control of cofounders, uptake for programs that allow women a choice to deliver close to home when medically safe is apparent: as of 2002, no women went to Povungnituk by choice for delivery. This program is an example of the power of cultural safety in women's decision making and the value of community and differing concepts of risk. Despite what can be learned about cultural safety from this program, due to poor scientific quality to assess

outcomes, it is considered a least promising practice. Stronger evaluation methods are needed to identify the true promise of this program.

**Table 11.** Detailed description of the Houd, S., Qunujuak, J., Epoo, B. study.[69]

| | |
|---|---|
| **Description** | A program, focused on helping Aboriginal women remain in their local community to give birth, that provided senior and student midwifery (pregnancy, labour, and delivery) services. To ensure safety, a local advisory committee, in conjunction with the local midwifery team, made decisions about transfers prior to delivery. Prenatal care is available locally (Inukjak, Nunavik) or by transfer to Povungnituk, Nunavik or South Quebec. |
| **Population** | Rural Aboriginal |
| **Location** | Inukjak, Nunavik, Canada |
| **Study Methods** | Quantitative, Observational study without control group |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 182 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Culturally Sensitive Care**<br>Over 70% of pregnancies were delivered locally over a five year period with only 4.5% of mothers requiring medical evacuation, suggesting an interest in local delivery and potential for local programming. |
| **Contributors** | Cultural |
| **Mechanisms** | Supportive |

The Rankin Inlet Birthing Program in Canada provides midwifery services in the Northwest Territories, Canada (Table 12).[12, 13] The project was developed at the request of community residents to bring birthing back to their community.[12, 13] Caesarean deliveries are available in Winnipeg and Thompson, Manitoba, however, it is estimated to take up to eight hours to reach either location by air Medevac.[13] Use of the Rankin Inlet Birthing Program increased from 25% in the first year to over 36% in the second year, again suggesting uptake of local delivery options.[13] The program is felt to be at risk financially because of the current policy that primipara (first) pregnancies should be evacuated due to lack of a prenatal and delivery history to identify potential risk status.[13] Primigravida deliveries were examined to identify the number of unexpected complications (33.3%) and to promote primigravida delivery in Rankin Inlet to enhance sustainability of the program.[12] The Rankin Inlet Birthing Program was characterized as having mid quantitative and low qualitative scientific rigour due to limited reflexivity and transferability. Although, the results reported were process ones rather than outcomes they were positive including increases in uptake of local delivery. The program was characterized as having moderate cultural sensitivity, and as such shows promise.

**Table 12.** Detailed description of the Chamberlain, M., Nair, R., Nimrod, C., Moyer, A., England, J.[12] and England, J.[13] studies

| | |
|---|---|
| **Program Name** | *Rankin Inlet Birthing Project* |
| **Description** | This program was the first midwife-operated community birthing center and was founded (1992) in an isolated Canadian health center. Two nurse midwives provided antenatal and post natal care to all pregnant women and delivered those designated as low risk for complications. |
| **Population** | Aboriginal women |
| **Location** | Northwest Territories, Canada |
| **Study Methods** | Mixed Methods, Observational study without control group |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 54 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Culturally Sensitive Care**<br>An 11% increase in the use of the program by local women for delivery between the first and second year of its operation suggests local uptake of the program. Unexpected complications during delivery occurred in one third of primipara pregnancies, providing additional data to support women's decision making during first pregnancies. |
| **Contributors** | Cultural, Contextual, Environmental |
| **Mechanisms** | Promotive, Supportive |

In 2004, the University College of the North in Manitoba, began developing a direct-entry baccalaureate Aboriginal midwifery training program to support localized midwifery services (Table 13).[2] The program became operational in 2006, and allows graduates to become licensed with the provincial regulatory body.[2]As of 2009, the first graduates of the program were pending, however, because of the program's existence midwives have been recruited to the region for teaching purposes, indirectly increasing the number of practicing midwives and local births.[2]To better support Manitoban midwives in practicing in rural communities, and thereby reducing the evacuation of pregnant women, the educational program expanded the traditional roles of midwives to include more well-women care, service, emergency care training, and prescriptive privileges.[2]This very promising program was the only one identified that ranked high in both qualitative scientific rigour and cultural sensitivity and can serve as an example for other communities as a very promising practice.

**Table 13.** Detailed description of the Kreiner, M. study. [2]

| | |
|---|---|
| **Program Name** | *Aboriginal Bachelor of Midwifery Program* (University College of the North) also called *Kanaci Otinawawasowin* (Sacred Midwifery in Cree) or *'Delivering Diversity'* |
| **Description** | Based in northern towns and First Nations communities with links to the Northwest Territories and Nunavut, this program is the first Aboriginal midwifery education program in Canada. Its goal is to return childbirth back into Inuit communities, which presently evacuate the majority of pregnant women for childbirth. Incorporated within this program are Aboriginal 'ways of knowing' and learning in all aspects of teaching and practice. Kanaci Otinawawasowin graduates are provided the opportunity to register with their provincial regulatory body, which gives them the option to practice off-reserve. |
| **Population** | Aboriginal, Métis, Inuit, First Nation & all who self identify as Aboriginal, regardless of legal status |
| **Location** | Manitoba, Canada |
| **Study Methods** | Qualitative |
| **Scientific Appraisal** | High |
| **Cultural Appraisal** | High |
| **Final Sample Size** | 26 (the sample for this study comprised of professionals and stakeholder groups who were involved in the implementation of the midwifery program) |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Culturally Sensitive Care** This Manitoba-based midwifery program has instilled hope, among Aboriginal communities of Manitoba, that a sustainable, culturally sensitive, solution may allow childbirth to return back to their communities. |
| **Contributors** | Cultural |
| **Mechanisms** | Supportive |

As an alternative to exclusive midwifery programs, some communities have employed a joint model of prenatal care. The Mums and Babies program in Townsville, Queensland, provides prenatal care with an integrated medical team that includes Aboriginal health workers, midwives, child health nurses, doctors, obstetrics professionals, and Aboriginal outreach workers [14,15] (Table 14). The Mums and Babies program was developed in response to rates of preterm birth, low birth weight, and perinatal mortality that were twice as high among Aboriginals compared with non-Aboriginals.[14] This program is an example of improving service delivery and uptake to an Aboriginal population by employing community members to deliver services. Program participants delivered more babies in the local hospital and attended more antenatal care visits compared to historical or contemporary non-program participants (median seven versus three visits respectively). [14,15] The number of antenatal care visits now aligns with the standards set by the WHO.[74] Further, a high proportion of participants had at least one ultrasound (88%) and were screened for sexually transmitted diseases (90%).[14] There were also significantly fewer preterm births. This program is a promising practice for a number of reasons. Prenatal care improved in a number of areas indicating sound program logic and outcomes were improving compared to both a contemporary and historical control group. Identified as promising this program scored mid for scientific rigour and had good reach and uptake.

**Table 14.** Detailed description of the Panaretto, K., Lee, H., Mitchell, M., et al.[14] and Panaretto, K.S., Mitchell, M.R., Anderson, L. et al.[15] studies

| | |
|---|---|
| **Program Name** | *Mums and Babies* |
| **Description** | An integrated model of prenatal care for Indigenous pregnant women in the city of Townsville. An important feature of the program was involvement of Aboriginal health workers. |
| **Population** | Aboriginal, Torres Strait Islanders, Indigenous |
| **Location** | Townsville, Queensland, Australia |
| **Study Methods** | Quantitative, Cohort study |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 865 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Labour and Delivery**<br>Inclusion of community members, such as Aboriginal Health Workers, in the provision of care increased the number of prenatal visits women attended and reduced the rates of preterm birth. These findings suggest an opportunity to provide supports for urban-dwellers that may increase cultural safety. |
| **Contributor to Health** | Cultural |
| **Program Mechanism** | Supportive |

Given preliminary data suggesting support and uptake for midwifery programs, additional research has focused on understanding the experiences of midwives and other care providers. One such study assessed the experiences of Aboriginal Maternal and Infant Care (AMIC) workers and midwives in the Anangui Bibi Family Birthing program in South Australia (Table 15).[16] The program is hospital based with a partnership between the AMIC workers, to provide cultural advocacy and midwives, to provide clinical care.[16] This type of partnership extends the midwifery model in urban centres to address the needs of Aboriginal women living off-reserve. Interviews with the AMIC workers and midwives suggest that the partnership was mutually satisfying and provided opportunities for both roles.[16] These individuals also felt that their partnerships led to increased use of services by pregnant women.[16] Given the mid scientific rigour scoring, it will be valuable to continue evaluation to strengthen the evidence about the effectiveness and feasibility of birthing programs and partnerships. Of note, the program was one of three programs that addressed culturally sensitive care and scored high in cultural sensitivity, as such, it provides an example of culturally sensitive care provision and is considered a promising program.

**Table 15.** Detailed description of the Stamp, G. E., Champion, S., Anderson, G., et al.[16] and Stamp G, Champion S, Zanet P et al.[17] studies.

| | |
|---|---|
| **Program Name** | *Anangu Bibi Family Birthing Program* |
| **Description** | A culturally focused birthing program developed in partnership with Aboriginal communities. As part of this program, Aboriginal Maternal and Infant Care (AMIC) midwives work in partnership to provide pre and post-partum care to Aboriginal mothers and families at two sites in regional South Australia. |
| **Population** | Aboriginal women in South Australia |
| **Location** | South Australia |
| **Study Methods** | Qualitative study |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | High |
| **Final Sample Size** | 9 workers following 45 births |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Culturally Sensitive Care**<br>After initial resistance to a culturally-focused Aboriginal birthing program, inter-cultural partnerships emerged; skill sharing and two-way learning was facilitated as well as the creation of a culturally sensitive and aligned environment for Aboriginal mothers and their families. |
| **Contributors** | Cultural |
| **Mechanisms** | Supportive |

Although midwifery programs have shown promise in providing culturally sensitive care to women closer to home, further evaluation of outcomes are needed to determine which programs are most efficient. In addition to outcome information, there is interest in better understanding the cost efficacy of such programs. One such analysis identified that the cost of a joint (health workers, midwives, and general practitioners) community based program was $A1200 per client, considered to be a modest cost (Table 16).[3] Although the program did not show improvements in birth weight or perinatal survival, there was an increase in the number of antenatal visits and in the attendance for antenatal testing.[3] The program was deemed to have high cultural sensitivity, further evidenced by high levels of satisfaction from Aboriginal women.[3] The program can be considered very promising given the modest cost and improvements noted in service uptake, as well as indications of the program being strongly valued.[3]

**Table 16.** Detailed description of the Jan S., Conaty, S., Hecker, R., Bartlett, M., Delaney, S., Capon, T. study.[3]

| | |
|---|---|
| **Program Name** | *Daruk Aboriginal Medical Service* |
| **Description** | A community-controlled midwifery health service based in an Aboriginal community in Australia. Considering the circumstances of its client population, basic primary care services are provided in collaboration with hospitals and prisons. The midwifery program is run by a full time Aboriginal health care worker, a non-Aboriginal midwife and two female General Practitioners. Midwifery program services include regular antenatal checkups, transport, home visits, labour and delivery support, management of high risk pregnancy in the community and the provision of cultural awareness sessions with local hospital staff. |
| **Population** | Aboriginal |
| **Location** | Western Sydney |
| **Study Methods** | Mixed methods, Cohort study |
| **Scientific Appraisal** | Quantitative: Mid; Qualitative: Mid |
| **Cultural Appraisal** | High |
| **Final Sample Size** | 380 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Culturally Sensitive Care**<br>Increased uptake of antenatal visits and testing, coupled with an economic analysis that identified modest costs, suggests promise in the use of health workers, midwives, and general practitioners to jointly deliver prenatal care. Although improvements in health outcomes, birth weight or perinatal survival, were not observed, the program does show uptake by local women. |
| **Contributors** | Cultural |
| **Mechanisms** | Supportive |

In some areas other strategies have been developed to support better access to, and uptake of, prenatal care to improve birth outcomes. The infant mortality rate for Aboriginal infants in the Northern Territories of Australia is more than three times the rate for non-Aboriginal infants: 21.8 and 6.7 infant deaths per 1,000 live births respectively.[70] Other indicators of quality of care suggest opportunities for improved prenatal care in this region.[67] For example, asymptomatic bacteria has been linked to pyelonephritis which in turn is associated with low birth weight or preterm birth and has been used as an indicator of quality of prenatal care.[67, 80, 81] Only 32% of positive screening results for asymptomatic bacteria were appropriately treated with antibiotics in the Northern Territories in Australia, suggesting an opportunity to improve the quality of care provided to Aboriginal women in this region (Table 17). [67] This activity and study was identified as least promising due to low cultural sensitivity, mid scientific rigour but negative outcomes and lack of reach.

**Table 17.** Detailed description of the Bookallil, M., Chalmers, E., Bell, A. study.[67]

| | |
|---|---|
| **Program Name** | *Pyelonephritis Prevention in Aboriginal Pregnant Women* |
| **Description** | Using asymptomatic bacteriuria as an indicator, this study measured the quality of prenatal care in rural and remote regions of the Northern Territory by examining the compliance of staff with prenatal care protocols. |
| **Population** | Indigenous Australian |
| **Location** | Northern Territories, Australia |
| **Study Methods** | Quantitative, Observational study without control group |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 268 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Culturally Sensitive Care**<br>Pyelonephritis (an infection that can be caused by un-treated asymptomatic bacteriuria) has not been prevented in Indigenous Australian women living in rural and remote regions of the Northern Territory. Indeed, only 34% of women screening positive for pyelonephritis were appropriately treated with antibiotics. |
| **Contributors** | Contextual |
| **Mechanism** | Supportive |

In response to poor birth outcomes, an intervention was developed to increase prenatal care to reduce such disparities in the Northern Territories of Australia (Table 18).[70] The Strong Women, Strong Babies, Strong Culture program (SWSBSC) partners senior women in the community with younger women with a goal of supporting women preconception and during pregnancy.[70] Senior women advise their partners to seek care early during pregnancy and refrain from high-risk behaviours.[70] Despite being characterized as having low scientific rigour with a risk of selection and information bias as well as confounding, the program shows some promise. The evaluation identified that infants born to program participants had improved birth weights compared to no improvements for non-participants over the same time period.[70] Further evaluation with a comparable control group coupled with an examination of program integrity is needed. The high cultural sensitivity scores for the program warrant a closer examination for applicability to other settings and Aboriginal populations as a promising program.

**Table 18.** Detailed description of the d'Espaignet, E.T., Measey, M.L., Carnegie, M.A., Mackerras, D. study. [70]

| | |
|---|---|
| **Program Name** | *Strong Women, Strong Babies, Strong Culture (SWSBSC)* |
| **Description** | A community-based intervention program whereby senior Aboriginal women in rural and remote Northern Territory communities were employed to work with younger Aboriginal women to assist them in healthy preparation for, and support during, pregnancy |
| **Population** | Aboriginal |
| **Location** | Northern Territories, Australia |
| **Study Methods** | Quantitative, Cohort study |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 12,918 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Culturally Sensitive Care**<br>Pregnant women participating in the program showed improvements in birth weight compared to a control group over the same period of time, suggesting that additional evaluation is needed. |
| **Contributors** | Cultural |
| **Mechanisms** | Supportive |

Other strategies have also been implemented to provide culturally sensitive care for Aboriginal women. For example, the Woodwinds Hospital in Minnesota developed policies that allow for traditional practices to be incorporated with hospital based care (Table 19).[60] With these policies, Native American women may choose to have sacred objects with them during delivery, burn sage or sweet grass as part of traditional ceremonies, and conduct other religious ceremonies with a medicine man or women.[60] These activities contribute to culturally safe care.[82] While this study is an example of providing culturally sensitive care, the impact of these new policies requires a stronger evaluation of their impact.

**Table 19.** Detailed description of the Louwagie, M. study. [60]

| | |
|---|---|
| **Program Name** | *Woodwinds Hospital Maternal Unit (Doula Program)* |
| **Description** | A holistic maternal program designed to support Native American Indian mothers' spiritual and healing practices during labour and delivery. This hospital unit allows patients to incorporate sacred spiritual traditions into the birthing process, such as herb burning (sweet grass, sage, cedar, tobacco and other medicinal herbs), the displaying of sacred objects (eagle or other sacred feathers, tobacco ties, beaded articles, leather pouches) and the practice of Native American medicine, which includes the performance of a religious ceremony whereby singing, drumming, smoking a sacred pipe and burning sacred herbs are carried out. |
| **Population** | Native American Women |
| **Location** | Minnesota, United States |
| **Study Methods** | Qualitative |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | Not reported |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Culturally Sensitive Care**<br>Respect for sacred ceremony and uninterrupted privacy during the Native American Indian birthing process was embraced by Woodwinds Hospital staff. |
| **Contributors** | Spiritual |
| **Mechanisms** | Supportive |

### *Mental Health*

Although there is substantial research to better understand postpartum depression (PPD), there is less understanding of antenatal depression or depression during pregnancy.[66] Only one program, Healthy Mother, Healthy Baby, was identified that addressed maternal mental health during the prenatal period (Table 20).[66] The program was located in Canada and its evaluation used a quantitative observational study design. Despite ranking low for scientific rigour due to risk for information and selection bias as well as limited community capacity building (cultural alignment), the program did score in the mid range on cultural sensitivity.

Preliminary evidence from the Healthy Mother, Healthy Baby program suggests that due to the comparability of postpartum and antenatal depression, the use of the Edinburgh Postpartum Depression Scale (EPDS) may be an appropriate screening tool for depression during pregnancy in Canadian Aboriginal populations.[66] However, this less than promising study requires further validation with stronger evaluation methods.[66] The identification of depression in perinatal substance abuse rehabilitation programs points to the need to provide mental health services for those clients.

**Table 20.** Detailed description of the Bowen, A. & Muhajarine, N. study.[66]

| | |
|---|---|
| **Program Name** | *Healthy Mother, Healthy Baby (HMHB)* |
| **Description** | A prenatal outreach program that provides home visit support to approximately 500 Canadian women and teenagers annually. This program provides additional prenatal support for pregnant Aboriginal women by providing them with individualized prenatal education, nutrition advice, supplements, and individual support, in the attempt to reduce maternal risk activities (i.e. smoking, drug and alcohol intake). |
| **Population** | Aboriginal |
| **Location** | Saskatoon, Saskatchewan, Canada |
| **Study Methods** | Quantitative: Observational study without control groups |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 39 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Mental Health**<br>Preliminary data suggests that the Edinburgh Postnatal Depression scale may be an appropriate screening tool for antenatal depression among Aboriginal women in Canada. |
| **Contributors** | Contextual |
| **Mechanisms** | Supportive |

### *HIV Testing and Transmission*

Two programs were identified that addressed HIV testing and maternal-infant transmission during the prenatal period. Prenatal HIV testing is offered to women as a mechanism to implement strategies to prevent HIV maternal-infant transmission of HIV (Table 21). [63] First Nations women in Alberta were nearly twice (OR=1.91, 95% CI: 1.42-2.58) as likely to decline prenatal HIV testing in comparison to their non-First Nations counterparts. [63] Given reduced HIV testing during pregnancy and perception of low risk by Aboriginal youth preconception[71] there is opportunity to further explore HIV testing in First Nation communities, explore community value of such testing, and to develop culturally acceptable approaches to enhance testing and treatment. The first step to improving acceptance of HIV testing is to better understand the reasons that

women accept or decline this service. Among First Nations participants, women were more likely to decline testing from a male health care provider. [63] Further, First Nations women between the ages of 20 and 24 years were more likely than other age cohorts to decline testing. [63] Although the information provided in this study is potentially useful for program planners; a program or initiative is not described or evaluated, contributing to a characterization as least promising.

**Table 21.** Detailed description of the Wang, F., Larke, B., Gabos, S., et al. study. [63]

| | |
|---|---|
| **Description** | This study examined factors that may affect the decision to accept a prenatal HIV test in an "opt-out" routine Canadian HIV testing program. |
| **Population** | First Nations |
| **Location** | Alberta, Canada |
| **Study Methods** | Quantitative, Cohort Study |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 38,712 pregnant women; 2,007 caregivers |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Mental Health**<br>The characteristics of both the pregnant woman and their prenatal care provider may contribute to the decision to not accept an HIV test in an "opt-out" routine prenatal HIV screening program. |
| **Contributors** | Contextual |
| **Mechanisms** | Supportive, Preventive, Promotive |

Among pregnant HIV-positive women, prenatal care through a multidisciplinary team reduced the likelihood of maternal-infant HIV transmission (Table 22).[65] The multidisciplinary team included two Aboriginal health workers, a public health nurse, a clinician, and a secretary.[65] The team provided primary medical care and support to the pregnant Aboriginal women.[65] Although there were no differences in terms of birth weight, perinatal mortality, caesarean section, or HIV perinatal transmission, there was a difference in the rates of HIV perinatal transmission depending on the type of care received. Indeed, of the 22 Aboriginal women receiving care through the multidisciplinary team, there was only one case of perinatal HIV transmission.[65] This promising practice succeeded in reducing maternal-infant transmission of HIV by providing culturally appropriate care. [65]

**Table 22.** Detailed description of the Gilles, M., Dickinson, J., Cain, A., et al. study. [65]

| | |
|---|---|
| **Description** | An evaluation of treatment outcomes of HIV positive pregnant women who received care from any hospital in Western Australia. This study's authors speak of one (the Royal Perth Hospital) of three metropolitan-based teaching hospitals where adult HIV services are provided. This hospital has a statewide function and employs a nurse to coordinate specialist care for HIV positive people living in rural and urban areas. |
| **Population** | Aboriginal |
| **Location** | Perth, Western Australia, Australia |
| **Study Methods** | Quantitative, Cohort study |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 41 pregnant with 54 live births |
| **Key Finding(s)** | **Prenatal Care and Delivery: HIV Testing and Transmission**<br>Through the use of culturally appropriate, intensive, multidisciplinary care without elective cesarean delivery, similar pregnancy outcomes may be achieved in HIV positive Aboriginal and HIV positive non-Aboriginal women. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Supportive, Preventive |

### *Alcohol, Drug, or Tobacco Use during Pregnancy*

Consumption of alcohol, drugs, or tobacco during pregnancy is known to increase the risk of poor birth outcomes.[83] Aboriginal populations are at increased risk of alcohol, drug, and tobacco consumption during pregnancy and the associated poor birth outcomes.[75, 76] As previously described, there is an increased risk of FASD in Aboriginal communities.[75, 76] The average incidence of FASD in high risk American Indian communities was estimated at 9-10 per 1,000 births compared to 0.5-2 in the general US population.[75, 76] Three programs or services were identified that addressed drug, alcohol, or tobacco use during pregnancy.

Four communities in British Columbia, Canada developed community based FASD prevention programs in partnership with researchers called the Healthy Communities, Mothers, Babies project (Table 23).[62] Although evaluations are still pending, all four communities have established programs.[62] This outcome indicates high levels of community uptake in program development, which was further evidenced by high scores on community capacity building. The program shows some promise in that there is interest in Aboriginal communities to develop programming and the mid cultural appraisal score. However, results from outcome evaluations will be essential to provide evidence of impact of these programs and thus at this point the program is considered less promising.

**Table 23.** Detailed description of the George, M.A., Masotti, P., MacLeod, S., et al. study.[62]

| | |
|---|---|
| **Program Name** | *Healthy Communities, Mothers, Babies (HCMC)* |
| **Description** | An FASD prevention program in geographically distant Aboriginal communities in Canada adapted US designed standard Brief Alcohol Intervention guidelines to target women in their community for the purpose of reducing their alcohol consumption during pregnancy. |
| **Population** | Aboriginal |
| **Location** | British Columbia, Canada |
| **Study Methods** | Qualitative |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 4 communities |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Alcohol, Drug, and Tobacco Use** The development of community-specific programs in four British Columbia communities indicates uptake among Aboriginal communities to develop programming specific to their contexts, cultures, and needs. Evaluations are needed to determine the effectiveness of developed programs in all four communities. |
| **Contributors** | Environmental, Contextual |
| **Mechanisms** | Preventive, Supportive |

Another program, described previously, aimed to reduce alcohol consumption prior to and during pregnancy. This was accomplished by providing enhanced case management to women who were at extremely high risk for drinking during pregnancy. As described, the program showed mixed findings and was considered less promising (see Table 9).[18]

Fifty two percent of Indigenous women report smoking during pregnancy compared to 16% of their non-Indigenous counterparts,[61, 84] increasing the risk for poor birth outcomes including perinatal mortality, preterm birth, and low birth weight (Table 24).[61, 84, 85] In order to develop effective interventions to reduce cigarette use during pregnancy, it is necessary to understand the reasons for smoking during pregnancy.[61] Indigenous women reported that smoking provided relaxation and was considered an acceptable behaviour.[61] Pregnancy did not change women's attitudes towards smoking, however, there was limited knowledge of the risks of cigarette use during pregnancy.[61] As such, while reduced cigarette use during pregnancy was seen as positive, smoking cessation was not considered a priority.[61] Further, Indigenous Health Workers reported concern in advocating smoking cessation, recognizing the need to maintain a positive relationship with Indigenous women.[61] Further consideration and community consultation may inform future initiatives and intervention activities designed to reduce smoking during pregnancy.

**Table 24.** Detailed description of the Wood, L., France, K., Hunt, K., et al. study.[61]

| | |
|---|---|
| **Description** | This study investigated the place of, and the attitudes toward, smoking in pregnancy within the broader context of Indigenous (Australian) peoples' lives. |
| **Population** | Indigenous (Australian) |
| **Location** | Perth, Western Australia, Australia |
| **Study Methods** | Qualitative |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 50 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Alcohol, Drug, and Tobacco Use** Pregnancy did not necessarily modify attitudes related to smoking cessation for Indigenous women, and quitting was not a priority given the social and economic pressures some may experience. Indigenous Health Workers were concerned about advocating smoking cessation while still maintaining positive, supportive relationships with pregnant women. |
| **Contributors** | Cultural, Contextual |
| **Mechanisms** | Rehabilitative, Supportive, Preventive |

### *Labour and Delivery*

While there is a focus on provision of prenatal care, there is also a need to assess management and quality of services during labour and delivery. Two identified programs or activities related directly to labour and delivery. Both programs used preventive mechanisms based on the Holistic Health Model and as such there may be opportunity to increase the use of supportive mechanisms at this time period. Both programs addressed contextual contributors to health, and one also addressed cultural contributors to health.[64, 68] As such, there may be a need to consider additional contributors to health during labour and delivery including environmental or spiritual contributors to health.

Active management of third stage labour includes both physical and pharmacological strategies that facilitate placental delivery and prevent maternal blood loss (Table 25).[68, 86] Expectant management differs from active management in that health care providers take a passive approach to third stage of labour.[68] There is evidence to suggest that active management of third stage labour reduces maternal blood loss without increasing the risk of retained placenta.[68] There was a desire to establish whether benefits associated with active management of third stage labour were sustained in rural, Aboriginal populations who deliver in a hospital setting.[68] It is unclear if risks to the newborn were examined as part of the review. Preliminary evidence suggests that active management practices may be effective in rural American Indian populations but further research with a stronger study design including impact on infant outcomes is required [68]. This program had a low cultural appraisal score indicating the need and opportunity for increased community capacity building, cultural sensitivity, and service delivery. Given these limitations the study is identified as less promising.

**Table 25.** Detailed description of the Fenton, J., Baumeister, L., Fogarty, J. study.[68]

| | |
|---|---|
| **Description** | An active management protocol for third stage of delivery was implemented following a Cochrane review. The protocol consisted of early cord clamping, early oxytocin administration and cord traction. |
| **Population** | American Indian |
| **Location** | United States |
| **Study Methods** | Quantitative, cohort study |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 175 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Labour and Delivery**<br>Preliminary data suggest that active management of third stage of labour may be effective in reducing maternal blood loss among rural American Indian women. Additional evaluation is needed to asses infant outcomes and validate maternal outcomes. |
| **Contributors** | Contextual |
| **Mechanisms** | Preventive |

Low caesarean delivery rates are noted in American Indian populations in the United States.[64] One study identified that medical and practice factors were correlated with lower caesarean delivery rates.[64] Despite having low cultural alignment and sensitivity, they study did have moderate scientific rigour and positive outcomes. As such, there is an opportunity for the mainstream culture to model Aboriginal practices to reduce rates of caesarean delivery rates.

**Table 26.** Detailed description of the Mahoney, S.F. & Malcoe, L.H. study.[64]

| | |
|---|---|
| **Description** | This study investigated the low rates and risk factors of cesarean delivery in Native American women as their rates of Cesarean delivery are lower than Non Native women, |
| **Population** | American Indian |
| **Location** | United States |
| **Study Methods** | Quantitative, Case control study |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 775 |
| **Key Finding(s)** | **Prenatal Care, Labour & Delivery: Labour and Delivery**<br>The implementation of institutional and practitioner policies common to the Indian Health Service may reduce the prevalence of cesarean deliveries in other populations. |
| **Contributors** | Cultural, Contextual |
| **Mechanisms** | Preventive |

### Postpartum Care

Only one of the identified programs directly provided and evaluated postpartum care.[16] The study was completed in Australia; no programs were identified that directly addressed postpartum care in Canada, New Zealand, or the United States. While other midwifery programs likely continued to provide care postpartum, after delivery care was not the focus of the associated research or evaluation. As part of the Anangu Bibi Family Birthing program, Aboriginal Maternal and Infant Care (AMIC) workers in a joint AMIC-midwifery program in South Australia provide care for up to eight weeks postpartum (Table 15).[16] The AMIC workers provide clinical care as well as social and emotional support.[16] This study used a qualitative design to assess intercultural

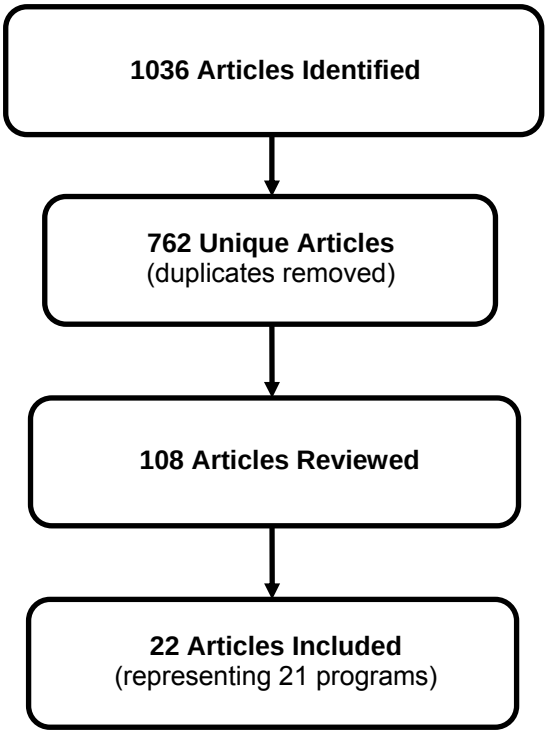
partnership and was classified as mid for scientific rigour and high in cultural sensitivity. This program serves as a promising practice for the development of culturally safe programming in Aboriginal communities. There is no published outcome evaluation as yet but both midwives and AMIC workers perceived an increased use of services via the program.[16]

## Results: Child Health & Well-being

### Search Strategy Results

Using the previously described search strategy, a total of 1036 studies were identified for child health and well-being, 762 of which were original research articles (Figure 12). A total of 108 articles were selected for full review and further assessment, based on the described inclusion criteria. Seven articles were selected for appraisal but did not arrive in time for further assessment. A total of 22 articles representing 21 programs or activities were included in the review for promising practices for child health and well-being (Appendix H). A total of 86 studies were excluded from the review (Appendix I).

**Figure 12.** Algorithm of overall synthesis strategy for child health & well-being.




### Descriptive Data: Programs and Activities

Among the 21 included studies, 16 used quantitative methods,[4, 5, 21-25, 87-96] two used qualitative methods,[27, 97] and three used both quantitative and qualitative (mixed) study methods.[26, 98, 99] Upon the completion of scientific appraisal, 19 quantitative scores (16 from purely quantitative studies, plus three from quantitative components of mixed methods studies) and five qualitative scores (two from purely qualitative studies, plus three from qualitative components of mixed methods studies) were generated.

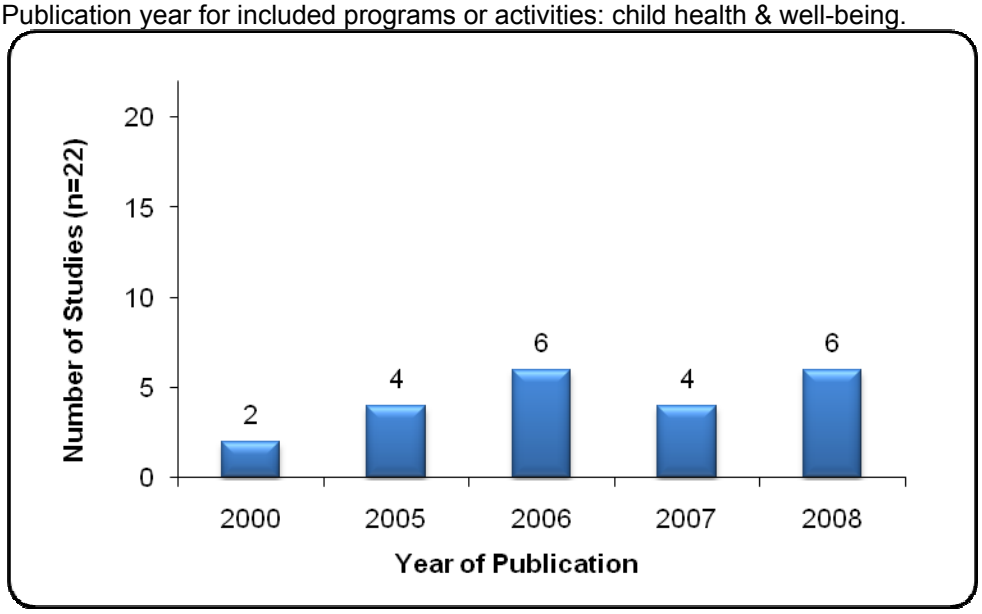
In brief, this process resulted in one study with a 'high' ranking for quantitative scientific rigour.[5] This study originated from Canada. No qualitative study ranked 'high' for scientific rigour. The cultural appraisal process resulted in a total of 21 cultural appraisal scores. Two studies scored 'high' in cultural alignment and sensitivity[23, 24] and an

additional nine were appraised within the 'mid' rank.[4, 25, 26, 87, 89, 90, 94, 97, 99] In total, more than half (n=11) of the studies scored 'mid' or 'high' for cultural appraisal.

### *Year*

Given that publications were only included if they were published in 2005 or later, more than 91% (n=20) of studies included in this report were published in the year 2005 and later. More specifically, four studies each were published in 2005 and 2007 and six studies each were published in both 2006 and 2008. Additionally, two studies were included as a result of 'hand searching' the reference lists of other included articles was published prior to 2005 (published in 2000; See Methods; Figure 13).

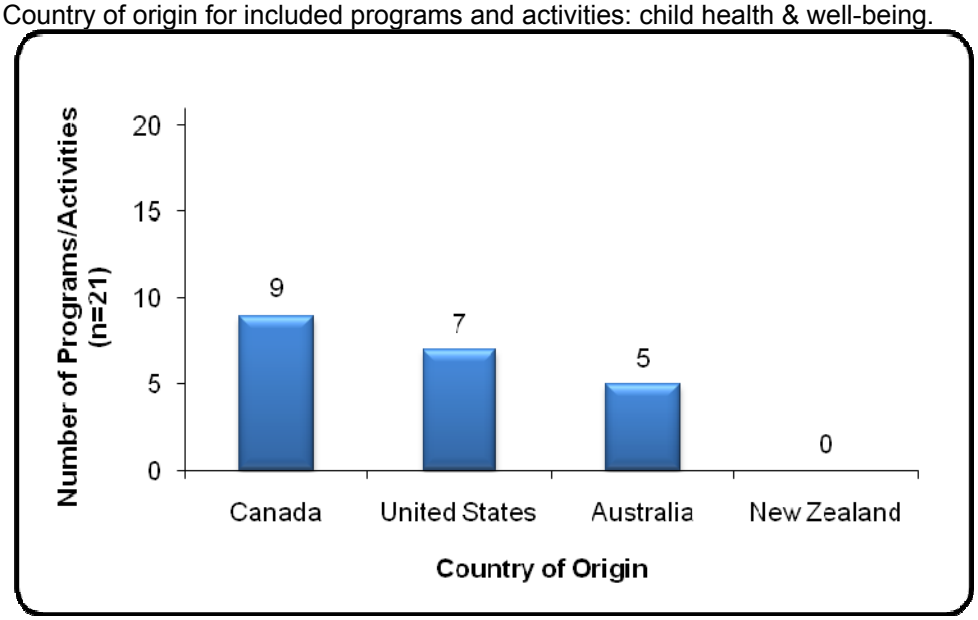
**Figure 13.** Publication year for included programs or activities: child health & well-being.




### *Country of Origin*

Nine of the 21 child health and well-being programs and activities included in this report originated in Canada,[5, 23-26, 89, 93, 94, 99] seven were conducted in the United States,[4, 22, 27, 87, 92, 95, 96, 98] and five were from Australia.[21, 88, 90, 91, 97] None of the included programs and activities were conducted in New Zealand (Figure 14).

**Figure 14.** Country of origin for included programs and activities: child health & well-being.




### *Setting*

Twelve studies did not specify setting.[4, 21, 22, 24-26, 89, 90, 92, 93, 97, 98] Five were located in rural-only settings,[5, 23, 91, 94, 99] one was located in an urban-only setting,[88] and three studies took place in both urban and rural locations.[27, 87, 95, 96]

### *Topics*

Of the 21 studies included in the analysis, eight topics emerged (Table 27). Specifically, nine studies involved healthy lifestyle promotion[24-27, 91, 93, 94, 97, 99] and three each involved oral health[5, 22, 23] and mental health & substance abuse.[4, 87, 90] Immunizations and education were each addressed in two of 21 included programs or activities, [88, 89, 95, 96, 98] while telehealth[21] and FASD[92] were each addressed in one study.

**Table 27.** Number of studies relating to topic areas of child health & well-being

| Program Topic Area | Number of Studies (N=21) |
|---|---|
| Healthy Lifestyle Promotion | 9 |
| Oral Health | 3 |
| Mental Health & Substance Abuse | 3 |
| Immunization | 2 |
| Education | 2 |
| FASD | 1 |
| Telehealth | 1 |

## Scientific Rigour

### *Qualitative studies*

Five studies received qualitative scientific appraisals, which involved appraising two exclusively qualitative studies[27, 97] and the qualitative portions of three mixed methods studies.[26, 98, 99] Of these five studies, none used a traditional qualitative study design and all used simple content analysis as an approach to identify topics related to their research questions. Four studies[26, 97-99] used participatory action research. Two studies

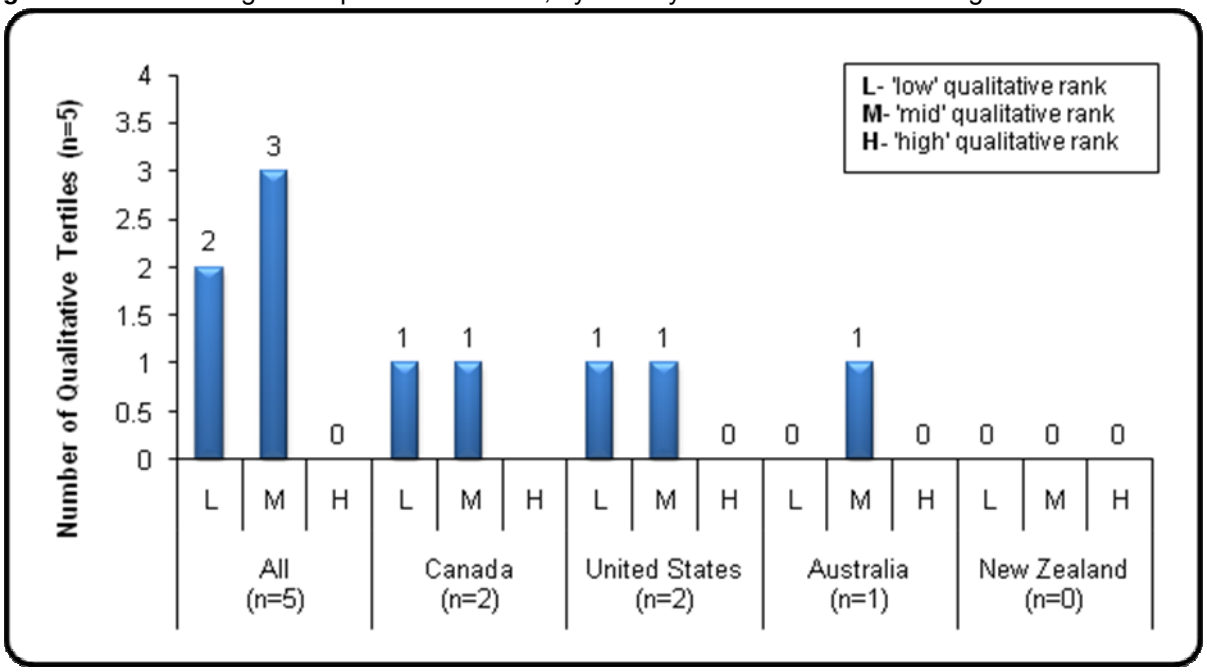
had a ‘low’ ranking,[98, 99] and three studies a ‘mid’ ranking,[26, 27, 97] for scientific rigour (Table 28).

**Table 28.** Number of studies in each level of qualitative scientific rigour: child health & well-being.

| | Level of Qualitative Scientific Rigour | | |
|---|---|---|---|
| | ‘Low’ n | ‘Mid’ n | ‘High’ n |
| **Number of Qualitative Appraisals (n=5)** | 2 | 3 | 0 |

One study from Australia,[97] one from the United States,[27] and another from Canada[26] each ranked ‘mid’ for scientific rigour. One study from the United States[98] and one from Canada[99] had ‘low’ ranking scores. (Figure 15).

**Figure 15.** Scientific rigour of qualitative studies, by country: child health & well-being.




### *Components of Qualitative Scientific Appraisal: Reflexivity, Credibility and Transferability*

Three components were used to assess qualitative scientific rigour: reflexivity, credibility and transferability. None of the qualitative appraisals (n=5) provided information regarding the investigator’s background or perspectives. Furthermore, no study’s author(s) provided information regarding his or her personal influence on their study. No author of a qualitative study clearly articulated their role in the interpretation of their program or activity data. These findings indicate that reflexivity was not present in any of the studies.

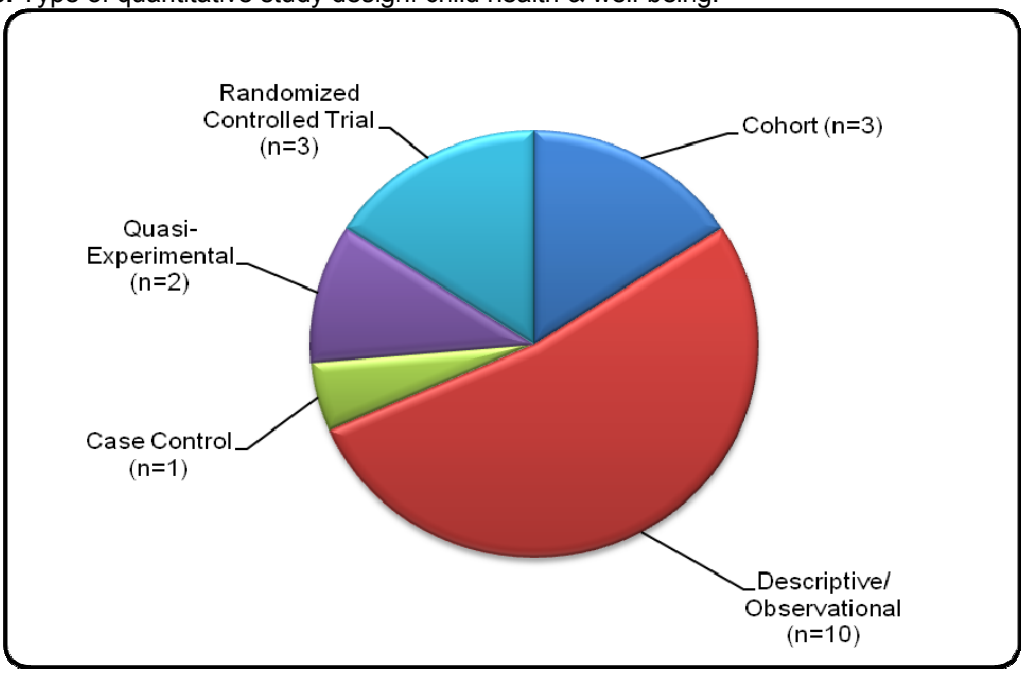
A theoretical or conceptual framework was identified as guiding the work in three[26, 27, 97] of five studies. No authors articulated potential biases in sample selection, and only two[26, 99] of five investigators clearly stated their sampling approach and demonstrated that it was consistent with their study aim. Only one[26] of five studies was considered to have a theoretically justified sampling approach. In three[26, 27, 97] of five qualitative studies, data collection activities were clearly described and in three[26, 27, 97] of five studies' authors described the limitations of their data collection approach. A systematic[97] and transparent[27] analysis approach was apparent in one study each and an approach to maintaining trustworthiness in data analysis was provided in one study.[99] Furthermore, none of the five described an analysis approach consistent with a specific qualitative tradition. These factors indicate that there was little information available on which to understand the credibility of the data interpretation.

Three[26, 27, 97] of five qualitative studies provided enough context through a description of sample characteristics to allow for consideration of transferability of findings.

## Quantitative Studies

Quantitative appraisals were completed on 19 included studies, which involved appraising 16 exclusively quantitative studies,[4, 5, 21-25, 87-96] in addition to appraising the quantitative portions of three included mixed methods studies[26, 98, 99] (*i.e.* studies that used both quantitative and qualitative methods). Of the 19 quantitative appraisals, three were classified as having a cohort study design[25, 92, 99] and ten studies were classified as descriptive/observational,[22, 23, 26, 88, 90, 91, 93-96, 98] which included studies with a pre-post design and/or studies with no control group. One study was classified as having a case-control design,[21] two were quasi-experimental,[87, 89] and three studies were randomized controlled trials (Figure 16).[4, 5, 24]

**Figure 16.** Type of quantitative study design: child health & well-being.



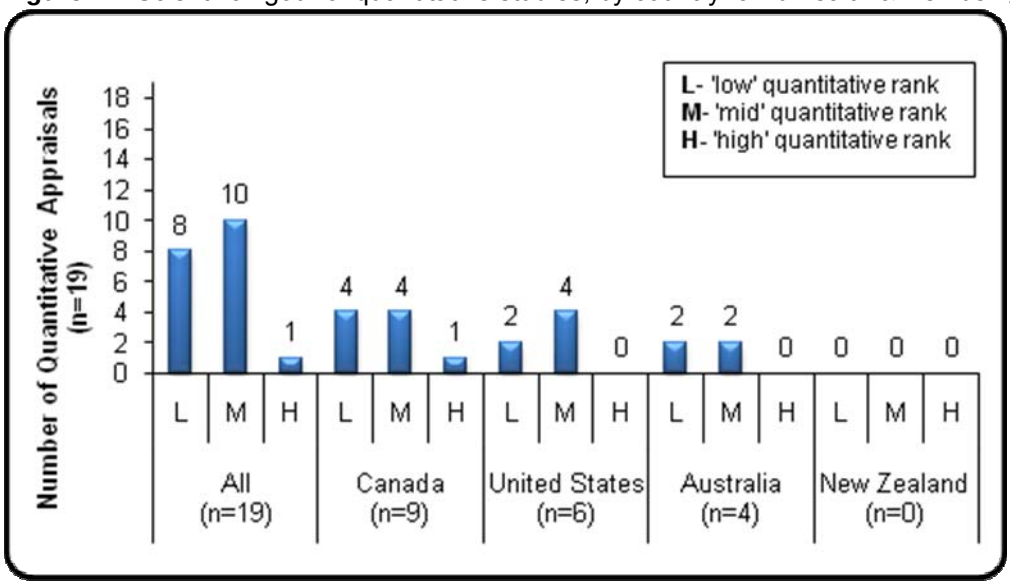
Close to 50% (n=8) of the 19 quantitative studies received a 'low' score[25, 26, 87, 88, 91, 93, 98, 99] for quantitative appraisal while ten studies[4, 21-24, 89, 90, 92, 94-96] had a 'mid' ranking. Only one quantitative appraisal was assigned a 'high' score[5] (Table 29). The limitations in the study designs need to be considered when promising practice recommendations are identified, as all but one of the programs or activities would be eliminated from consideration if high scientific rigour were the only criteria used to define 'promising practices'.

**Table 29.** Number of studies in each level of quantitative scientific rigour: child health & well-being.

| | Level of Quantitative Scientific Rigour | | |
|---|---|---|---|
| | **'Low' n** | **'Mid' n** | **'High' n** |
| **Number of Quantitative Appraisals (n=19)** | 8 | 10 | 1 |

In terms of Country, both Canada[23, 24, 89, 94] and the United States[4, 22, 92, 96] each had 4 quantitative studies of 'mid' ranking for scientific rigour, while two Australian studies[21, 90] each had a 'mid' ranking. The only 'high' scoring quantitative study included in this report was Canadian[5] (Figure 17).

**Figure 17.** Scientific rigour of quantitative studies, by country: child health & well-being.




### *Quantitative Scientific Appraisal Components: Selection Bias, Information Bias, and Confounding*

All exclusively quantitative studies (n=16)[4, 5, 21-25, 87-96] and the three quantitative portions of the mixed methods studies[26, 98, 99] included in this report were appraised for: selection bias, information bias, and confounding.

Sample eligibility criteria were specified in 13 studies[4, 5, 21-24, 88-90, 92, 93, 95, 96, 98] and 11[4, 21-23, 25, 88, 90, 92, 94-96, 99] were considered to be population based. Sample dropout rates and reasons were reported in six studies[4, 5, 22, 87, 89, 94] and loss to follow up was reported to be the same in each sample group in one study[5]. Follow up was reported at greater than 80% in three studies[23, 24, 91] and there was random sample selection in one study.[5] Specifically related to selection bias for studies that used a RCT design (n=3),[4, 5, 24] there was indication of random allocation to treatment or control groups in one.[24] Likewise, intention to treat analysis was indicted in one[5] and concealed allocation of subjects was reported in one.[5]

Prognostic exposure baseline assessments were considered valid and reliable in 17 studies[4, 5, 21-26, 87-89, 91-96, 98] and outcome assessments were considered valid and reliable measures in 18 studies.[4, 5, 21-26, 87-96, 98] Sample groups were assessed in the same manner in just over half (n=14) of all studies.[4, 5, 21-25, 87, 89-92, 95, 96, 99] Only one study reported blinding of patients and caregivers,[5] where as four studies reported blinding for the purpose of exposure or outcome assessments.[5, 22, 89, 92]

Study sample groups were considered similar on prognostic factors at baseline in less than 50% of studies (n=7)[5, 21, 24, 87, 90, 92, 94] and in six studies,[5, 21, 24, 89, 90, 92] sample groups were considered comparable on prognostic/confounding factors. Confounding factors were taken into consideration during analysis in six studies.[4, 5, 24, 25, 94-96]

### Cultural Appraisal of Programs and Activities

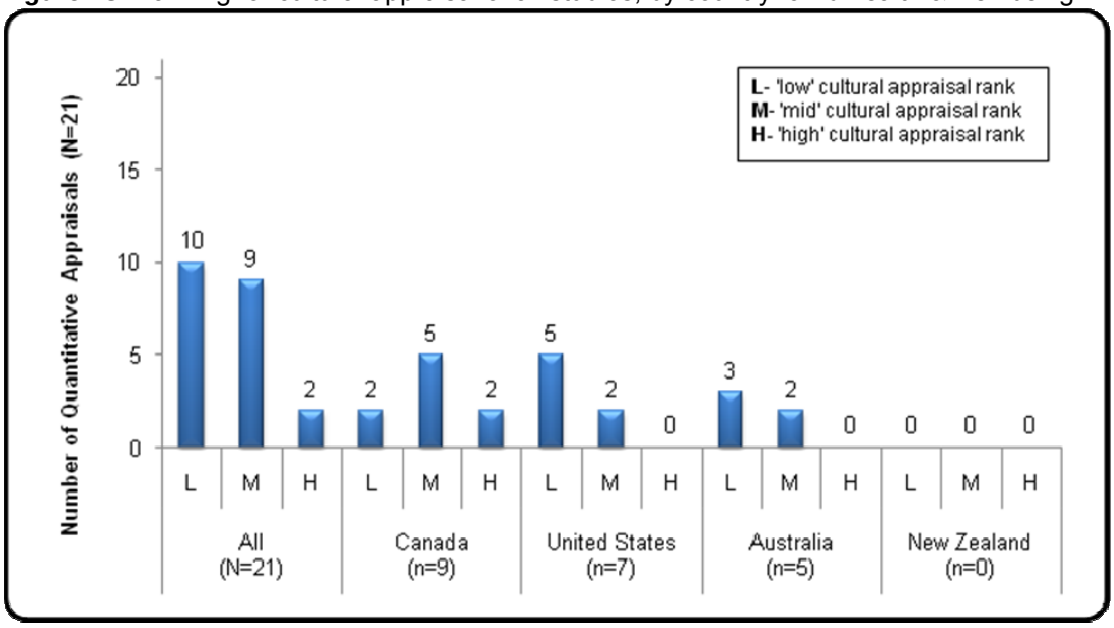
All included studies were appraised for culturally specific content using criteria that examined the extent of: cultural sensitivity, service delivery, and capacity building (three sub components of the cultural appraisal). In terms of overall appraisal scores, 10 studies ranked 'low',[5, 21, 22, 27, 88, 91-93, 95, 96, 98] 9 studies ranked 'mid',[4, 25, 26, 87, 89, 90, 94, 97, 99] and two studies ranked 'high'[23, 24] (Table 30). Of note, both 'high' ranking studies used a quantitative study design.

**Table 30.** Number of studies in each cultural appraisal ranking: child health & well-being.

| | Level of Cultural Sensitivity/Alignment | | |
|---|---|---|---|
| | 'Low' n | 'Mid' n | 'High' n |
| **Number of Programs or Activities (N=21)** | 10 | 9 | 2 |

Both studies that scored 'high' for cultural appraisal were based in Canada.[23, 24] Two studies from Australia,[90, 97] two from the United States,[4, 87] and five from Canada[25, 26, 89, 94, 99] had 'mid' scores. Five of seven studies from the United States had a 'low' score for cultural appraisal (Figure 18).

**Figure 18.** Ranking for cultural appraisal of all studies, by country: child health & well-being.



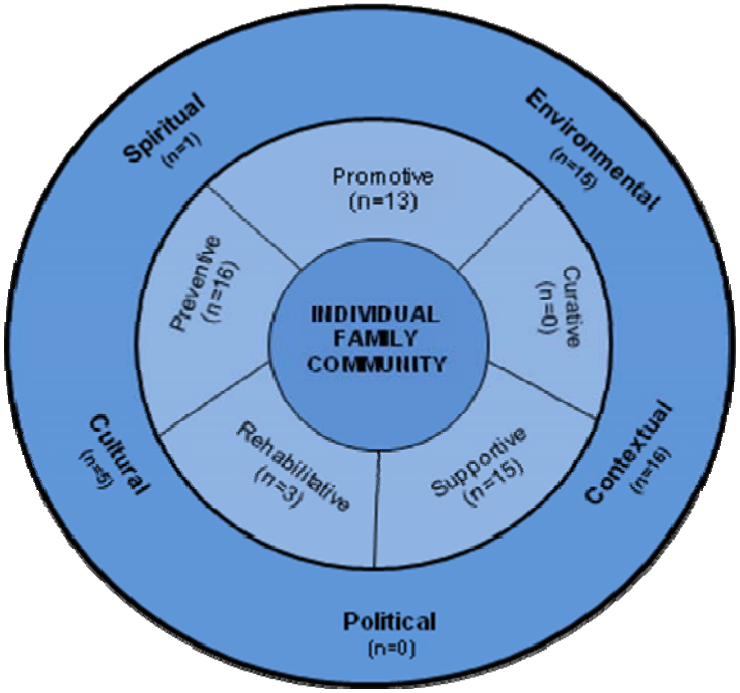
## Describing Practices Using the Holistic Health Model

As described previously (Background) the Holistic Health Model and Medicine Wheel (Figure 1) provided a framework in which to better understand health programming from an Aboriginal perspective. As such, the programs and activities were classified into cultural, contextual, environmental, spiritual, and political contributors to health (Figure 1). Further, the mechanisms used to improve health were identified including: preventive, promotive, supportive, curative, and rehabilitative. Classifications of contributors to health and mechanisms to improve health were not mutually exclusive.

A majority of the studies (n=16) included programs that addressed contextual[4, 21-23, 25, 26, 87-90, 92-94, 96-98] and environmental (n=15)[4, 21-23, 25, 26, 87-92, 96-98] contributors to health. Only five programs addressed cultural[4, 87, 90, 91, 93] contributors to health and only one program addressed spiritual[97] contributors to health. No programs addressed political contributors to health. Given this, there may be a lack of programs addressing political factors or a lack of peer-reviewed research or evaluation.

It is promising to note that a majority of programs (n=15) used a supportive mechanism[5, 21-26, 87, 90, 92-94, 97-99] based on the Holistic Health Model. This is aligned both with community driven theories of health promotion, but also reports that supportive mechanisms are preferred.[72, 73] Aligned with supportive mechanisms, 16 programs also used preventive mechanism[4, 5, 22-26, 87-89, 91, 94, 96-99] to improve health and 13 used promotive mechanisms.[5, 21-27, 91, 93, 94, 97, 99] Of note, no programs were identified that used curative mechanisms and only three[4, 89, 90] addressed rehabilitation (Figure 19).

**Figure 19.** Number of programs or activities addressing contributors to health based on the Holistic Health Model: child health & well-being.



## Promising Practices for Child Health & Well-being

Programs in this review for child health and well-being ranged from least to most promising based on their certainty of effectiveness and potential for population impact as described in the characterization of promising practice (*see* Methods). Table 31 provides a listing that includes some of the criteria examined to assign a 'promising practice' rank. Two programs were considered very promising,[4, 5] eight [23, 24, 26, 89, 92, 94-97] were considered promising, seven[21, 22, 25, 27, 87, 90, 99] were classified as less promising, and four [88, 91, 93, 98] were considered least promising from a population health perspective.

One very promising program was developed to prevent or reduce substance use among Native American youth and was implemented in grade three to five classrooms in elementary schools on reservations. The program was evaluated using a cluster randomized design.[4] The study scored mid on quantitative scientific rigour and mid on cultural appraisal. The program had positive outcomes in that after three years of implementation fewer youths in the intervention group used smokeless tobacco, alcohol, and marijuana. The development of bicultural competence was the guiding framework for the program and there was wide reach with over 1000 youths participating and strong uptake with only 14% attrition.[4] This program can serve as a model for those introducing substance abuse prevention programs in elementary schools on reserves.

The second very promising program identified in this review instituted the use of fluoride varnish twice yearly and provided caregiver education for dental care in a northwest Ontario community. This program was also evaluated using a cluster randomized study design.[5] The study scored high on quantitative scientific rigour and the program scored mid on cultural appraisal. The incidence of caries for the children receiving treatment was significantly lower than for the children whose parents received counselling alone, demonstrating positive program impact.[5] Evidence has been mounting regarding the positive effects of fluoride treatment thus the logic of the program is based in the current state of knowledge.[5] Over 800 children received the treatment indicating wide reach and uptake was strong with only 11 % attrition identified.[5]

Four promising programs focused on promoting healthy lifestyles in children.[24, 26, 94, 97] The remaining 5 programs that were not as promising were low in scientific rigour or low in cultural appraisal coupled with poor reach and/or uptake. There was one promising program each for immunization,[95, 96] education,[89] and FASD diagnosis[89, 92] (Table 31) .

**Table 31.** Summary of appraisal scores and program/activity outcome: child health & well-being.

| Promising Practices | Article Title | Cultural Appraisal Ranking | Scientific Rigour | | Outcome<br>+ positive<br>- negative<br>↔ neutral<br>? unknown |
|---|---|---|---|---|---|
| | | | Quantitative Ranking | Qualitative Ranking | |
| ***Healthy Lifestyle Promotion*** | | | | | |
| Promising | A Family-based Intervention to Promote Healthy Lifestyles in an Aboriginal Community in Canada[24] | High | Mid | NA | 1° Outcome + |
| Promising | Our Games Our Health: A Cultural Asset for Promoting Health in Indigenous Communities[97] | Mid | NA | Mid | Process + |
| Promising | Process evaluation of a multi-institutional community-based program for diabetes prevention among First Nations[26] | Mid | Low | Mid | Process + |
| Promising | A pilot school-based healthy eating and physical activity intervention improves diet, food knowledge, and self-efficacy for Native Canadian Children[94] | Mid | Mid | NA | Process +<br>1° Outcome + |
| Less Promising | Impact of a diabetes prevention program on body size, physical activity, and diet among Kanien'keha:ka (Mohawk) children 6 to 11 years old: 8-year results from the Kahnawake schools diabetes prevention project[25] | Mid | Low | NA | Process +<br>1° Outcome ↔ |
| Less Promising | The VERB Campaign's Strategy for Reaching African-American, Hispanic, Asian, and American Indian Children and Parents[27] | Low | NA | Mid | Process + |
| Less Promising | Implementing Empowering Health Promotion Programmes for Aboriginal Youth in Two Distinct Communities in British Columbia, Canada[99] | Mid | Low | Low | Process +<br>1° Outcome ↔ |
| Least Promising | Are there Health Benefits from Improving Basic Nutrition in a Remote Aboriginal Community?[91] | Low | Low | NA | 1° Outcome + |
| Least Promising | Feeding Patterns and Weight Among First Nations Children[93] | Low | Low | NA | 1° Outcome + |
| ***Oral Health*** | | | | | |
| Very Promising | A 2-year community-randomized controlled trial of fluoride varnish to prevent early childhood caries in Aboriginal children[5] | Low | High | NA | 1° Outcome + |
| Promising | 3-Year results of a collaborative | High | Mid | NA | 1° Outcome + |

| Promising Practices | Article Title | Cultural Appraisal Ranking | Scientific Rigour | | Outcome<br>+ positive<br>- negative<br>↔ neutral<br>? unknown |
|---|---|---|---|---|---|
| | | | Quantitative Ranking | Qualitative Ranking | |
| | school-based oral health program in a remote First Nations community[23] | | | | |
| Less Promising | An Observational Study of the Association of Fluoride Varnish Applied During Well Child Visits and the Prevention of Early Childhood Caries in American Indian Children[22] | Low | Mid | NA | 1° Outcome + |
| ***Mental Health & Substance Use*** | | | | | |
| Very Promising | Preventing substance use among Native American Youth: three-year results[4] | Mid | Mid | NA | 1° Outcome + |
| Less Promising | Results of an Alcohol Prevention Program with Urban American Indian Youth[87] | Mid | Low | NA | 1° Outcome + |
| Less Promising | The role of an Indigenous Health Worker in contributing to equity of access to a mental health and substance abuse service for Indigenous young people in a youth detention centre [90] | Mid | Mid | NA | Process +<br>1° Outcome ↔ |
| ***Immunization*** | | | | | |
| Promising | The Alaska Haemophilus influenzae Type b Experience: Lessons in Controlling a Vaccine-Preventable Disease [95, 96] | Low | Mid | NA | 1° Outcome + |
| Least Promising | Evaluation of a targeted immunization program for Aboriginal and Torres Strait Islander infants in an urban setting[88] | Low | Low | NA | Process +<br>1° Outcome + |
| ***Education*** | | | | | |
| Promising | Innovative Programs for Improvement in Reading Through Cognitive Enhancement: A Remediation Study of Canadian First Nations Children[89] | Mid | Mid | NA | 1° Outcome + |
| Least Promising | Best Practices: A Cross-site Evaluation[98] | Low | Low | Low | Process +<br>1° Outcome + |
| ***Telehealth*** | | | | | |
| Less Promising | Accuracy of pre-recorded video images for the assessment of rural indigenous children with ear, nose and throat conditions[21] | Low | Mid | NA | 1° Outcome + |
| ***FASD Diagnosis*** | | | | | |
| Promising | A Practical Clinical Approach to Diagnosis of Fetal Alcohol Spectrum Disorders: Clarification of the 1996 Institute of Medicine Criteria[92] | | Low | Mid NA | Process + |

## Better Understanding the Practices: Child Health & Well-being

### Overview

The following section describes the 21 programs included in child health and well-being review. However, supplemental material was obtained from excluded articles to provide an in depth understanding of the state of practice and services research/evaluation for childhood well-being.

Of the studies that met the inclusion criteria, programs were categorized as relating to healthy lifestyle promotion, oral health, mental health and substance use, immunization, education, telehealth, and FASD diagnostic criteria. The identified programs were further classified into the Medicine Wheel and Holistic Health Model categories of environmental, cultural, political and spiritual contributors to health and well-being Further, programs were reviewed for their mechanisms of service provision: rehabilitative, preventive, promotive, supportive or curative.

### Summary of Included Programs and Practices

A total of nine articles were identified for healthy lifestyle promotion,[24-27, 91, 93, 94, 97, 99] three articles were identified for oral health[5, 22, 23] as well as mental health and substance abuse.[4, 87, 90] Two articles each were identified for immunization[88, 95, 96] and education,[89,98] while one article each was identified for telehealth[21] and FASD diagnostic criteria[92] (Table 32).

**Table 32.** Number of programs relating to each topic area of interest: child health & well-being

| Topic Area | Related Programs (n) |
|---|---|
| Healthy Lifestyle Promotion | 9 |
| Oral Health | 3 |
| Mental Health & Substance Use | 3 |
| Immunization | 2 |
| Education | 2 |
| Telehealth | 1 |
| FASD: Diagnostic Criteria | 1 |

### Healthy Lifestyle Promotion

In comparison to non-Aboriginal populations, Aboriginal populations in Canada generally exhibit poorer health.[100] Much of this disparity in health can be attributed to preventable diseases such as obesity, which in turn predisposes individuals to endocrine, circulatory, and cardiovascular diseases.[101] Some suggest that increased rates of obesity in Aboriginal populations may be linked to changes in lifestyle that occurred post-colonization.[24] The traditional lifestyle of Aboriginal peoples included hunting, fishing, and agricultural farming for the procurement of food, which was physically demanding.[24] Currently, the use of store-bought foods, automobiles, and other energy-saving devices has replaced some traditional activities.[24] As a result of the potential to improve overall health through physical activity and nutrition, several programs aimed to promote healthy lifestyles in Aboriginal communities.

Recognizing that healthy nutrition begins in infancy, the community of Walpole Island developed a program to support disadvantaged children from birth to age four years by encouraging mothers to follow current infant feeding recommendations, such as breastfeeding and refraining from introducing solid foods until six months of age (Table 33).[93] The program was developed as part of The Better Beginnings, Better Futures project: a multidisciplinary longitudinal project geared towards improving the health of First Nations communities in Southwestern Ontario.[93] This project took a community development approach and provided funding to communities helping them to develop programs for infants and preschool children.[93]

As a result of the Walpole Island program, the breastfeeding initiation rate was 75% compared to 54% in other First Nations communities and 87% in the Province of Ontario. Other outcomes, such as age at introduction to solids and the proportion of two-year olds above the 85th percentile for body mass index, were not improved compared to non-participating First Nations communities. Despite the differences rate of breastfeeding, this program was identified as a least promising practice due to limited cultural sensitivity and alignment, low scientific rigour, lack of a program logic model or theory, and poor reach. However, this program quantifies the extent of work needed to enhance the health of First Nations children.

**Table 33.** Detailed description of the Kuperberg, K., & Evers, S. study.[93]

| | |
|---|---|
| **Program Name** | *Better Beginnings Better Futures* |
| **Description** | A program to encourage mothers to follow infant feeding recommendations. This is one part of the larger initiative titled "Better Beginnings, Better Futures" that aimed to improve the health of First Nation populations in southwest Ontario. The initiative adopted a community development approach to preventing health and social problems in economically disadvantaged communities in Ontario. |
| **Population** | First Nations – Ojibwas, Potawatom and Ottawa bands |
| **Location** | Walpole Island, Ontario, Canada |
| **Study Methods** | Quantitative, Observational without Control Group |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 102 |
| **Key Finding(s)** | **Healthy Lifestyle Promotion**<br>Although no differences between participant and control communities were identified in some outcomes (age at introduction to solids, proportion of two-year olds with a BMI greater than the 85 percentile), the rate of breastfeeding initiation was significantly higher among participant communities. |
| **Contributors** | Contextual, Cultural |
| **Mechanisms** | Supportive, Promotive |

In an effort to improve outcomes in older children, a Canadian program implemented health promotion programs for Aboriginal youth empowering health promotion of recreation and physical activity in two communities in British Columbia (Table 34). The goal of the research was to identify factors that would improve well-being of Aboriginal children and youth between the ages of six and 13 years and to document and evaluate the community mobilization process.[99] The programs were community developed and driven based on a community needs assessment and a tailored code of ethics

developed by the community.[99] As such, the researchers and community partners identified and agreed upon common goals for both program sites and research.

The content included physical activity, sport, recreation, health promotion, and healthy lifestyles. A youth coordinator was hired, new parenting workshops were held, a new playground was built in one of the communities, coaching clinics were held along with community meetings, and new team and individual sport experiences were provided. As a result of the programming, community members and youth demonstrated increased awareness of the benefits of physical activity, sports, and recreation.[99] Barriers to success were identified through the qualitative evaluation data and included low self esteem among some community members, no male volunteers, few role models, lack of encouragement, motivation, and consistency, exclusion, and addiction issues. However, both communities identified that they were empowered through the applicability of the program to their communities, cultures, and environments.[99] As well, both communities reported that the relationship between the health facilitators, educational facilitators, and communities grew as a result of more communication.[99] Given the strong relationships between the research partners and the community, as well as the high levels of capacity building, the intervention could serve as an example for promoting cultural sensitivity and alignment. Despite this, the program was ranked as a less promising practice in this review due to low scientific appraisal scores and limited reach, which lowered the program's potential for population level impact. Further, it is understandable that biophysical measures were not changed through this intervention given its broad focus and multifaceted approach as opposed to a more focused, intensive, approach to obesity treatment that might have influenced the anthropometric and biological quantitative measures.

**Table 34.** Detailed description of the Reading, J., Ritchie, A., Victor, J., et al. study.[99]

| | |
|---|---|
| **Description** | This is a 3-year community based program funded by the British Columbia Health Research Foundation in two dissimilar Aboriginal communities for the purposes of investigating/identifying factors that contribute to the improved health and well-being of Aboriginal children and youth aged 6-13 through sport and recreational programs.<br>As this is a community-based program it was imperative that the communities have a sense of ownership over the program design and implementation. |
| **Population** | Aboriginal |
| **Location** | British Columbia, Canada |
| **Study Methods** | Mixed Methods |
| **Scientific Appraisal** | Quantitative: Low; Qualitative: Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 57 |
| **Key Finding(s)** | **Healthy Lifestyle Promotion**<br>Although there was no improvement in obesity rates and blood pressure significantly increased throughout the study time period, community members and youth had an increased awareness of the benefits of physical activity, sports, and recreation. |
| **Contributors** | Cultural, Environmental |
| **Mechanisms** | Promotive, Supportive, Preventive |

Another Canadian healthy lifestyles program, the SHARE-AP ACTION program, was implemented in the Six Nation reserve in Brant County, Ontario (Table 35).[24] The SHARE-AP ACTION program is a household based intervention specifically designed to reduce energy intake, and increase physical activity, among Aboriginal families by providing regular home visits with trained Aboriginal health counselors.[24] As a result of the program, consumption of fatty foods, oils, snacks, and sodas was reduced and water consumption increased.[24] However, consumption of fruits and vegetables as well as physical activity did not improve with the program.[24] Environmental barriers may have contributed to the limited impact of the program.[24] Indeed, lack of fresh produce distributors on the reserves, partnered with high costs of produce, as well as the shorter shelf life of these foods, may contribute to the low uptake of produce consumption.[24] Similarly, limited and inconvenient access to bicycle paths or sidewalks may limit physical activity. As such, those planning future interventions need to consider removing barriers to make it easier for families to adopt healthier lifestyles. Despite these limitations, the program did show promise in some aspects of promoting healthy lifestyles and did demonstrate high cultural sensitivity and alignment by introducing an intervention at a family rather than individual level and developing the intervention in consultation with the community. The authors' use of strong research methods resulted in this study scoring in the mid range for scientific appraisal. Given these strengths, coupled with the program's high uptake and solid program logic model, the program was ranked as promising in this review.

**Table 35.** Detailed description of the Anand, S., Davis, A. D., Ahmed, R., et al. study.[24]

| | |
|---|---|
| **Program Name** | *The SHARE-AP ACTION* |
| **Description** | This is a household based intervention designed to reduce energy intake and increase physical activity among Aboriginal families. This intervention consisted of a regular home visit by Aboriginal health counsellors who were trained to assess and set dietary and physical activity goals for each household member. |
| **Population** | Aboriginal |
| **Location** | Brant County, Ontario, Canada |
| **Study Methods** | Quantitative, Experimental Study (i.e. RCT with concealed allocation) |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | High |
| **Final Sample Size** | 174 |
| **Key Finding(s)** | **Healthy Lifestyle Promotion**<br>Consumption of fatty foods, oils, snacks, and sodas was reduced and water consumption increased among participants. However, consumption of fruits and vegetables as well as physical activity did not improve with the program and may be attributable to environmental barriers to participation. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Promotive, Preventive, Supportive |

In keeping with recommendations to address environmental and structural barriers to health, the *Our Games, Our Health* was developed as a community-based program for Indigenous schools that incorporated 12 traditional games into the daily physical education and cultural curricula at two schools (Table 36).[97] To assess the impact of the program and improve it, process evaluations were periodically conducted using questionnaires and focus groups.[97] The program showed promise as evidenced by community uptake, however additional evaluation is needed to determine the program's

impact on health outcomes, including physical activity and obesity.[97] Despite scoring low on scientific rigour due to limited information, especially with regard to sampling; program uptake suggests that the community is supportive of the program. This program "was underpinned by the holistic context in which Indigenous communities view health, one centered on connectedness at three levels—family, community and society—and emphasized the centrality of relationships (p.104)."[97] As such, this study scored in the mid range for cultural sensitivity and alignment and was considered promising in terms of program development.

**Table 36.** Detailed description of the Parker, E., Meilkejohn, B., Edwards, K., et al. study.[97]

| | |
|---|---|
| **Program Name** | *Our Games, Our Health* |
| **Description** | A community-based health promotion initiative that focused on enhancing physical activity in two Queensland Indigenous communities by introducing traditional games into schools and community groups. |
| **Population** | Indigenous |
| **Location** | Queensland—Stradbroke Island & Cherbourg, Australia |
| **Study Methods** | Qualitative |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | >200 |
| **Key Finding(s)** | **Healthy Lifestyle Promotion**<br>The inclusion of 12 traditional games into school physical activity and cultural curricula showed community uptake. Additional evaluation is needed to assess the impact on health outcomes. |
| **Contributors** | Contextual, Environmental, Spiritual |
| **Mechanisms** | Promotive, Supportive, Preventive |

Lack of physical activity and obesity is associated with Type 2 diabetes mellitus within Aboriginal communities.[26] The next three programs were each designed to prevent risk factors for the development of diabetes. All were located in Canada and used multifaceted approaches.

The Zhiiwaapenewin Akino'maagewin: Teaching to Prevent Diabetes (ZATPD) community based diabetes prevention program aimed to modify risk factors such as sedentary lifestyle and obesity in an effort to reduce diabetes (Table 37).[26] The intervention was implemented in multiple settings including schools, food stores, and health offices using a staged approach.[26] The school phase consisted of a year-long curriculum for grades three and four that used story-telling and participatory activities to encourage healthier eating habits, promote physical activity, and educate students about diabetes.[26] In the food store component, storeowners were encouraged to stock healthier food choices, and to work with the program planners on how to effectively utilize shelf labels in order to identify promoted foods, in conjunction with displaying educational posters throughout the store.[26] Finally the health and social services phase of this program was designed to promote community events and workshops intended for integration with existing ongoing Health and Social Services activities.[26]

The report reviewed for this synthesis was a process evaluation used to modify the program and included an examination of intervention fidelity (i.e. the quality of program delivery and extent to which it is delivered as planned), reach and dose, as well as

feasibility, acceptability, and sustainability. The community identified that the program was relevant and culturally acceptable.[26] The school phase produced moderate fidelity of 63%, with the store component also showing moderate fidelity (i.e. the availability of all promoted foods was 70% and appropriate shelf labels were posted 60% of the time) and the health and social services aspect showing good usage of radio, television, and print media to promote the program.[26] Barriers to uptake and multiple suggestions for improvement were identified. Scientifically, this study ranked low as information was not available to assess the risk of selection bias and confounding factors and participation rates were unclear. The qualitative component of this study scored in the mid range, consistent with a process evaluation and reported outcomes of interest. This study scored in the mid range for cultural sensitivity and alignment as community mobilization through capacity building was the fundamental element of this undertaking and thus this program can be considered a promising practice in program development.

**Table 37.** Detailed description of the Rosecrans, A. M., Gittelsohn, J., Ho, L.S., et al. study.[26]

| | |
|---|---|
| **Program Name** | *The Zhiiwaapenewin Akino'maagewin: Teaching to Prevent Diabetes (ZATPD)* |
| **Description** | A multi-institutional community-based diabetes prevention program based in schools, food stores, and health/social services offices in seven First Nations communities in Northwestern Ontario. Project activities were divided into five phases that promoted healthier eating habits, physical activity, and diabetes education. |
| **Population** | First Nations, Native North Americans, American Indian |
| **Location** | Canada, Ontario |
| **Study Methods** | Mixed Methods |
| **Scientific Appraisal** | Quantitative, Observational Study without Control Group:<br>Quantitative: Low; Qualitative: Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 133 |
| **Key Finding(s)** | **Diabetes Healthy Lifestyle Promotion**<br>A multi-institutional community-based diabetes prevention program based in schools, food stores, and health/social services offices may facilitate the achievement of moderate levels of fidelity with regards to implementation of school curriculum (as planned), posting of food store shelf labels, posters, the availability of healthier food choices, as well as healthy cooking demonstrations/ taste tests. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Promotive, Preventive, Supportive |

The Canadian diabetes prevention program, The Kanien'keha:ka (Mohawk) Diabetes Prevention Program (KDPP), was a community-based program designed for elementary school children in grades one through six (Table 38).[25] This health education curriculum included information on Type 2 diabetes, healthy nutrition (including traditional food choices), physical activity, fitness, and other healthy lifestyle content.[25] In addition to the educational component, a community component of this program used local radio and newspaper advertisements and general press coverage to promote the intervention.[25] Policy and environmental changes supported by the KDPP included the school nutrition policy (ban of junk foods sold on or brought onto school premises) and the construction of a walking/ cycling path in the community.[25] Despite promising policy changes as a result of the intervention, the eight-year follow up to this program identified that early

reported positive results for reducing risk factors associated with diabetes such as skin fold thickness, the moderate increase of physical activity, fitness and reduction of television watching were not sustained.[25] The evaluation of the program ranked low in scientific rigor due in part to limited information regarding selection bias. The program had mid range cultural appraisal score, with a strong focus on capacity building. Although the program's evaluation did not indicate a sustained positive impact and thus was ranked as less promising, there may be an opportunity to continue to develop and evaluate the program over time to further assess its potential for population level impact.

**Table 38.** Detailed description of the Paridis, G., Levesque, L. et al. study.[25]

| | |
|---|---|
| **Program Name** | *The Kanien'keha:ka (Mohawk) Diabetes Prevention Program (KDPP)* |
| **Description** | A community-based diabetes prevention program designed for elementary school- aged children in grades one through six. This program had three components: a health education curriculum component, a policy/environmental component (school nutrition policy and construction of a walking/cycling path), and a community component, which involved the use of local radio and newspaper advertisements and general press coverage to promote the intervention. |
| **Population** | Aboriginal, Mohawk |
| **Location** | Quebec, Canada |
| **Study Methods** | Quantitative, Cohort Study |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 2526 |
| **Key Finding(s)** | **Diabetes Healthy Lifestyle Promotion**<br>Despite promising changes to policy as a result of the intervention and early improvements in skin fold thickness, fitness, and/or diet, physical activity, and amount of television watched in an Aboriginal community, the sustainability of these improvements was not confirmed. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Promotive, Supportive, Preventive |

Also focused on addressing Type 2 diabetes, a pilot school-based healthy eating and physical activity intervention, was implemented with students in grades three through five (Table 39).[94] The purpose of this intervention was to improve the diet, food knowledge, and self-efficacy of First Nations children of the Sandy Lake reserve located northwest of Toronto, Ontario.[94] The Sandy Lake Diabetes Prevention intervention included school, peer, environmental, and home based components.[94] The curriculum (school) component taught students skills they need to make healthy eating choices, the importance of physical activity, and general diabetes education.[94] The family component provided parents and family members information about the program while the peer aspect of this intervention was geared towards students acting as role models for one another.[94] Lastly, the environmental aspect was designed to encourage schools to develop policies that ban high fat foods and snacks.[94] The program was associated with improved knowledge of the psychosocial factors related to healthy eating and dietary fiber intake.[94] Although additional evaluation is needed to identify whether the program reduces the incidence of diabetes, it shows promise by increasing information and knowledge.[94] Scoring mid for scientific rigour and high for cultural appraisal, coupled

with strong program logic and high uptake, this program is an example of a promising practice in program development.

**Table 39.** Detailed description of the Saksvig, B.I., Gittelsohn, J. et al. study. [94]

| | |
|---|---|
| **Program Name** | *The Sandy Lake Health and Diabetes Project (SLHDP)* |
| **Description** | The intervention combined an ecological model with the approaches of social cognitive theory, in addition to incorporating Native North American learning styles- all of which emphasize tradition and the use of humour. There were four main components to this project: curriculum, family, peer aspect, and the environmental. The *curriculum component* taught students how to develop the skills they need to make healthy life eating choice and the importance of physical activity in addition to diabetes education and the *family component* involved informing parents and family members about the program. The *peer aspect* was aimed at encouraging students to act as role models for one another and the *environmental* component was designed to ensure that the school developed policies banning high fat foods and snacks. |
| **Population** | First Nations, American Indian, Native North American |
| **Location** | Sandy Lakes Reserve Northwestern Toronto, Ontario, Canada |
| **Study Methods** | Quantitative, Observational Study without a Control Group |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 122 |
| **Key Finding(s)** | **Diabetes Healthy Lifestyle Promotion**<br>A diabetes prevention intervention that combines an ecological model with the approaches of social cognitive theory, in addition to Native North American learning styles, may significantly increase knowledge relating to healthy eating and intake of dietary fiber, dietary self-efficacy, and improve the (overall) diet of Native Americans. |
| **Contributors** | Contextual |
| **Mechanisms** | Promotive, Supportive, Preventive |

Highlighting the importance of healthy and active lifestyles, one study investigated if poor nutrition in Aboriginal children in New South Wales, Australia contributed to otitis media, chronic suppurative otitis media, and skin infections (Table 40).[91] Following the introduction of fresh fruits (one or two servings daily) improved hearing levels in 42% of the children and decreased mean antibiotic prescriptions were reported.[91] However, this was a preliminary study with low scientific and cultural appraisal scores. This study was considered least promising and further investigation is needed to determine the impact of nutrition supplementation on health outcomes, including otitis media.

**Table 40.** Detailed description of the Jones, R., & Smith, F. study.[91]

| | |
|---|---|
| **Description** | An investigation to determine the relation between quality of nutrition and prevalence of otitis media (middle ear infection), chronic suppurative otitis media, and skin infections in school aged children living in an Australian Aboriginal community. |
| **Population** | Rural Aboriginal |
| **Location** | New South Wales, Australia |
| **Study Methods** | Quantitative, Observational Study without Control Group |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 12 |
| **Key Finding(s)** | **Healthy Lifestyle Promotion: Auditory Health**<br>Preliminary findings suggest that powdered vitamin C and mineral supplements dissolved in apple juice, in addition to the consumption of fresh fruit once or twice per school day, may help improve children's hearing and reduce the need for prescriptions. Additional evaluation is needed to better understand opportunities for health improvement in Aboriginal children. |
| **Contributors** | Environmental, Cultural |
| **Mechanisms** | Preventive, Promotive |

The programs and activities discussed so far aimed to improve health outcomes through behaviour modification and the removal of environmental and/or structural barriers. The VERB campaign used an alternate strategy. This program aimed to spread positive messages about physical activity to children (aged nine to 13 years) and their parents with marketing strategies (Table 41).[27] The campaign contained a component specifically designed to reach African American, Hispanic, Asian, and American Indian children and parents, recognizing that though these population groups may be different, they also share similar needs or behaviours.[27] In keeping with this recognition, the messages that were targeted to each population were culturally tailored.[27] This was a marketing research paper using qualitative evaluation methods and with limited information on which to base the cultural appraisal. The paper was ranked as less promising due to lack of information for appraisal. Notwithstanding these concerns, the process evaluation found that the VERB campaign was noticed by children, youth, and their parents.[27] Overall, 74% of American Indian tweens interviewed in one city were aware of the VERB campaign, which was equivalent to the national average. Additional research will be needed to determine if this media campaign results in increased health related behaviours.

**Table 41.** Detailed description of the Huhman, M., Berkowitz, J. M., Wong, F. L., et al. study.[27]

| | |
|---|---|
| **Program Name** | *The VERB Campaign* |
| **Description** | As a marketing tool, designed to promote physical activity among the American 'tween' (9-13 year old) population, the VERB Campaign adopted a two level strategy. The first aimed to spread positive messages about physical activity to the general 'tween' audience, and the second strategy aimed to specifically reach African American, Hispanic, Asian, and American Indian youth. |
| **Population** | American Indian |
| **Location** | United States |
| **Study Methods** | Qualitative |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 123 Tweens and 41 Parents |
| **Key Finding(s)** | **Healthy Lifestyle Promotion**<br>A majority of American Indian participants interviewed were aware of the VERB Campaign, however, additional evaluation is needed to assess the impact of the campaign on health behaviours and outcomes. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Promotive |

## Oral Health

Early Childhood Caries (ECC) or tooth decay of the primary teeth is known to result "from the complex relationship between diet, oral hygiene, and cariogenic bacteria in the mouth."[22] Insufficient dental care places low income and minority populations at greater risk of dental caries.[23] The rate of dental decay in Aboriginal populations is 3 to 5 times higher than that in non-Aboriginal Canadian populations.[23] In Canada, depending on the communities studied, a range of 51% to 98% of Aboriginal preschool aged children had dental caries.[5]

Three recent studies in this review implemented and evaluated interventions to improve oral health. Each study focused on different populations, children of different ages, and used different study designs and interventions. However, each intervention included the use of fluoride varnish, which is one method of reducing tooth decay in high-risk populations.[22] All three programs that addressed oral health of Aboriginal children focused on prevention. Further, two of the three[23] also used supportive mechanisms, providing parent or caregiver counselling. These programs are working to prevent poor oral health outcomes as well as to help support parents in improving oral health practices. Further, all three programs addressed contextual and environmental contributors to health.

A blinded cohort study of 357 American Indian children aged nine to 30 months who received at least four fluoride varnish treatments showed a 35% reduction in dental caries measured as decayed, missing, filled surfaces (DMFS) compared to those who had three or fewer fluoride treatments (Table 42).[22] Low cultural sensitivity, cultural alignment, reach, and uptake added to the mid scientific rigour ranking, preventing the program from being classified as a promising practice. The positive results, however, indicate the need to pair programs such as this one with stronger research designs to evaluate impact.

**Table 42.** Detailed description of the Holve, S. study.[22]

| | |
|---|---|
| **Description** | The program provided fluoride varnish at well child care visits to children aged 9-30 months from the local 'Head Start' program in an effort to reduce early childhood caries in a high risk population. |
| **Population** | American Indian, Alaska Native |
| **Location** | United States |
| **Study Methods** | Quantitative, Observational Study without Control Group |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 187 |
| **Key Finding(s)** | **Oral Health**<br>A 35% reduction in dental caries was achieved with the application of at least four fluoride varnish treatments in comparison to children receiving three or fewer treatments |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Supportive, Promotive, Preventive |

One identified challenge to effectively implementing preventive treatment is limited access to low income and minority status populations, including Aboriginal infants and preschool children.[22] The following two Canadian studies include strategies to address this issue.

A Canadian community based two-year cluster randomized controlled trial measured the effectiveness of fluoride varnish and caregiver counselling in preventing dental caries in First Nation children aged six months to five years from 20 First Nations communities in the Sioux Lookout Zone (SLZ) (Table 43).[5] At the end of two years, fluoride varnish treatment resulted in an 18% reduction in DFMS increments for First Nation children with the incidence of caries being 1.96 times higher in the controls that received no fluoride varnish treatment, but did receive counselling.[5] Despite the low cultural appraisal score but due to the strong research design and positive outcomes this very promising study supports a community based approach to use of fluoride varnish at least twice a year combined with caregiver counselling to improve dental habits and promote oral health in preschool aged children.

**Table 43.** Detailed description of the Lawrence, H. P., Binguis, D., Douglas, J., et al. study.[5]

| | |
|---|---|
| **Description** | Teams of dental hygienists were flown to First Nations communities to provide fluoride treatments to children under 5 years. Caregivers received a pamphlet on dental health. |
| **Population** | First Nations |
| **Location** | Thunder Bay, Ontario, Canada |
| **Study Methods** | Quantitative, Experimental Study (i.e. RCT with Concealed Allocation) |
| **Scientific Appraisal** | High |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 1146 |
| **Key Finding(s)** | **Oral Health**<br>The application of fluoride varnish two to three times per year, achieved an 18% reduction in dental caries after two years in comparison to children receiving no fluoride treatments. Control participants were nearly twice as likely to experience dental caries in comparison to children receiving fluoride treatments. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Supportive, Promotive, Preventive |

Similar strategies, including fluoride treatment and caregiver counselling (in a school setting) have been developed to improve dental health of older children (Table 44).[23] This Canadian study highlighted collaborative work between a remote First Nations community and a university supported school-based oral health program designed to improve oral health and knowledge among children.[23] This study adds additional evidence in the use of fluoride varnish in conjunction with daily brushing and caregiver counselling. Prior to the intervention, it was found that only 8% of the children were cavity free compared to 32% after the three year intervention.[23] Children also were found to eat fewer sugary foods and drinks. This study is considered promising because of its high cultural appraisal reach and mid scientific appraisal ranking.

**Table 44.** Detailed description of the Macnab, A. J., Rozmus, J., Benton, D., et al. study.[23]

| | |
|---|---|
| **Description** | An ongoing community and university supported, school based, collaborative oral health program for children living in a remote First Nations community. Dental health guidance and classroom presentations were provided by pediatric residents. Daily brushings along with application with of fluoride varnish and an incentive scheme were also program components. |
| **Population** | First Nations |
| **Location** | Hartley Bay, British Columbia, Canada |
| **Study Methods** | Quantitative, Observational Study without Control Group |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | High |
| **Final Sample Size** | 40 |
| **Key Finding(s)** | **Oral Health**<br>An ongoing community and university supported, school based, collaborative oral health program may facilitate the improvement of oral health behaviours in First Nations children living in a remote community. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Supportive, Promotive, Preventive |

### Mental Health & Substance Abuse

Although mental health and substance abuse are issues for youth in the Canadian context[1], no recent Canadian studies focusing on substance abuse were identified. In the United States, more American Indian youths' (12 to 17 year olds) experiment with drugs and alcohol than non-American Indian youths, with 38.7% of American Indian adolescents reporting heavy alcohol use compared to 26.4% of White, 21.4% of Latino, 23.2% of African American, and 15.3% of Asian American youth.[102] Further, compared to 7.3% of non-American Indian youths, 13.9% of American Indian youth report using alcohol and drugs at a younger age; indeed, 14.1% of American Indian youth subsequently developed dependence on alcohol or drugs.[102] The rate of drug use of American Indian adolescents living on reserve was 20.9%, which according to the 2002 National Household Survey on Drugs Abuse is nearly twice that of the national average (11.6%).[102] These statistics demonstrate that substance use and dependence are health concerns for American Indian populations.

The Seventh Generation Program for urban American Indian youth was implemented to reduce the prevalence of alcohol consumption and delay the onset of alcohol use (Table 45).[87] The program was designed to blend mainstream prevention approaches with culturally sensitive interventions and was developed in consultation with American

Indian groups.[87] As the American Indian communities involved were diverse, an agreement was reached to identify core shared values that transcended tribal differences.[87] To evaluate the impact of this program, youths in fourth through seventh grade were assessed on their locus of control, depression, self-concept, perceived social support, decision making skills, and American Indian identity to determine whether children had been reached prior to first alcohol consumption. Children who were recruited over a three year period and participated in the program showed improvements and the most significant change occurred between the post-test and the one-year follow up. Specifically, improvements were noted in youths' alcohol beliefs, social support, locus of control and depression, indicating that there was a positive effect in the first year of the program.[87] Scientific rigour was low due to a risk for selection bias as the study was not population based and there was substantial loss to follow-up. As such, the program was identified as less promising. A stronger study design is needed to verify the extent of effectiveness of this program. The researchers noted that due to the diversity in American Indian cultures no single prevention approach may be effective for all groups.[87] This study scored mid in overall cultural appraisal and provides example of cultural sensitivity. Greater involvement of the community in delivery and maintenance could have enhanced capacity building in the community and may have had a positive impact on retention.

**Table 45.** Detailed description of the Moran, J.R. & Bussey, M. study.[87]

| | |
|---|---|
| **Program Name** | *Seventh Generation Program* |
| **Description** | An alcohol prevention program that targeted urban American Indian youth through the blending of mainstream and culturally appropriate alcohol prevention approaches.<br>Owing to its name, this program incorporated seven core cultural values within its central organizing framework: harmony, respect, generosity, courage, wisdom, humility, honesty; values that are reflected within the American Indian Medicine Wheel. |
| **Population** | American Indian children and youth in 4th to 7th grades |
| **Location** | Denver & Colorado Springs, United States |
| **Study Methods** | Quantitative, Quasi-Experimental (no randomization) |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 838 |
| **Key Finding(s)** | **Mental Health and Substance Abuse**<br>An alcohol prevention program, which blends within its approach both mainstream and culturally appropriate alcohol prevention strategies, may facilitate significant overall gains in modified locus of control, depression, and social support within the first year of intervention. |
| **Contributors** | Contextual, Environmental, Cultural |
| **Mechanisms** | Supportive, Preventive |

Another program, designed to compare skills and community based approaches to prevent substance abuse among Native American youth, measured self reported substance use (Table 46).[4, 103] Two interventions options were developed with the two intervention arms and a control group followed over time. A skills intervention engaged youths in 15-50 minute weekly sessions involving instruction, modeling, and rehearsal in cognitive-behavioural skills associated with substance abuse prevention.[4] The second intervention provided the skills based intervention but also involved the community to

further enhance community engagement.[4] Although substance use increased over time in all three groups, the increases were greater in the control group. Significantly fewer students were using smokeless tobacco, marijuana and alcohol in the skills intervention alone compared with the control group or skills and community engagement intervention arm.[4] The additional community engagement component of the intervention did not increase impact beyond that of the skills intervention component alone but did demonstrate trends in a positive direction.[4] This cluster RCT was ranked mid for scientific rigour. Self report was used but saliva was also collected (but not analyzed) to enhance veracity of youth reports. The longitudinal nature of the study, care taken to maintain intervention integrity, promising results, reach, and uptake make this a very promising practice for future consideration.

**Table 46.** Detailed description of the Schinke, S.P., Tepavac, L., Cole, K.C. study.[4]

| | |
|---|---|
| **Description** | A community and skills based substance abuse prevention intervention for Native American youth. Youth in grades three to five in 27 elementary schools in five states. One intervention group taught cognitive and behavioural skills for substance abuse prevention and the other, in addition to learning cognitive and behavioural skills, engaged the community to prevent substance abuse in their youth |
| **Population** | Native American |
| **Location** | North/South Dakota, Idaho, Montana, Oklahoma, United States |
| **Study Methods** | Quantitative, Experimental Study (i.e. RCT with concealed allocation) |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 1199 |
| **Key Finding(s)** | **Mental Health and Substance Abuse**<br>Although substance use increased in all groups, both intervention groups demonstrated less alcohol and drug use compared to the control group. Of note, community engagement did not improve the outcomes beyond that of the skills-based intervention. |
| **Contributors** | Contextual, Environmental, Cultural |
| **Mechanisms** | Rehabilitative, Preventive |

A role for Indigenous Health Workers in the Mental Health Alcohol Tobacco and Other Drugs Service (MHATODS) was developed to address the mental health service needs of youth in detention centers (Table 47).[90] As such, the aim of this study was to assess effectiveness of the role of an Indigenous Health Worker within the MHATODS program.[90] The MHATODS Indigenous Health Worker collaborated with a multidisciplinary group consisting of a clinical supervisor, a senior allied health professional, and a senior Indigenous officer to engage youth in treatment.[90] Results indicate that referrals for Indigenous youth increased and there was no longer a difference in referral rates between Indigenous and non-Indigenous youth, which had been the case before the Health Workers were introduced.[90] Despite these findings, it was noted that although referral services have reportedly achieved equity, actual service use between members of these two groups has yet to reach equity.[90] The authors suggest that despite the presence of an Indigenous staff member, strategies may still fail to reflect culturally appropriate ways to address mental health problems. The authors also describe the challenges of introducing a non-professional staff member who faced personal challenges in dealing with the emotional needs of very vulnerable youth. They provide useful suggestions for those wishing to implement such

a role. The limited positive outcomes as well as the concerns expressed by the authors reflect the lack of capacity building and cultural alignment in the program. The program was identified as less promising from a population health perspective for a number of reasons. A community base for the program with strategies developed jointly with the Indigenous community was missing, indicating lack of cultural safety in this program. In addition, there was no conceptual framework and uptake in the program was limited.

**Table 47.** Detailed description of the Stathis, S., Letters, P., Dacre, E., et al. study.[90]

| | |
|---|---|
| **Program Name** | *The Indigenous Health Workers in the Mental Health Alcohol Tobacco and Other Drugs Service (MHATODS)* |
| **Description** | A program developed to ensure that mental health services offered by an Australian youth detention center were equally accessible to all detained youth. The Indigenous Health Worker's primary role was to work collaboratively with a multidisciplinary team to promote referrals of Indigenous youth to the MHATODS program. Their culturally sensitive approach involved the incorporation of traditional Indigenous worldviews of community work, respect, support and the development of knowledge through shared engagement. |
| **Population** | Indigenous, Aboriginal, Torres Strait Islander |
| **Location** | Queensland, Australia |
| **Study Methods** | Quantitative, Observational Study without Control Group |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 527 |
| **Key Finding(s)** | **Mental Health & Substance Abuse**<br>Indigenous health workers may be effective in increasing the number of referrals for additional services made for Indigenous youth, however, the use of these services is still disparate between Indigenous and non-Indigenous youth. |
| **Contributors** | Contextual, Environmental, Cultural |
| **Mechanisms** | Rehabilitative, Supportive |

### Immunization

Contributing factors to low immunization rates for Indigenous populations include access to care, distrust of medical community, and lack of discernable knowledge about immunizations.[95, 96] Two reports of vaccine coverage following the 1991 introduction of statewide (Alaskan) universal infant immunization for *H. influenza* disease report dramatic decrease in invasive *H. influenza* type b disease.[95, 96] The older study identified the potential impact that different vaccine formulations can have on disease rates,[95] while the second more recent study[96] indicated that there was continued inequity in disease rates and that *H. influenza* among rural Alaska Native children less than five years of age remain five times higher than the rate of non-Alaska Native children (Table 48).[96] The authors indicate that the continued disparity may be attributed to environmental and household factors.[96] This study demonstrates the success of mass immunization programs but also identifies the need for further study to address health disparities. Involving Indigenous communities to better understand life circumstances to work collaboratively in exploring reasons for disparity and in the introduction of programs or activities could potentially improve results. The low scores on cultural sensitivity, service delivery, and capacity building, suggest that there was a missed opportunity to provide culturally safe immunization services and further work will be needed to address cultural sensitivity in their programming.

**Table 48.** Detailed description of the Singleton, R., Bulkow, L.R., et al. [95] and Singleton, R., Hammitt, T., et al.[96] studies

| | |
|---|---|
| **Description** | The purpose of these studies were to describe the challenges encountered in controlling for *H influenza* type b disease in Alaska in addition to updating the current status of *H influenzae* disease and carriage in Alaska.<br>Data was reviewed from 1980-2004 state wide H influenzae disease surveillance. Vaccine coverage data was based on audits from tribal facilities and the National Immunization Survery. Data on *H influenzae* was based on six carriage studies. |
| **Population** | American Indian, Alaska Native, Indigenous, Aleut, Athabascan, Haida, Tlingit, Tsimpsian |
| **Location** | Alaska, United States |
| **Study Methods** | Quantitative, Observational Study without Controls |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 221,846 |
| **Key Finding(s)** | **Immunization**<br>After universal Hib vaccination, the incidence of invasive Hib disease declined dramatically in Native Alaskan children, however, rates remain higher in Alaska Native children compared to Native children living elsewhere. Prevalence of Hib disease in this population may be influenced by population characteristics, type of Hib vaccine used, and the environment. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Preventive |

An evaluation of the Targeted Immunization Program for Australian Aboriginal and Torres Strait Islander infants residing in urban settings found structural barriers to vaccination (Table 49).[88] Lack of consistent identification of Aboriginal infants in urban health clinics led to unidentified children missing immunizations.[88] As such, in Australia, it appears that status identification in urban centers is a necessary step in increasing rates of immunization among Aboriginal infants and children. Despite an improvement in immunization rates, following introduction of the program, the coverage remained lower than in the non-Aboriginal population. As well, there was considerable missing information in the article and low rankings for scientific rigour and cultural sensitivity, thus this program was considered least promising from a population health perspective

**Table 49.** Detailed description of the Thomas, P., Joseph, T., Menzies, R. study.[88]

| | |
|---|---|
| **Program Name** | *Targeted Immunization Program* |
| **Description** | An information and education strategy aimed at service providers and parents was designed to identify infants needing vaccination. Personal contact, stickers, parent brochures and posters were used to increase awareness of the need for, and lack of cost of, immunization for Aboriginal infants. |
| **Population** | Aboriginal, Torres Strait Islander |
| **Location** | New South Wales, Australia |
| **Study Methods** | Mixed Methods |
| **Scientific Appraisal** | Quantitative, Observational Study without Control Group: Low; Qualitative: is included in the Maternal Reproductive and Newborn section of this report. |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | Final sample not reported |
| **Key Finding(s)** | **Immunization**<br>A targeted immunization program may support vaccination of urban-Aboriginal children through identification of Aboriginal infants. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Preventive |

## Education

There is much history associated with residential schools for Aboriginal children in North America. Abuse and other poor practices are well documented.[104, 105] However, as can be seen from the following report, some residential schools still exist in America today. These schools were designed for school age children from areas where schools were unavailable or for whom parents had lost custody.

This evaluation report is of five residential schools currently operating in the United States (Table 50). The evaluation was designed as a participatory action or field study project to address issues for reform, identified from the evaluation as a result of the infusion of additional funding to support the schools.[98] Each school had unique characteristics and used varied approaches to meet children's needs. Retention of students in the school was an issue and considered the primary outcome of interest. The two sites with the highest retention were found to have addressed family situations and life stressors, believed in student's ability to do well, utilized grass roots problem solving to optimize environments, and used feedback to address change.[98] One of the sites with highest retention did not allow students to return home until the Christmas break for the fall semester, and summer for the winter/spring semester.[98] One site with poor retention was noted to have the highest staff to student ratio but provided little supervision for children after school and on weekends.[98] In addition, that site also had the highest use of medication following admission to the school, use of detention, and use of solitary confinement.[98] The schools that used the pre-evaluation baseline data and problem solved by changing systems to improve student experiences, also had some success in other measures such as fewer students with feelings of alienation, more students identifying positive school bonding experiences, and more students increasing their academic achievement.[98] All of the schools incorporated Native American traditions such as games, drumming, dancing, clothing, and learning traditional languages.[98] There were no differences across the schools in cultural pride.[98] Staff questionnaires and interviews revealed that the use of language and gestures created difficulties with interpretation and meaning between Native American and Anglo

individuals and across different Native American cultures.[98] In addition, there were religious tensions and some staff tension related to Native American and Anglo cultural background.[98] Qualitative comments demonstrating positive and negative activities are potentially informative to those working with Native American youth in school environments. Some schools used the evaluation to make changes that enhanced the school environment and student experiences.[98] Some of the practices used by the various schools such as highly medicating students, consistently using solitary confinement, and keeping children from returning to their families at school breaks, were of concern. Comparability of students across schools was not confirmed and testing of outcomes was in some schools longitudinal and in others a mix of cross sectional and longitudinal approaches. Therefore, there is a strong risk for selection bias. Although the evaluation was comprehensive, a stronger research design would be needed to confirm the differences identified across programs and thus the residential school programs were considered least promising.

**Table 50.** Detailed description of the DeJong, J. & Hall, P. study.[98]

| | |
|---|---|
| **Description** | Five different residential school programs were compared and contrasted to examine a number of outcomes following increased funding. The characteristics of schools that scored highest on various measures were described as best practices. |
| **Population** | Native American |
| **Location** | United States |
| **Study Methods** | Mixed Methods |
| **Scientific Appraisal** | Low |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | Five schools |
| **Key Finding(s)** | **Education**<br>This study was a cross-site evaluation of retention in American Indian boarding schools |
| **Contributors** | Environmental, Contextual |
| **Mechanisms** | Preventive, Supportive |

In synergy with a broader definition of 'health', education and literacy programs provide opportunities to support non-medical determinants of health. Aboriginal cultures value language as a mode to transmit culture and heritage; indeed, language plays an integral role in its ability to foster a sense of self and identity.[106] In keeping with this, literacy in the English language is equally important as Aboriginal populations reside in countries where English is the standard language by which services, such as healthcare, are offered.[106] For this reason, early cognitive-based training, most specifically "community education and literacy, are important elements in the provision of primary health care".[107]

In comparison to the general non-Aboriginal population, Aboriginal children tend to fall behind in their reading development.[89] According to the literature, "effective approaches to ameliorate children's chronic weaknesses in reading are limited".[89] In an effort to address this gap, a study with First Nations third grade children in Canada, identified as poor readers, was conducted to evaluate the efficacy of a holistic, cognitive based reading remediation program (COGENT) (Table 51).[89] A total of 45 students in a reservation school (two classrooms) participated in the project. One group received the

COGENT throughout the entire school year while the second group received the COGENT for the first half of the year and was followed by a pull-out cognitive-based reading enhancement program (PREP).[89] A no risk control group was also assessed. In addition to receiving cognitive assessments, students were tested on their phonological awareness, rapid naming skills, and reading skills.[89] The pre-post test results indicate that even the weakest readers improved. For the COGENT study group, there was a significant reduction in the proportion of children who were performing at or below the 10th percentile on reading measures.[89] Improvement rates per hours of instruction were better than standard benchmarks.[89] The authors attribute this to the method and the use of repetition, which may have reduced the detrimental impact of school absenteeism. Despite the narrow reach of this program it has promise for those desiring to improve Aboriginal children's academic performance due to its strong cultural sensitivity and study outcomes.

**Table 51.** Detailed description of the Hayward, D., Das, J. P., Janzen, T. study.[89]

| | |
|---|---|
| **Program Name** | *COGENT & PREP* |
| **Description** | Programs aimed at improving reading skills, through cognitive enhancement, in a western First Nations community. COGENT was designed to integrate direct instruction in prerequisite reading skills with cognitive processing strategies. In short, this program's aim was to accelerate the mental development of children and to ensure that what was learned in one situation could be generalized and transferred to a novel situation. The PREP program was designed to improve information processing strategies in addition to simultaneous and successive processing. |
| **Population** | First Nations |
| **Location** | Canada |
| **Study Methods** | Quantitative, Quasi-Experimental Design (i.e. no randomization) |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Mid |
| **Final Sample Size** | 45 |
| **Key Finding(s)** | **Education**<br>Improvement in reading skills through cognitive enhancement may have facilitated improvements in reading skills, which may have, in turn, decreased the number of children who remain below the fifth and tenth percentile on selected reading measures. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Rehabilitative, Preventive |

### *Telehealth*

The continuous advancement of global technology contributes to the divide that exists between Aboriginal and non-Aboriginal populations in terms of access to knowledge, better health care, and education.[108] This 'triple divide' consisting of health, education status, and electronic engagement with a globalized world is increasingly becoming "understood as a critical opportunity to contribute to bridging the health divide" (page S45).[108] Health promotion through the use of telemedicine has become a relevant means by which to address health issues in populations residing in remote and challenging environments.[108]

To this end, a study was conducted to compare the accuracy of ear, nose, and throat (ENT) assessments made in the conventional face to face manner with assessments

made using pre-recorded information (telemedicine) in an Indigenous community in Queensland, Australia (Table 52).[21] Fifty-eight participants with a median age of six years participated in this project.[21] The initial face to face consultation with a specialist consisted of the participants' clinical history, a psychosocial background assessment, questions relating to ENT, and medical examinations.[21] Two months after the initial face to face assessment, participants were again assessed by the same specialist via pre-recorded video clips and history as documented by a community health nurse.[21] In order to compare the accuracy of assessments, a consensus panel, consisting of otolaryngologists, compared the diagnosis.[21] Findings indicated that of the 58 assessments, accuracy in diagnosis was found in 81% of the cases (47 out of 58 cases) and where differences in opinion occurred, according to the panel, four were attributed to the quality of baseline history, and seven were believed to be related to the examination.[21] With regards to clinical management and treatment, 76% were found to be identical (44 out of 58 cases) and where differences were identified, six were attributed to quality of history and seven were thought to be associated with the examination.[21] Measurement of intra-observer agreement indicated that there was an up to 10% variation in discrepancies with respect to the cases that were reviewed.[21] Overall, it was concluded that telehealth may be a viable option for isolated Indigenous communities that need specialist consultations.[21] Furthermore, this study demonstrated, with the accuracy of pre-recorded telemedicine being ~ 90% trained Indigenous health workers can be involved in image preparation for specialist consultation thus effectively working in the area of capacity building.[21]

The cultural alignment score for this program was low as capacity building was not the main focus of this study and little attention was paid to cultural implications for service delivery. This initiative was identified as less promising due to lack of reported program logic, narrow reach, and lack of cultural sensitivity. However, this study provides incentive to tackle contextual and environmental barriers to health. Capacity building could be facilitated through the use of the technology. Further study using Indigenous health workers is warranted.

**Table 52.** Detailed description of the Smith, A., Perry, C., Agnew, J., et al. study.[21]

| | |
|---|---|
| **Description** | The purpose of this study was to compare the accuracy of assessments made in the conventional face to face manner with assessments made using pre-recorded information. |
| **Population** | Indigenous |
| **Location** | Queensland, Australia |
| **Study Methods** | Quantitative, Case Control |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 58 |
| **Key Finding(s)** | **Telehealth**<br>This study involved the comparison of the accuracy of ear, nose, and throat health assessments made in a conventional face-to-face manner with those made using pre-recorded video images. Diagnostic accuracy was achieved in 81% of patients suggesting an opportunity to increase access to care. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Promotive, Supportive |

**FASD: Diagnostic Criteria**

The following article was included as it relates to the exploration of existing FASD diagnostic criteria which, for this review, was considered to be part of child well-being. The authors argued that existing FASD diagnostic criteria, as outlined by the Institute of Medicine (IOM), needed to be refined as the applied diagnostic approaches reflected findings most relevant to European populations. Thus, when applying the proposed criteria, potential population differences were not taken into account (Table 53).[92] The identified challenges faced as a result of this finding include: misdiagnosis leading to stigmatization of mothers and children, inappropriate medical treatment, and unwarranted attention from schools and social services.[92]

In order to address this identified gap in knowledge, a cohort of 1500 children who were prenatally exposed to alcohol were recruited from [92] six Native American communities in the United States, and one community in South Africa, for this five year study.[92] Families and their children underwent standardized multidisciplinary assessments consisting of: dysmorphology assessments, developmental and neuro-psychological testing in conjunction with structured maternal interviews. Content included prenatal drinking practices, demographics, and family information.[92] Analysis of the data gathered was conducted using revised IOM FASD diagnostic categories formulated on the basis of the results.[92] The revised IOM FASD diagnostic categories used in this study included the following amendments: (1) Children with FAS (with or without confirmed maternal alcohol exposure) must have abnormalities in *all domains* (i.e. facial dysmorphic features, growth, and brain growth/structure). (2) Children with partial FAS (with or without confirmed maternal alcohol exposure) must display typical facial dysmorphic features and abnormalities in *one of the other domains* (i.e. growth or central nervous system structure or function). (3)Maternal alcohol exposure must be documented for the two diagnoses characterized as alcohol related effects (i.e. ARBD, ARND).[92]

Findings indicated that the revised IOM method was accurate in its definition of the spectrum of disabilities among the children and applicable in clinical practice.[92] Scientifically, this study scored in the mid range, however, a score of zero was assigned for the cultural alignment component as this article was primarily concerned with the revision of existing IOM FASD diagnostic criteria. Despite this immediate shortcoming, the findings from this study have the potential to influence practice and the study was identified as promising. This study's contribution to knowledge resides in the authors' conclusions that, in practice, with diverse population groups, differing cultural characteristics and each child's strengths and weaknesses can be used to guide more appropriate treatment planning, which will be beneficial for diagnosis and treatment.[92]

**Table 53.** Detailed description of the Hoyme, E., May, P., Kalberg, W., et al. study.[92]

| | |
|---|---|
| **Description** | This study refined the 1996 Institute of Medicine (IOM) criteria for the diagnosis of FASD with the specific goal of facilitating their practical application in clinical pediatric medicine. |
| **Population** | Native American |
| **Location** | Montana, North Dakota, South Dakota, United States; Western Cape Province, South Africa |
| **Study Methods** | Quantitative, Case Control |
| **Scientific Appraisal** | Mid |
| **Cultural Appraisal** | Low |
| **Final Sample Size** | 1500 |
| **Key Finding(s)** | **FASD**<br>Established 1996 IOM guidelines continue to be the most appropriate diagnostic guidelines for children exposed to alcohol before birth. Specific revisions, however, may make these criteria more applicable for clinical pediatric medicine. |
| **Contributors** | Contextual, Environmental |
| **Mechanisms** | Supportive |

## Emerging Issues

### Emerging Issues in Maternal, Reproductive, Newborn and Child Health

Through the process of identifying best and promising practices, some new and emerging issues were identified. Evidence and strategies to address these identified issues are needed in future research, practice, and policy. Community and researcher consultation was also used to identify and verify emerging issues findings in Aboriginal maternal, reproductive, newborn, and child health. Nine content experts, in addition to the Aboriginal Advisory Committee of the Alberta Centre for Child, Family, and Community Research, participated in this expert consultation (Appendix A).

The three general emerging issues were identified: supporting health professionals, cultural tailoring, and challenges with evaluation of existing programs. Additional emerging issues specifically related to children's health and well-being, including: identifying Aboriginal children, child safety, and telemedicine and video technology.

#### *Supporting Health Professionals*

It was noted in the reviewed articles that health care providers lacked confidence when providing prenatal care to Aboriginal women.[19, 61, 109, 110] Aboriginal Health Workers (AHWs) expressed some hesitation in providing services other than referral and support.[61] AHWs were concerned that they would be perceived as paternalistic and that this would discourage Aboriginal patients from seeking care.[61] Validating provider concerns, additional evidence indicated that Aboriginal women were less likely to have regular antenatal checkups (average of three antenatal visits without added programming) and tended to enter antenatal care at a later stage of pregnancy than non-Aboriginals.[15, 61] Aboriginal women further reported that they had negative attitudes towards the healthcare industry and therefore ranked antenatal checkups as a low priority.[61] These findings create further impetus to better support health providers in providing culturally sensitive care.

Similar concerns were identified by physicians providing care to Aboriginal children, specifically in the diagnosis of Fetal Alcohol Spectrum Disorders (FASD). Only two percent of health professionals felt very prepared to deal with patients or parents in the area of FASD and 80% wanted additional resources for themselves and their clients on dealing with FASD.[109] Physicians were also protective of their relationships with Aboriginal parents and children.[109] Physicians were concerned about discussing women's alcohol or substance use during pregnancy because they felt it might anger women and jeopardize their relationship with the patient.[109] Despite identified concerns, physicians in Canada with a higher proportion of Aboriginal patients demonstrated positive trends in providing care.[19] These physicians were more likely to engage in preventive care by asking about risk factors associated with alcohol use before and during pregnancy and were also more likely to identify a lack of addiction treatment services and poverty as barriers to treatment for pregnant women with alcohol related problems.[19] Further, physicians treating more Aboriginal patients were more confident in their ability to provide care for patients with alcohol issues and were more comprehensive in the manner in which they assessed fetal risk to FASD.[19]

While there has been considerable research devoted to assessing health and service disparities, research identifying the needs of health care providers in responding to Aboriginal communities and high risk populations is minimal. The limited available research identified health professionals' concerns and an opportunity to provide support. Given that physicians and other health providers are important agents of change, they require the necessary education and support in order for them to be able to practice in a manner that is reflective of the needs of the community.[19]

One initiative was identified that aimed to better support care providers in meeting the needs of their clients.[110] Australia's Maternity Emergency Care† (MEC) course was developed in response to self-identified needs from rural Aboriginal Health Workers (AHW) and Remote Area Nurses (RAN).[110] The MEC courses aimed to build skills for improved identification, referral, and management of unexpected births or maternity emergencies.[110] This initiative is significant, as 8.9% of rural dwelling Aboriginal women received inadequate prenatal care compared to their non-Aboriginal counterparts. As a result, these rural-dwelling women were predisposed to adverse pregnancy outcomes such as preterm birth and low birth weight.[36, 110] Six MEC courses were offered annually to help support RANs and AHWs and ultimately improve rural prenatal care, maternal health, and birth outcomes.[110] Though the program had not been evaluated as yet, health workers have reported satisfaction.[110]

### *Cultural Tailoring*

Because Aboriginal culture and definition of health differs from that of the mainstream culture in Canada, Australia, New Zealand, and the United States, there is concern about applying interventions that have been effective in the general population to Aboriginal populations.[111] While there is a need to maintain program integrity to support comparable outcomes, programs and activities may not be culturally appropriate without modification.[111] As such, without cultural tailoring, interventions may be limited in their uptake and effectiveness.[111] For example, in one program the testing procedures used in the assessment of alcohol consumption and diagnosis of alcoholism were based on mainstream norms and therefore categorized the behaviours of Native Americans with alcoholism as more severely deviant than is contextually accurate.[111] Given potentially misleading assessment and diagnosis, treatment may be impacted and less effective. Further highlighting the need for culturally and contextually sensitive assessment and diagnosis, a comparison of neuro-behavioural functioning between Aboriginal and Caucasian children with FASD identified different strengths and weaknesses in neuro-

† The MEC is a multidisciplinary six courses a year designed to assist RANs and AHWs "develop skills in the management of unexpected birth in isolated settings, recognize the complications of pregnancy, birth and the post-partum period" and "provide first-line emergency care for the mother and/or baby prior to transfer."[110] The MEC course consists of self-directed learning in addition to workshops that provide an overview of remote area maternity issues, neonatal resuscitation, uncommon events (i.e. breech, cord prolapse, shoulder dystocia), hypertension in pregnancy, postpartum hemorrhage, preterm labor, bleeding in pregnancy, importance of antenatal care, the unwell pregnant woman, normal birth and care of the woman.[110] In addition to these necessary medical skills, participants of this course receive training in cultural safety and its implications on birth and service provision. Through cultural safety programming, participants are provided with information about colonialism and are asked to consider the potential impacts of local versus remote deliveries for women and their families.[110]

behavioural functioning in these populations.[112] These findings suggest that, to better understand the profile of FAS, cultural differences in FASD characteristics need to be considered. This is particularly salient as additional research identified physician concerns in their capacity to effectively diagnose and treat FASD in Aboriginal children.[19, 109] As such, there may be an opportunity to better understand cultural variances in disease and wellness trends.

Native-centered interventions are defined as programs that are developed specifically for Aboriginal populations or are adaptations of existing programs (culturally tailored programs).[111] These programs incorporate elements of traditional practices, such as sacred dances, talking circles, sweat lodges with mainstream treatment methods.[111] These programs may have increased uptake and adherence from Aboriginal communities and therefore have potential to have a greater impact on health disparities. Some midwifery programs have been culturally tailored or native-centered and show promise.[2, 3, 14-16, 36, 62, 65] Further, some child directed programs are also culturally tailored and show promise.[4, 24, 94]

***Challenges with Evaluation of Existing Programs and Activities***

Lack of consistent evaluative research on health programs and activities was an ongoing and apparent concern. Indeed, only approximately 20% of the articles identified for this synthesis review described programs or activities suggesting an opportunity to further evaluate existing programs and activities using more scientifically sound approaches. In addition to increasing the number of evaluations, there may also be an opportunity to increase the compatibility of ongoing evaluations. A review of existing published evaluations on antenatal care programs for Australian Indigenous women identified only ten articles pertaining to evaluations of antenatal care programs.[113] Among these programs there were mixed findings for many outcomes, including lack of consistency in the studies' findings across all care programs. Birth outcomes, such as perinatal mortality, preterm birth, mean birth weight, and the proportion of low birth weight infants, were not found to be improved across the programs.[113] Given the diversity in study design and control groups, including pre/post testing, community interventions, the use of historical control groups, comparisons made with other Indigenous women in the area and the use of administrative data, authors struggled to determine the overall effectiveness of antenatal programming.[113] As such, there is an opportunity to identify common research or evaluative methods, outcomes and outcome measures to increase the comparability of evaluations.

Further complicating the evaluation of health programming is uncertainty about how to best align evaluation procedures with Native ways of knowing, while still maintaining the rigor of research methods.[111] While the WHO identifies access, cultural sensitivity, continuity of care, use of protocols, and education as indicators of high quality maternal health services, they also note that these standards, though valid, are not indicators for evaluation of the outcomes of services.[14] Further, there is a disparity between research-based validity and community-based capacity for research.[14] Indeed, it can be impractical or complex to implement rigorous research methodologies in a community setting.[14, 59] For example, although the Native American community is confident in the

merit and effectiveness of traditional healing methods, there is resistance for their uptake by Western providers without empirical evidence.[111] These findings suggest that consideration of alternative evaluation designs and opportunities for evidence are needed to better align with community capacity for research as well as Native ways of knowing. There may be an opportunity to include factors such as the strength of the community relationships, the presence of energetic champions, and tailoring of interventions in program evaluations.[14]

### *Identifying Aboriginal Children*

For health care providers, health prevention interventions targeted for at-risk populations are dependent on whether members of the intended population can be correctly identified.[88, 107] As such, difficulties in identifying the ethnicity of Aboriginal children may be a barrier to providing this population with important health care services. [88, 107] Furthermore, lack of ethnic information may hinder the ability to improve Aboriginal health care inequities.[88] For example, administrators of a vaccination program expressed that the inability to identify a population at 'high risk' for contracting Invasive Pneumococcal Disease may have been a barrier to administering an important preventive vaccine to a number of Indigenous or Torres Strait Islander infants.[88] Measures to improve the availability of information on ethnic status, for example, by ensuring that health care providers are diligent about recording the ethnicity of newborn infants on charts,[107, 114] may improve some health care services for Aboriginal peoples.[88] In the Canadian context, there is a need for agreement across sectors and within health to include ethnicity including Aboriginal status in health records

### *Child Safety*

Threats to the physical safety of children and youth are of particular concern to some Native American caregivers.[115] Parental concern was specifically noted regarding violence in living and recreational environments.[115] Within one American Indian community, the use of parks, recreational facilities, and "playing outside" in general was discouraged by parents because of vandalism and imminent threats to safety, such as bullies and gangs.[115] According to these parents, violence in the community was exacerbated by improper law enforcement on the part of tribal police.[115] Further, concerns regarding law enforcement within Native communities related to low use of child car seats among some American Indian and Alaska Native communities. Indeed, only 47.5% of American Indian/Alaska Native caregivers place infants in car seats compared to 98% of American caregivers.[116] Some community members attributed this to the lack of tribal and/or state law mandating their use, exacerbated by deeper issues of tribal sovereignty.[116] Community members suggest that identified threats to safety may be improved by strengthening law enforcement within affected Native communities.[116]

### *Telemedicine and Video Technology*

Telehealth is a communication technology used to deliver health services, expertise, and information across distances. For remote Aboriginal communities, this technology may enhance, expand, and support existing on-reserve health care provision, thereby increasing the quality and number of services available to Aboriginal peoples living in

isolated locations.[117] Feedback regarding the use of psychiatric telehealth services in Australia indicated that 75% of rural clinicians and 53% of urban clinicians treating patients remotely through videoconferencing considered the service to be 'effective' or 'very effective' as a clinical tool.[118] For American Indians living in remote communities, telepsychiatry services are reportedly also showing potential in improving the mental health of some members.[119] Other uses of video technology, for example the use of pre-recorded video images for the assessment of rural Aboriginal Australian children with ear, nose, and throat conditions,[21] may show potential in early detection and subsequent monitoring of children at high risk for developing chronic diseases that cause hearing loss.[21] Given the importance of community and family in Aboriginal cultures,[117] video technology may also be used to connect family members who have been evacuated for health treatment.[117] In light of the cultural heterogeneity among Aboriginal populations, specifically regarding the use of telehealth services,[87, 97, 117, 120, 121] the applicability of telehealth services for the Aboriginal population warrants additional consideration and evaluation.

## General Discussion

Several important concepts identified through this synthesis review nformed our conclusions, implications, and suggestions for future directions. While there is a lack of intervention research, Aboriginal health inequalities have been well-studied and as such there is need for informed and strategic research in the future to ensure that the efforts of communities are rewarded with improved health outcomes.

### Understanding Risk

As previously described (see Background), Aboriginal populations have a different worldview from mainstream culture, which shapes how individuals understand health.[122] Use of a Holistic Health Model, with representation through an Aboriginal Medicine Wheel such as the one used in Figure 1, might enhance understanding for non–Aboriginal individuals. The Medicine Wheel demonstrates that health extends beyond the biomedical model[41] and includes spiritual, environmental, cultural, political, and contextual contributors to health and well-being. Further, the model identifies a role for the individual, family, and larger community in achieving a state of 'health' using preventive, rehabilitative, supportive, promotive, and curative mechanisms. 'Good health' is considered to be a balance of physical, mental, emotional, and spiritual elements.[123] Aboriginal peoples' conceptualization of health is complex. Of note, despite diversity among Aboriginal populations, groups are similar in their holistic approach to health,[48] but may not subscribe specifically to the Medicine Wheel conceptualization used in this synthesis review.

> Good health is a balance of physical, mental, emotional and spiritual elements. All four interact for a strong healthy person. If we neglect one, we get out of balance and our health suffers in all areas. Good health is achieved when we live in a balanced relationship with the earth and the natural world. Everything we need is provided by our common mother, earth; whole foods, pure water and air, medicines, and the laws and teachings which show how to use things wisely. Combined with an active lifestyle, a positive attitude, and peaceful and harmonious relations with people and the spiritual world, good health will be ours" (Page 2).[57]

The biomedical model is perceived as service oriented, prescriptive, and pathologic, creating a disconnect between Aboriginal perspectives and mainstream services.[48, 122, 124-126] Further, because there are different models of health, there is a different understanding of what constitutes 'risk' that shapes health decisions, who should make health related decisions, how programs and activities should be developed to have the greatest impact, and how those with 'health' related issues are viewed.

### Medicalization of Maternal Health & Childbirth

In Aboriginal communities, births traditionally occurred within the community with assistance from local women and this tradition holds value to Aboriginal women and their culture.[47, 48, 122, 124, 127-130] Birthing in the community allows for the transmission of cultural teachings, fosters cultural identity, and contributes to the honing of parental

skills via the community.[129] More recently, Aboriginal women in Canada have been removed from rural locations and their local community, family, and support systems and transported to urban centres for delivery in order to reduce the risk for maternal and newborn morbidity and mortality.[2] Indeed, in the Inuit community, perinatal outcomes were improved by moving birthing to nursing stations or hospitals.[128] Although transferring women for delivery did improve perinatal outcomes, the practice has been considered culturally insensitive and attached to feelings of disempowerment.[47, 48, 122, 124, 127-131] Despite being an effort to protect mother and baby, this practice is regarded by some communities as unethical; a continuation of colonial practices[48] and a disruption in community involvement.[131] For Aboriginal communities, the decision of where to birth is a communal decision and their success is measured in the long term as reflected by the health and well-being of the entire community.[128]

Women from First Nations communities have highlighted midwifery, including local capacity building and educational programs, as a preferred solution to evacuation for prenatal care and delivery.[2] As such, it suggests that the Aboriginal model of health for some identifies greater 'risk' from the isolation of birthing in an urban centre than from potential complications locally. Currently, many communities have programs that give women with low risk pregnancies an option to birth locally or transfer to an urban centre. These programs show promise and have substantial uptake from Aboriginal women.[2, 13, 69] However, high risk pregnancies and in some communities, primiparas (first pregnancies), are not permitted to birth locally.[2, 13] Notwithstanding, women in these higher stress situations, like first time motherhood or jeopardized pregnancies, may be in need of more support from their local communities.

The practice of transporting women for delivery implies the biomedical model prioritizes physical health mother and infant over social support and emotional and spiritual health. These different understandings of 'risk' may result in different perceptions of the "best" decision for health care. While there is evidence to support both local birthing and transfer before delivery, the ultimate decision requires an understanding of the type of risk being addressed for mother and child. In this decision, differing definitions of 'risk' may lead to different decisions. As such, a discussion of risk and health decisions for these women is warranted to better understand their preferences and can move the process of decision making into a culturally safe practice environment. Cultural safety occurs when health care providers respect the health decisions of the client/patient following an informed discussion of their respective perspectives on health related risks.[132]

**Family and Community Involvement in Health**

*"It takes a village to raise a child."- African proverb*

The First Nations model of health and well-being places importance on family and community (Figure 1). Indeed, the Medicine Wheel model places community at the core, with all other elements of, and contributors to, health surrounding this foundation.[48, 122] In Aboriginal communities, an individual's well-being is dependent on the group's well-being, thus, suggesting that family and community health contributes to the individual's

health[47, 48, 130] For Aboriginal people, 'family'[45] extends beyond those related by blood, marriage, or adoption.[133] Indeed, some American Indian elders identified that the whole community constituted 'a family'.[134] As such, when it comes to maternal and child health decisions, in practice, community and family perspectives are offered and a culturally sensitive group decision is made that is reflective of the best outcome for the child, mother, family and community.[48] Specifically regarding children, care, responsibility, and decision making within Aboriginal communities may extend beyond the biological parents/legal guardians to the extended family and community is an important notion.[45, 130] Health is a concept that does not distinguish the individual from the community; an individual's health is thus intertwined within the health of their community as a whole.[97, 135] Decisions are therefore a shared responsibility. When health care providers treat Aboriginal patients, they need to be aware that they are not only treating an individual but that their actions also reach the entire community.[135]

Evidence suggests that community and family involvement increases the likelihood of programs improving health outcomes.[97, 121, 134, 136-138] Although none of the reviewed programs aimed to, or directly measured, the impact of community involvement, consistently, researchers discussed and reported that community engagement and participation were central to program/activity impact.[97, 121, 134, 136-138] To this end, outcomes measured at the individual level may underestimate community involvement and participation. Community level evaluation may be better aligned with Aboriginal community values.[97] Further, Aboriginal communities have reported that they believe community and family focused rather than individual health interventions will have the greatest positive impact.[134] For example, an Australian program increased physical activity of youth by engaging the whole community in health improvement.[97] Others have noted that the consideration of cultural values, the cooperation of local stores, schools, and community activities, rather than an individually targeted approach, is more effective as a diabetes prevention strategy.[136] As such, the role for community in improving health outcomes suggests there may be opportunity to quantify the impact of community level interventions.

**Understanding the Historical Context of Health Disparities**

The health and well-being of Aboriginal peoples has been negatively impacted by a history of social and cultural loss as well as colonization,[102, 121, 134, 139, 140] including the loss of Native land. High rates of substance abuse and suicide[102] among Aboriginal populations have been linked to aspects of colonization, including cultural assimilation,[139] and have contributed to ongoing intergenerational pain.[121, 134] A history of colonization is thought to contribute to current health disparities in Aboriginal communities.[134]

Aboriginal populations have strived to maintain their 'cultural identity', emphasizing the importance of their culture, traditions, and values to the community;[102] as such, culture, values, and traditions may be protective against the current substance abuse problems.[120] Programs to improve health disparities within this population may be more effective when the historical context and cultural stressors in the lives of the participants are recognized.[121, 140] Although literature emphasizes the importance of acknowledging

the historical context within health interventions, what remains unclear is how existing programs have approached this and whether acknowledging the context improved outcomes, uptake, and satisfaction.[120, 140]

**One Size Does Not Fit All: The Role of Cultural Tailoring, Sensitivity, & Safety**

Health programs or activities aimed at improving health disparities within (ethnic) minority populations, may require supplementary action to address and respect the unique considerations of different cultures.[140] Specifically, Aboriginal values, traditions, as well as their social and political contexts differ from mainstream Canadian culture and therefore programs aimed at improving the health Aboriginal populations may require adaptation to be culturally sensitive.[97, 140] A substance abuse prevention program, designed to lower drug and alcohol abuse within the (youth) ethnic minority population of United States, may have improved its impact on the American Indian youth population if it were modified to be more 'culturally specific'.[140] For example, American Indian communication styles and competencies, contexts of drug use, social norms, and "cultural worldviews"[140] were not accommodated specifically enough to result in a positive effect on the health of this population's youth.[140] Indeed, overlooking these considerations may not only result in health interventions having no net positive effect, but may also result in adverse outcomes, (in this circumstance, drug use) within the Aboriginal youth population.[97, 140]

Although there are commonalities within Aboriginal populations, Aboriginal nations and communities are not 'homogeneous'.[87, 97, 102, 120, 121] Further, important environmental and structural considerations vary between communities, including urban or reserve location, quality and number of health resources, access to healthy foods, and cost of living.[87, 102, 120, 121, 140]

Given the clear differences between the Aboriginal and mainstream cultures, as well as the unique characteristics of individual Aboriginal communities, it is clear that a single intervention may not resonate with all communities; indeed, 'one size' does not fit all. As such, specific considerations, capacity building, and appropriate program 'cultural tailoring'[97] may allow the unique needs of each community to be addressed and therefore maximize the positive outcomes of health interventions.[97]

**Health Interventions and Aboriginal Youth: Empowerment, Self-Efficacy, and Determination**

Evidence suggests that Aboriginal health interventions that incorporate an opportunity for self-determination, self-efficacy, and empowerment, within a community based model, are more likely to improve health outcomes.[94, 102, 120, 121] Indeed, in Aboriginal children in Canada, a sense of self-efficacy is considered an important moderator of positive nutrition behaviours.[94] Specifically, in one study children who expressed a high amount of self efficacy were, on average, more likely to strive towards challenging goals and activities, for example, dieting and improved physical activity, leading to improved health outcomes, such as weight loss.[94]

At a community level, when Aboriginal communities self-determine solutions to social disparities and incorporate the use of native traditions, encouraging health outcomes are more likely to be achieved.[102] For example, community empowerment contributed to increased effectiveness and improved health outcomes within one substance abuse program.[94, 120] As such, health interventions that focus on community participation promote self-determination,[121] and those that change the focus of their intervention from biomedical risk factors to community strengths,[97] may create an opportunity for culturally sensitive health delivery and potentially health improvements.

**The Health & Well-being of Youth: Influence of Social and Physical Environments**

The social and physical environments in which Aboriginal peoples live play an important role in their conceptualization of 'health.'[94, 115, 137, 141, 142] American Indian tradition asserts that, to maintain good health, community members must remain in harmony with their social and physical environments.[142] Within American Indian culture, an ongoing interplay exists between the local construct of health and the social/physical environment.[115] Identifying and incorporating cultural ideas about how the Aboriginal community understands this interplay may be important when designing healthy lifestyle intervention programs aimed at reducing health disparities within this population.[115] Evidence suggests that health interventions that incorporate an ecological perspective, such as those that address the importance of positive family relations and community involvement, as well as the initiation of healthy public policies, may be beneficial at reducing nutritional health disparities within the Aboriginal youth population.[94, 115, 137, 141, 142] Instilling cooperation from local community stores to increase the availability of healthy foods in an effort to promote healthier food choices,[137] and creating healthy school environment by implementing policy changes which ban high fat and sugar snack foods (i.e., modifying environmental risk factors),[94] provides evidence to support this environmental approach to increasing healthy eating and physical activity.[94] In addition to the creation of public policies and supporting healthy community behaviour, encouraging parental support in improving youth nutritional habits and lifestyle choices, and increased physical activity,[93, 143] may support a reduction of nutritional disparities in Aboriginal youth.[115, 144]

**Defining Health**

At the onset of this report, a definition of health was provided that encompassed both biomedical and Aboriginal models of health and well-being. Throughout the process of identifying promising practices, it became clear that without first fully understanding 'health' from an Aboriginal perspective; it may not be possible to develop and implement 'health' interventions or reduce 'health disparities'. As such, to conclude the report, we'd like to highlight again the Aboriginal model of health and consider how to best incorporate this into the biomedical healthcare system.

Native American tradition places great value on maintaining harmony between the mind, body, and spirit within the natural environment.[145] Disruptions within this relationship, are thought to create a negative imbalance, potentially leading to various "signs and symptoms"[45, 97, 142] of illness. Important cultural differences in conceptualizing 'health' lead to incongruence's between biomedical and holistic health services, including

diagnosis and treatment. While some Aboriginal-identified 'signs and symptoms' of illness may also be identified by conventional medical diagnosis, others may not[121] and vice versa. This incongruence is apparent when addressing childhood disability within American Indian culture. Unlike in biomedical culture, most tribal languages do not include a word for disability, or contain expressions conceptualizing 'disability'.[142] According to the Native American Cycle of Life, all things are connected, have a purpose, and are worthy of respect and reverence; therefore, disability is not necessarily considered 'negative'.[145] Given this belief system, when health interventions are developed using the biomedical model, with an individualistic, pathological, approach to disease,[121] health improvements may not be attained.[121, 141]

Essential components of a 'healthy' American Indian child include happiness, inquisitiveness, security, self-confidence, and love; elements that create harmony.[115] Due to the connection between health and traditional beliefs, the use of traditional healing practices is considered fundamental to maintaining this harmony.[121, 135, 145] Despite being undervalued,[121] traditional healing practices may assist children who feel disconnected from society, themselves, and nature.[145] Traditional approaches to healing mental health imbalances are based upon Aboriginal peoples' understanding of their complex physical and spiritual interaction with nature. In this capacity, Western medicine may not address all aspects of Aboriginal health, especially with regard to illnesses linked to psychosocial issues such as alcohol and drug abuse.[135] Few programs reviewed incorporated traditional approaches to addressing health and child development.

Given the complexity of health and well-being in the Aboriginal worldview, it is unclear whether the healthcare system alone can or should address 'health'. This highlights a need for intersectoral and culturally sensitive and safe approaches to health, based on collaboration.

## Limitations

The scope of studies and programs selected for review were limited due to the time frame selected. Thus studies published before 2005 that might have been considered promising practices may not have been included in this review despite our review of the reference lists of the included studies that identified earlier programs as being a promising practice. As well, due to time constraints, thesis, dissertation and systematic review databases and the grey literature were not searched and important programs contained only in those databases may be missing from this review.

This synthesis review identifies promising practices and provides an understanding of the programs and activities that have been recently studied. It builds on previous approaches and introduces a cultural appraisal and a ‘promising practices’ framework to rank the studies. Although this framework is innovative, the value of the conclusions drawn is limited by these untested methods. To provide an enhanced understanding through visual representation of the relationship between cultural appraisal scores, scientific appraisal scores and countries of study origin average scores were calculated. Due to the small sample sizes and the potential for skewed distribution of the scores, medians may have been a better measure to use. However, medians were similar to means and would not have changed our interpretations.

Best practices are presented from a population health perspective; thus, programs and activities designed to address small numbers of individuals were not generally considered ‘very promising’ practices due to their limited scope. Some publications reported pilot studies thus reach and outcome indicators were often limited. Scoring for all parameters was based on what was contained in the published reports, which due to journal word count restrictions might have been missing pertinent information that may have increased appraisal scores or the level of promise identified.

## Conclusions & Implications

1. Although there is limited actionable research in Aboriginal health, Canada has been a leader in culturally sensitive intervention research. Since health disparities continue to persist, it is important to acknowledge and build upon those efforts.
2. A variety of well-documented disparities such as unwanted pregnancy, teenage pregnancy, relationship status, infant mortality, maternal obesity, Sudden Infant Death Syndrome, injury, emotional difficulties and suicide have not been well addressed through programming.[1, 6-11]
3. Especially for low risk pregnancies, the pursuit of programs that promote culturally safe, woman and community centered care such as midwifery[2, 3, 12-17] and in particular those that train Aboriginal midwives is warrented.[2]
4. Use of peer support and Aboriginal health workers is a potentially promising way to enhance cultural sensitivity and promote culturally safe care, especially when travel for health services outside of the community is required.[15, 16, 18] The use of cultural interpreters is important as Western staff have identified a lack of confidence in addressing culturally sensitive issues with individuals and families.[19]
5. Promising practices in perinatal HIV transmission[20] could be adapted and applied in other settings coupled with strong evaluation methods.
6. In some communities there is a lack of choice for delivery location for women with first pregnancies; mandating a transfer from the community for delivery raises the ethical question of ownership of the decision. Culturally safe care allows women to make an informed decision taking into account the biomedical concept of health risk for mother and baby and the Aboriginal concept of holistic health risk for mother, baby and community. As such, a deeper understanding of self determination and variations in the definition of risk is needed.
7. For those living in highly isolated locations, delivery of health service through the use of technology could provide significant opportunities. Only one identified study used technology to assess health in Aboriginal children.[21] There is opportunity to develop and evaluate culturally safe telehealth services.
8. There is a shortage of recently published and evaluated Canadian programs to prevent substance use in Aboriginal children and youth. There is an opportunity to take the lessons learned in program development and implementation from a very promising American prevention program for elementary students[4] and to carefully adapt this program and its evaluative strategies for use in the Canadian context.
9. Use of fluoride varnish to prevent dental caries in Aboriginal communities was effective.[5, 22, 23] Additional strategies to heighten cultural alignment and sensitivity are needed.
10. Culturally aligned family, school, and community promising practices promoting healthy eating and active living provide opportunities to address the rising rates of Type 2 diabetes and obesity in Aboriginal children.[24-26]
11. A holistic cognitive reading remediation program supported grade 3 students who were most at risk for poor literacy. This study, although small in scope, presents an opportunity to enhance academic proficiency through adaptation in other communities.[27]

12. There were few studies of children living in rural settings. This represents a gap that could be addressed in planning for future programs and research.
13. Given the importance of spirituality and holistic health for Aboriginal people an opportunity exists to address the contribution of spirituality in health.
14. No practices addressed political contributors to health. There may be an opportunity to further understand these contributors and address them through culturally sensitive programming and practices.
15. In alignment with OCAP (Ownership, Control, Access, and Possession),practices that are developed, evaluated, owned or managed by communities, with feasible outcomes aligned to program objectives have a greater opportunity for success as a result of community engagement. [28]

## Key Recommendations

1. Given Aboriginal Holistic Health Models and the complexity of Aboriginal definitions of health, efforts to reduce ‘health’ disparities need to address contributors to health such as contextual, cultural, environmental, political, and spiritual factors. In the current Canadian government system, this requires intersectoral and interdisciplinary approaches to health. There is a need for collaboration between government bodies and between sectors to eliminate health disparities.
2. While there has been a great deal of research on Aboriginal health disparities, less than 5% of the identified research papers addressed actionable programs or activities. There is a need for programs and actionable research that is policy and practice relevant.
3. In conducting research within Aboriginal communities, both scientific and Aboriginal ways of knowing need to be adopted to provide evidence in both frameworks. Only one paper ranked high in both scientific rigour and cultural sensitivity and alignment. As demonstrated by this program and study, scientific rigour does not have to be a ‘trade off’ for cultural sensitivity: it is possible to have both.
4. Improved outcomes for maternal, infant, and child health must be investigated within the context of culturally desirable community capacity building. Singular focus on remediation of risk at the expense of community determination and participation detracts from sustainable improvements in health of individuals and communities.
5. Adoption/adaptation of the promising practices identified in this report along with ongoing and rigourous assessment of effectiveness will contribute the important evidence needed to achieve sustained health improvements.

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# Appendices

**Appendix A:** List of Contributing Experts

| Name | Position | Organization **Location** |
|---|---|---|
| Dr. Irena Buka | Clinical Professor, Paediatrics | University of Alberta, **Alberta, Canada** |
| Dr. Ruth Etzel | Research Director, Southcentral Foundation | Alaska Native Medical Center, **Anchorage, United States** |
| Dr. David Johnson | Professor of Paediatrics | Alberta Health Services and University of Calgary, **Alberta, Canada** |
| Dr. Jim Kellner | Head Department of Paediatrics | Alberta Health Services and University of Calgary, **Alberta, Canada** |
| Dr. Judy MacDonald | Medical Officer of Health | Alberta Health Services, Calgary, **Alberta, Canada** |
| Pam Miller | Biologist and Director | Alaska Community Action on Toxics, **Alaska, United States** |
| Dr. Jay Shore | Associate Professor | University of Colorado (Denver), **Colorado, United States** |
| Paul Spire | Manager, Division of Technical & Medical Services | American Academy of Pediatrics, **Illinois, United States** |
| Dr. Jean Starling | Head of the Department of Psychological Medicine | The Children's Hospital at Westmead, **New South Whales, Australia** |

**Appendix B:** Appraisal for Quantitative Scientific Rigour [1]

**ASSESSMENT OF QUANTITATIVE SCIENTIFIC RIGOUR**

**Selection Bias**
8 factors

- The sample was population based
- Eligibility criteria were specified
- The sample was randomly selected
- Dropout rates and reasons were reported
- Reasons for loss the same in each group
- Follow-up was for >80%
- Subjects were randomly allocated (RCT)
- There was intention to treat analysis if RCT

**Information Bias**
7 factors

- All groups assessed in the same manner
- Blinding for exposure/outcome assessment
- Blinding for caregivers
- Blinding for patients
- Concealed allocation for RCT
- Prognostic, exposure baseline assessments valid and reliable
- Outcome assessments valid and reliable

**Confounding**
3 factors

- Groups similar on prognostic factors at baseline
- Groups comparable on prognostic/confounding factors
- Confounding factors taken into consideration in analysis

'Low' scored from 0 to 5, 'Medium' scored from 6 to 11 and 'High' scored from 12-18

[1] Adapted from Flynn *et al,*[49] the Oxford Centre for Evidence Based Medicine,[55] and Zara *et al.*[56]

**Appendix C:** Appraisal for Qualitative Scientific Rigour

**QUALITATIVE SCIENTIFIC RIGOUR**[2]

**Reflexivity**
2 factors

- Investigator background/perspective are described
- Influence on study is clearly stated

**Credibility**
11 factors

*Theoretical Framework*
- Is adequate given the aims of the study
- Role in interpretation of data is clear

*Sampling*
- Approach is clearly stated and consistent with aim
- Biases in selection are articulated
- Is theoretically justified

*Data Collection*
- Activities are clearly described
- Limitations are considered

*Analysis Approach*
- Is systematic
- Is transparent
- Is consistent with the qualitative tradition and aims
- Trustworthiness of data is checked, interpretation emerges from data

**Transferability**
1 factor
- Context of the study is understandable given the description of sample characteristics and

'Low' scored 0-4, 'Medium' scored 5-9 and 'High' scored 10-14

[2] Based on Flynn *et al.*[49]

**Appendix D:** Appraisal for Cultural Sensitivity & Alignment

**CULTURAL SENSITIVITY & ALIGNMENT**[3]

**Cultural Sensitivity:** 9 factors

- The program provides training or education about Aboriginals to the staff.
- The manuscript recognizes the impact of colonization in the introduction or discussion.
- The introduction or discussion mentions or suggests recognition of the government obligations to Aboriginal peoples in Canada.
- The practice/service considers both medical/health and other determinants of health.
- The practice/service aims to improve health or well-being outcomes as a primary or secondary outcome.
- The manuscript does not make assumptions about the population, service, or need that reflects an attitude of stereotyping (Manuscripts may be sent to the Aboriginal Advisory Committee to assist in determining this)
- The manuscript differentiates between sub-populations of Aboriginal individuals OR identifies a specific sub-population of interest.
- Demographic data relevant to the program was collected and used to interpret the data and results.
- Education resources or workshops are available to the program implementers through the program.

**Cultural Alignment**

**Service Delivery:** 6 factors

- The service/practice makes an effort to address socio-demographic contributors to health (i.e., poverty, housing, mental health, education, etc.) OR these factors are discussed, indicating awareness.
- The service/practice is located in proximity to Aboriginal individuals OR if it is located further away from Aboriginal individuals, there is a built-in strategy to provide cultural support.
- The service/practice is available in at least one native language OR cultural interpreters OR language interpreters are available.
- The manuscript identifies that informed consent was obtained OR states that ethical approval was obtained (ethical approval would require informed consent.)
- Roles are identified for the participants/target individual's family OR community.
- Traditional medicine is included in the service/practice.

**Capacity Building:** 7 factors

- The program is community-based in that it is administered by the community.
- The program is community-based in that it was developed or implemented at the request of the community.
- The research was community-based in that it was conducted in the community.
- The research was community-based in that it was developed or implemented at the request of the community.
- Aboriginal individuals OR the community are involved in a leadership OR advisory capacity (i.e., design, development, implementation, evaluation.)
- Service options are available to Aboriginal individuals to select from.
- The manuscript identified a gap in service in collaboration with Aboriginals or Aboriginal communities

[3] based on the Society of Obstetrics and Gynaecologists of Canada's guidelines for working with Aboriginals.[57] and consultation with the Alberta Centre for Child, Family and Community Research's Aboriginal Advisory Committee

**Appendix E:** Promising Practices Framework

**Certainty of Effectiveness**

| | | Study Outcomes | | | |
|---|---|---|---|---|---|
| | | **Negative** | **Neutral** | **Positive** | **Unknown** |
| **Scientific Rigour Rank** | **High** | Low | Mid | High | Mid |
| | **Mid** | Low | Low | Mid | Low |
| | **Low** | Low | Low | Low | Low |

**Potential for Population Impact**

| | | Number of Program Characteristics* | | | |
|---|---|---|---|---|---|
| | | **0/3** | **1/3** | **2/3** | **3/3** |
| **Cultural Appraisal Rank** | **High** | Low | Mid | Mid | High |
| | **Mid** | Low | Low | Mid | High |
| | **Low** | Low | Low | Low | Mid |

*Program Characteristics
1) Logic: present
2) Reach: n ≥500
3) Uptake: ≥50%

**Promising Practice Ranking**

| | | Potential for Population Impact | | |
|---|---|---|---|---|
| | | **Low** | **Moderate** | **High** |
| **Certainty of Effectiveness** | **High** | Promising | *Very* Promising | *Most* Promising |
| | **Mid** | *Less* Promising | Promising | *Very* Promising |
| | **Low** | *Least* Promising | *Less* Promising | Promising |

**Appendix F:** List of Included Studies- Maternal, Reproductive, & Newborn Health

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title |
|---|---|---|
| Bookallil, M., Chalmers, E., Bell, A.[67]<br>**Australia** | 2005<br>**The International Electronic Journal of Rural and Remote Health Research, Education, Practice, and Policy** | Challenges in preventing pyelonephritis in pregnant women in Indigenous communities |
| Bowen, A., Muhajarine, N.[66]<br>**Canada** | 2006<br>**Journal of Obstetric, Gynecologic, & Neonatal Nursing** | Prevalence of Antenatal Depression in Women Enrolled in an Outreach Program in Canada |
| Chamberlain, M., Nair, R., Nimrod, C., et al.[12]<br>**Canada** | 1998<br>**Circumpolar Health** | Evaluation of a Midwifery Birthing Center in the Canadian North |
| d'Espaignet, E.T., Measey, M.L., Carnegie, M.A., Mackerras, D.[70]<br>**Australia** | 2003<br>**Journal of Pediatrics and Child Health** | Monitoring the 'strong women, strong babies, strong culture program': the first eight years |
| England, J.I.[13]<br>**Canada** | 1998<br>**Circumpolar Health** | Rankin Inlet Birthing Project: Outcome of Primipara Deliveries |
| Fenton, J., Baumeister, L., Fogarty, J.[68]<br>**United States** | 2005<br>**Family Medicine** | Active Management of the Third Stage of Labor Among American Indian Women |
| George, M.A., Masotti, P., MacLeod, S., et al.[62]<br>**Canada** | 2006<br>**Alaska Medicine** | Bridging the Research Gap: Aboriginal and academic collaboration in FASD Prevention. The Healthy Communities, Mothers, Babies Project |
| Gilles, M., Dickinson, J., Cain, A., et al.[65]<br>**Australia** | 2007<br>**Australian and New Zealand Journal of Obstetrics and Gynaecology** | Perinatal HIV transmission and pregnancy outcomes in indigenous women in Western Australia |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title |
|---|---|---|
| Houd, S., Qunujack, J., Epoo, B.[69]<br>**Canada** | 2003<br>**Circumpolar Health** | The outcome of perinatal care in Inukjuak, Nunavik, Canada 1998-2002 |
| Jan, S., Conaty, S., Hecker, R., et al[3]<br>**Australia** | 2004<br>**Journal of Health Services Research & Policy** | An holistic economic evaluation of an Aboriginal community-controlled midwifery programme in Western Sydney |
| Kreiner, M.[2]<br>**Canada** | 2009<br>**Journal of Midwifery & Women's Health** | Delivering Diversity: Newly Regulated Midwifery Returns to Manitoba, Canada, One Community at a Time |
| Louwagie, M.[60]<br>**United States** | 2008<br>**International Journal of Childbirth Education** | Spiritual Support for Native American Indian Patients |
| Mahoney, S., Malcoe, L.H.[64]<br>**United States** | 2005<br>**Birth: Issues in Perinatal Care** | Cesarean Delivery in Native American Women: Are Low Rates Explained by Practices Common to the Indian Health Service? |
| May, P.A., Miller, J.H., Goodhart, K.A., et al[18]<br>**United States** | 2007<br>**Maternal and Child Health Journal** | Enhanced Case Management to Prevent Fetal Alcohol Spectrum Disorders in Northern Plains Communities |
| Mill, J., Jackson, R., Worthington, C., et al[71]<br>**Canada** | 2008<br>**BMC Infectious Diseases** | HIV Testing and Care in Canadian Aboriginal Youth: A Community Based Mixed Methods Study |
| Panaretto, K., Lee, H., Mitchell, M., et al[14]<br>**Australia** | 2005<br>**Medical Journal of Australia** | Impact of a collaborative shared antenatal care program for urban indigenous women: a prospective cohort study |
| Panaretto, K.S., Mitchell, M.R., Anderson, L., et al.[15]<br>**Australia** | 2007<br>**The Medical Journal of Australia** | Sustainable antenatal care services in an urban Indigenous community: the Townsville experience |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title |
|---|---|---|
| Stamp, G.E., Champion, S., Anderson, G., et al.[16]<br>**Australia** | 2008<br>**The International Electronic Journal of Rural and Remote Health Research, Education, Practice, and Policy** | Aboriginal maternal and infant care workers: partners in caring for Aboriginal mothers and babies |
| Stamp, G., Champion, S., Zanet, P., et al.[17]<br>**Australia** | 2007<br>**The Spencer Gulf Rural Health School (University of Adelaide and the University of South Australia)** | Regional Family Birthing and Anangu Bibi Birthing Program: The First 50 Births |
| Wang, F., Larke, B., Gabos, S., et al.[63]<br>**Canada** | 2005<br>**Canadian Journal of Public Health** | Potential Factors that May Affect Acceptance of Routine Prenatal HIV Testing |
| Wood, L., France, K., Hunt, K., et al.[61]<br>**Australia** | 2008<br>**Social Science and Medicine** | Indigenous women and smoking during pregnancy: Knowledge, cultural contexts and barriers to cessation |

**Appendix G:** List of Excluded Studies- Maternal, Reproductive, Newborn Health

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Arabena, K.<br>**Unspecified** | 2006<br>**Health Promotion Journal of Australia** | Preachers, policies and power: the reproductive health of adolescent Aboriginal and Torres Strait Islander peoples in Australia | Position paper |
| Arbour, L., Rupps, R., MacDonald, S. et al.<br>**Canada** | 2006<br>**Alaska Medicine** | Congenital Heart Defects in Canadian Inuit: Is more folic acid making a difference | Descriptive |
| Ashby, S., Remington, P., Katcher, M.<br>**United States** | 2005<br>**Wisconsin Medical Journal** | Births to Teens in Wisconsin: Targeting High-Risk Populations | Majority of participants were under 18 years of age |
| Axelrad, D.A., Bellinger, D.R., Ryan, L.M., et al.<br>**New Zealand** | 2007<br>**Environmental Health Perspectives** | Dose-Response Relationship of Prenatal Mercury Exposure and IQ: An integrative analysis of epidemiologic data | Participants were under 18 years of age and lacked Aboriginal representation |
| Baer, H., Blum, R., Rocket, H., et al.<br>**United States** | 2005<br>**BMC Public Health** | Use of a food frequency questionnaire in American Indian and Caucasian pregnant women: a validation study | Descriptive study |
| Beasley, M.<br>**New Zealand** | 2005<br>**New Zealand Medical Journal** | Lead Poisoning due to Ingestion of Indian Herbal Remedies: A response to the case report by Roche et. al. | Case study |
| Berti, P.R., Soueida, R., Kuhnlein, H.V.<br>**Canada** | 2008<br>**International Journal of Circumpolar Health** | Dietary Assessment of Indigenous Canadian Arctic Women with a Focus on Pregnancy and Lactation | Descriptive study |
| Binns, C.W., Gilchrist, D., Woods, B., et al.<br>**Australia** | 2006<br>**Nutrition & Dietetics** | Breastfeeding by Aboriginal Mothers in Perth | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Bower, C.<br>**Australia** | 2006<br>**Congenital Abnormalities** | Primary Prevention of Neural Tube Defects with Folate in Western Australia: the value of the Western Australian birth defects registry | Descriptive study |
| Burnette, M.<br>**United States** | 2006<br>**Minority Nurse** | Closing the Health Insurance Gap: What nurses can do to help uninsured and underinsured minority patients get the care and coverage they need | Position paper |
| Cheng, Y. W., Caughey, A. B.<br>**Not Specified** | 2008<br>**Journal of Perinatology** | Gestational diabetes: diagnosis and management | Literature review |
| Chudley, A.<br>**Australia** | 2008<br>**Archives of Disease in Childhood** | Fetal alcohol spectrum disorder: counting the invisible mission impossible? | Position paper |
| Clark, T., Robinson, E., Crengle, S., et al.<br>**New Zealand** | 2006<br>**New Zealand Medical Journal** | Contraceptive use by Maori youth in New Zealand: Associated risk and protective factors | Participants were under 18 years of age |
| Cleary, E., Ludwig, S., Riese, N. et al.<br>**Canada** | 2006<br>**Canadian Journal of Diabetes** | Educational Strategies to improve screening for gestational diabetes mellitus in Aboriginal women in a remote northern community | Lacked Aboriginal representation |
| Cordero, J.<br>**United States** | 2005<br>**Pediatrics** | A Practical Clinical Approach to Diagnosis of Fetal Alcohol Spectrum Disorders: Clarification of the 1996 Institute of Medicine Criteria | Position paper (letter) |
| Couchie, C., Sanderson, S.<br>**Canada** | 2007<br>**Journal of Obstetrics and Gynecology Canada** | A Report on Best Practices for Returning Birth to Rural and Remote Aboriginal Communities | Literature review |
| Daniells, K.<br>**New Zealand** | 2007<br>**New Zealand College of Midwives Journal** | Is it time for midwives in New Zealand to review sexually transmitted infection screening in pregnancy? | Literature review/position paper |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Dargaville, P., Copnell, B.<br>**Australia** | 2006<br>**Pediatrics** | The Epidemiology of Meconium Aspiration Syndrome: Incidence, Risk Factors, Therapies, and Outcome | Participants were under 18 years of age |
| Devitt, N.<br>**United States** | 2006<br>**Birth** | Cesarean Delivery and Native American Women | Position paper (letter) |
| Douglas, VK<br>**Canada** | 2006<br>**International Journal of Circumpolar Health** | Childbirth Among the Canadian Inuit: A Review of the Clinical and Cultural Literature | Position paper/Literature review |
| Douglas, VK.<br>**Canada** | 2006<br>**Alaska Medicine** | Converging Espistemologies: Critical Issues in Canadian Inuit Childbirth and Pregnancy | Position paper/Literature review |
| Dunbar, M., Moberley, S., Nelson, S., et al.<br>**Australia** | 2007<br>**Vaccine** | Clear not simple: An approach to community consultation for a maternal pneumococcal vaccine trial among Indigenous women in the Northern Territory of Australia | Descriptive study |
| Dzakpasu, S., Kaczorowski, J., Chalmers, B. et al.<br>**Canada** | 2008<br>**Journal of Obstetrics and Gynecology Canada** | The Canadian Maternity Experiences Survey: Design and Methods | Descriptive study |
| Eades, S., Read, A., Stanley, F., et al.<br>**Australia** | 2008<br>**Journal of Paediatrics and Child Health** | Bibbulung Gnarneep ('solid kid'): Causal pathways to poor birth outcomes in an urban Aboriginal birth cohort | Lacked a programmatic/actionable component |
| Eaglestaff, M., Klug, M., Burd, L.<br>**United States** | 2006<br>**Public Health Reports** | Infant Mortality Reviews in the Aberdeen Area of the Indian Health Service: Strategies and Outcomes | Case series |
| Elliot, E.J., Payne, J., Morris, A., et al.<br>**Australia** | 2008<br>**Archives of Disease in Childhood** | Fetal Alcohol Syndrom: A Prospective National Surveillence Study | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Freak-Poll, R., Chan, A., Tucker, G., et al.<br>**Australia** | 2009<br>**Journal of Maternal-Fetal and Neonatal Medicine** | Previous Abortion and Risk of Preterm Birth: A Population Study | Descriptive study that lacked Aboriginal participant representation |
| Gaudino J. A.<br>**United States** | 2008<br>**Maternal and Child Health Journal** | Progress Towards Narrowing Health Disparities: First Steps in Sorting Out Infant Mortality Trend Improvements Among American Indians and Alaska Natives (AI/ANs) in the Pacific Northwest, 1984-1997 | Descriptive study |
| Glover, M., Manaena-Biddle, H., Waldon, J.<br>**New Zealand** | 2007<br>**Breastfeeding Review** | Influences that Affect Maori Women Breastfeeding | Descriptive study |
| Goodyear, P., Kurpad, A., Rekha, S., et al.<br>**Canada** | 2007<br>**Pediatric Nephrology** | Effects of maternal vitamin A status on kidney development: a pilot study | Lacked Aboriginal participant representation |
| Hancock, H.<br>**Australia** | 2006<br>**Evidence Based Midwifery** | Evidence Based Midwifery Practice in Australian Rural and Remote Settings: An unknown entity | Literature review |
| Heaman, M., Blanchard, J., Gupton, A., et al<br>**Canada** | 2005<br>**Paediatric and Perinatal Epidemiology** | Risk factors for spontaneous preterm birth among Aboriginal and non-Aboriginal women in Manitoba | Descriptive study |
| Heaman, M.I., Gupton, A.L., Moffatt, M.E.<br>**Canada** | 2005<br>**Journal of Obstetrics and Gynecology Canada** | Prevalence and predictors of inadequate prenatal care: a comparison of Aboriginal and non-Aboriginal women in Manitoba | Descriptive study |
| Kennare, R., Heard, A., Chan, A.<br>**Australia** | 2005<br>**Australian and New Zealand Journal of Obstetrics and Gynaecology** | Substance use during pregnancy: risk factors and obstetric and perinatal outcomes in South Australia | Descriptive study |
| Kennare, R., Tucker, G., Heard, A., et al.<br>**Australia** | 2007<br>**Obstetrics & Gynecology** | Risks of Adverse Outcomes in the Next Birth After a First Cesarean Delivery | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Kildea, S., Kruske, S., Bowell, L.<br>**Australia** | 2006<br>**Australian Journal of Rural Health** | Maternity Emergency Care: Short course in maternity emergencies for remote area health staff with no midwifery qualifications | Descriptive study |
| Kruske, S., Kildea, S., Barclay, L.<br>**Australia** | 2006<br>**Women and Birth** | Cultural safety and maternity care for Aboriginal and Torres Strait Islander Australians | Position paper/literature review |
| Kuperberg, K., Evers, S.<br>**Canada** | 2006<br>**Canadian Journal of Dietetic Practice and Research** | Feeding Patterns and Weight Among First Nation Children | Participants were under18 years of age |
| Leonard, H., Nassar, N., Bourke, J., et al.<br>**Australia** | 2007<br>**American Journal of Epidemiology** | Relation between Intrauterine Growth and Subsequent Intellectual Disability in a Ten-year Population Cohort of Children in Western Australia | Lacked a program metric/actionable component |
| Maiya, S., Sullivan, I., Allgrove, J., et al.<br>**Not Specified** | 2008<br>**Heart** | Hypocalcaemia and vitamin D deficiency: an important, but preventable, cause of life-threatening infant heart failure | Lacked Aboriginal participant representation |
| Marquand, B.<br>**United States** | 2006<br>**Minority Nurse** | Fighting the Meth Addition Epidemic in Indian Country | Descriptive study |
| Masotti, P., George, M. A., Szala-Meneok, K., et al.<br>**Canada** | 2006<br>**PLoS Medicine** | Preventing Fetal Alcohol Spectrum Disorder in Aboriginal Communities: A Methods Development Project | Descriptive study |
| McGrath, N. M., Evans, C., Holgate, A.<br>**New Zealand** | 2007<br>**Diabetic Medicine** | Post-partum follow-up of women with gestational diabetes mellitus from Northland, New Zealand | Position paper/letter |
| Moffitt, P., Vollman, A.<br>**Canada** | 2006<br>**Contemporary Nurse** | At what cost to health? Tlicho women's medical travel for childbirth | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Mohsin, M., Bauman, A.<br>**Australia** | 2005<br>**BMC Public Health** | Socio-demographic factors associated with smoking and smoking cessation among 426,344 pregnant women in New South Wales, Australia | Descriptive study |
| Newman, C., Bonar, M., Greville, H., et al.<br>**Australia** | 2007<br>AIDS | Barriers and incentives to HIV treatment uptake among Aboriginal people in Western Australia | Descriptive study |
| Oddy, W., Kickett-Tucker, C., De Maio, J., et al.<br>**Australia** | 2006<br>Australian and New Zealand Journal of Public Health | The association of infant feeding with parent-reported infections and hospitalisations in the West Australian Aboriginal Child Health Survey | Descriptive study |
| Paterson, J., Carter, S., Gao, W., et al.<br>**New Zealand** | 2008<br>**Journal of Child Psychologyand Psychiatry** | Maternal Intimate Partner Violence and Behavioural Problems Among Pacific Children Living in New Zealand | Participants were under 18 years of age |
| Payne, J., Elliot, E., Antoine, H., et al.<br>**Australia** | 2005<br>**Australian and New Zealand Journal of Public Health** | Health professionals' knowledge, practice and opinions about fetal alcohol syndrome and alcohol consumption in pregnancy | Lacked Aboriginal participant representation |
| Port, R. V., Arnold, J., Kerr, D., et al.<br>**New Zealand** | 2007<br>**Clinical Genetics** | Cultural enhancement of a clinical service to meet the needs of indigenous people; genetic service development in response to issues for New Zealand Maori | Position paper |
| Rasmussen, C., Horne, K., Witol, A.<br>**Canada** | 2006<br>**Child Neuropsychology** | Neurobehavioral Functioning in Children with Fetal Alcohol Spectrum Disorder | Participants were under 18 years of age |
| Reime, B., Tu, A., Lee, S., et al.<br>**Canada** | 2007<br>**Paediatric and Perinatal Epidemiology** | Treatment differences between Aboriginal and white infants admitted to Canadian neonatal intensive care units | Participants were under 18 years of age |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Roach, S. M., Downes, S.<br>**Australia** | 2007<br>**The International Electronic Journal of Rural and Remote Health Research, Education, Practice, and Policy** | Caring for Australia's most remote communities: obstetric services in the Indian Ocean Territories | Lacked Aboriginal participant representation |
| Rumbold, A., Cunningham, J.<br>**Australia** | 2007<br>**Maternal and Child Health Journal** | A Review of the Impact of Antenatal Care for Australian Indigenous Women and Attempts to Strengthen these Services | Literature review |
| Silva, M., McNeill, R.<br>**New Zealand** | 2008<br>**Australian and New Zealand Journal of Public Health** | Geographical access to termination of pregnancy services in New Zealand | Descriptive study |
| Sinclair, B. A., Rowan, J. A., Hainsworth, O. T.<br>**New Zealand** | 2007<br>**Australian and New Zealand Journal of Obstetrics and Gynaecology** | Macrosomic infants are not all equal | Descriptive study |
| Smith. D., Davies, B.<br>**Canada** | 2006<br>**Canadian Nurse** | Creating a New Dynamic in Aboriginal Health | Descriptive study |
| Smith, D., Edwards, N., Martens, P., et al.<br>**Canada** | 2007<br>**Canadian Journal of Public Health** | Making a Difference: A New Care Paradigm for Pregnant and Parenting Aboriginal People | Descriptive study |
| Smith, D., Varcoe, C., Edwards, N.<br>**Canada** | 2005<br>**Canadian Journal of Nursing Research** | Turning Around the Intergenerational Impact of Residential Schools on Aboriginal People: Implications for Health Policy and Practice | Descriptive study |
| Smith-Morris, C.<br>**United States** | 2005<br>**Medical Anthropology** | Diagnostic Controversy: Gestational Diabetes and the Meaning of Risk for Pima Indian Women | Literature review |
| Sobol, I., Palacios, C., Osborne, G., et al.<br>**Canada** | 2006<br>**Alaska Medicine** | Initial Management of an Outbreak of the HTLV-1 Virus in Nunavut, Canada | Position paper |
| Szlemko, W., Wood, J., Thurman, P. J.<br>**United States** | 2006<br>**The Journal of General Psychology** | Native Americans and Alcohol: Past, Present, and Future | Literature review |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Tarlier, D.S.<br>**Unspecified** | 2006<br>**University of British Columbia** | Nursing Practice, Continuity of Care, and Maternal-Infant Health Outcomes in a Remote First Nations Community | Dissertation |
| Thommasen, H.V., Klein, M.C., Mackenzie, T., et al.<br>**Canada** | 2005<br>**Journal of Rural Medicine** | Perinatal Outcomes at Bella Coola Hospital: 1940-2001 | Majority of participants were under 18 years of age |
| Tough, S., Clarke, M., Cook, J.<br>**Canada** | 2007<br>**Maternal and Child Health Journal** | Fetal Alcohol Spectrum Disorder Prevention Approaches among Canadian Physicians by Proportion of Native/Aboriginal Patients: Practices during the Preconception and Prenatal Periods | Lacked Aboriginal participant representation |
| Unspecified<br>**Australia** | 2008<br>**Australian Nursing Journal** | Indigenous child and maternal health expansion | News article |
| Unspecified<br>**Australia** | 2009<br>**Australian Nursing Journal** | Indigenous nurse home visiting program | News article |
| Van Wagner, V., RM., Epoo, B., et al.<br>**Canada** | 2007<br>**Journal of Midwifery and Women's Health** | Reclaiming Birth, Health, and Community: Midwifery in the Inuit Villages of Nunavik, Canada | Descriptive study |
| Walker, J. B., Houseman, J., Seddon, L., et al.<br>**Canada** | 2006<br>**Environmental Research** | Maternal and umbilical cord blood levels of mercury, lead, cadmium, and essential trace elements in Arctic Canada | Descriptive study |
| Wessling, S.<br>**Unspecified** | 2005<br>**Minority Nurse** | Closing the Infant Mortality Gap | News article/position paper |
| Wood, N., Warlow, M., Quinn, H., et al.<br>**Australia** | 2008<br>**Australian and New Zealand Journal of Public Health** | Establishment of a surveillance system (utilising Midwives Data Collection Systems) for monitoring the impact of hepatitis B vaccination on the population prevalence of chronic hepatitis B virus infection in Australia | Descriptive study |

**Appendix H:** List of Included Studies- Child Health

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title |
|---|---|---|
| Anand, S., Davis, A.D., Ahmed, R., et al.[24]<br>**Canada** | 2007<br>**Canadian Journal of Public Health** | A Family-based Intervention to Promote Healthy Lifestyles in an Aboriginal Community in Canada |
| DeJong, J., Hall, P.[98]<br>**United States** | 2006<br>**American Indian & Alaska Native Mental Health Research: The Journal of the National Center** | Best Practices: A Cross-site Evaluation |
| Hayward, D., Das, J.P., Janzen, T.[89]<br>**Canada** | 2007<br>**Journal of Learning Disabilities** | Innovative Programs for Improvement in Reading Through Cognitive Enhancement: A Remediation Study of Canadian First Nations Children |
| Holve, S.[22]<br>**United States** | 2008<br>**Maternal and Child Health Journal** | An Observational Study of the Association of Fluroide Varnish Applied During Well Child Visits and the Prevention of Early Childhood Caries in American Indian Children |
| Hoyme, E., May, P., Kalberg, W., et al.[92]<br>**United States** | 2005<br>**Pediatrics** | A Practical Clinical Approach to Diagnosis of Fetal Alcohol Spectrum Disorders: Clarification of the 1996 Institute of Medicine Criteria |
| Huhman, M., Berkowitz, J., Wong, F.L., et al.[27]<br>**United States** | 2008<br>**American Journal of Preventative Medicine** | The VERB Campaign's Strategy for Reaching African-American, Hispanic, Asian, and American Indian Children and Parents |
| Jones, R., Smith, F.[91]<br>**Australia** | 2006<br>**Australian Family Physician** | Are there Health Benefits from Improving Basic Nutrition in a Remote Aboriginal Community? |
| Kuperberg, K., Evers, S.[93]<br>**Canada** | 2006<br>**Canadian Journal of Dietetic Practice and Research** | Feeding Patterns and Weight Among First Nations Children |
| Lawrence, H.P., Binguis, D., Douglas, J., et al.[5]<br>**Canada** | 2008<br>**Community Dentistry and Oral Epidemiology** | A 2-year community-randomized controlled trial of fluoride varnish to prevent early childhood caries in Aboriginal children |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title |
|---|---|---|
| Macnab, A.J., Rozmus, J., Benton, D., et al.[23]<br>**Canada** | 2008<br>**The International Electronic Journal of Rural and Remote Health Research, Education, Practice, and Policy** | 3-Year results of a collaborative school-based oral health program in a remote First Nations community |
| Moran, J., Bussey, M.[87]<br>**United States** | 2007<br>**Child and Adolescent Social Work Journal** | Results of an Alcohol Prevention Program with Urban American Indian Youth |
| Paridis, G., Levesque, et al.[25]<br>**Canada** | 2005<br>**Pediatrics** | Impact of a diabetes prevention program on body size, physical activity, and diet among Kanien'keha:ka (Mohawk) children 6 to 11 years old: 8-year results from the Kahnawake schools diabetes prevention project |
| Parker, E., Meilkejohn, B., Edwards, K., et al.[97]<br>**Australia** | 2006<br>**Health Promotion Journal of Australia** | Our Games Our Health: A Cultural Asset for Promoting Health in Indigenous Communities |
| Reading, J., Ritchie, A., Victor, J., et al.[99]<br>**Canada** | 2005<br>**Promotion & Education** | Implementing Empowering Health Promotion Programmes for Aboriginal Youth in Two Distinct Communities in British Columbia, Canada |
| Rosecrans, A.M., Gittelsohn, J., Ho, L.S., et al.[26]<br>**Canada** | 2008<br>**Health Education Research** | Process evaluation of a multi-institutional community-based program for diabetes prevention among First Nations |
| Saksvig, B.I., Gittelsohn, J.[94]<br>**Canada** | 2005<br>**American Society for Nutrition** | A pilot school-based healthy eating and physical activity intervention improves diet, food knowledge, and self-efficacy for Native Canadian Children |
| Schinke, S.P., Tepavac, L., Cole, K.C.[4]<br>**United States** | 2000<br>Addictive Behaviours | Preventing substance use among Native American Youth: three-year results |
| Singleton, R., Bulkow, L.R., Levine, O.S., et al.[95]<br>**United States** | 2000<br>**The Journal of Pediatrics** | Experience with the prevention of invasive Haemophilus Influenzae type b disease by vaccination in Alaska: the impact of persistent oropharyngeal carriage |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title |
|---|---|---|
| Singleton, R., Hammitt, L., Hennessy, T., et al.[96]<br>**United States** | 2006<br>**Pediatrics** | The Alaska Haemophilus influenzae Type b Experience: Lessons in Controlling a Vaccine-Preventable Disease |
| Smith, A., Perry, C., Agnew, J., et al.[21]<br>**Australia** | 2006<br>**Journal of Telemedicine and Telecare** | Accuracy of pre-recorded video images for the assessment of rural indigenous children with ear, nose, and throat conditions |
| Stathis, S., Letters, P., Dacre, E., et al.[90]<br>**Australia** | 2007<br>**Australian e-Journal for the Advancement of Mental Health** | The role of an Indigenous Health Worker in contributing to equity of access to a mental health and substance abuse service for Indigenous young people in a youth detention centre |
| Thomas, P., Joseph, T., Menzies, R.[88]<br>**Australia** | 2008<br>**NSW Public Health Bulletin** | Evaluation of a targeted immunization program for Aboriginal and Torres Strait Islander infants in an urban setting |

**Appendix I:** List of Excluded Studies- Child Health

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Adams, A., Harvey, H., Brown, D.<br>**United States** | 2008<br>**Obesity** | Constructs of Health and Environment Inform Child Obesity Prevention in American Indian Communities | Participants were over 18 years of age |
| Anand, S.<br>**Canada** | 2003 | Study of Health Assessment and Risk Evaluation (SHARE): Obesity Prevention in Aboriginal Peoples | Descriptive study |
| Bamblett, M.<br>**Australia** | 2006<br>**Developing Practice** | Self-determination and Culture as Protective Factors for Aboriginal Children | Descriptive study |
| Bamblett, M., Lewis, P.<br>**Australia** | 2006<br>**Developing Practice** | Embedding Culture for a Positive Future for Koorie Kids | Descriptive study |
| Bartik, W., Dixon, A., Dart, K.<br>**Australia** | 2007<br>**Australasian Psychiatry** | Aboriginal child and adolescent mental health: a rural worker training model | Participants were over 18 years of age |
| Bonnici, R.<br>**Australia** | 2008<br>**Developing Practice** | Promoting Awareness of Nutritional Risk Factors Contributing to Chronic Disease in Indigenous Communities: An Outreach Model | Program presentation that lacked indicators for outcome or process |
| Bower C, de Klerk N, Hickling S, et al.<br>**Australia** | 2006<br>**Australian and New Zealand Journal of Public Health** | Assessment of the potential effect of incremental increases in folic acid intake on neural tube defects in Australia and New Zealand | Descriptive study |
| Brewster, D.<br>**Australia** | 2006<br>**Journal of Paediatrics and Child Health** | Critical appraisal of the management of severe malnutrition: Implications for Aboriginal child health in northern Australia | Literature review |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Bridge, S., Hanssens, L., Santhanam, R.<br>**Canada** | 2007<br>**Australasian Psychiatry** | Dealing with suicidal thoughts in schools: information and education directed at secondary schools | Position paper |
| Chwedyk, P.<br>**United States** | 2005<br>**Minority Nurse** | Vital Signs. Resources Available for Fighting SIDS in Native American Communities | Descriptive study |
| Clark, K., Cheers, D.<br>**Australia** | 2005<br>**Developing Practice** | Designing Evaluations that 'Fit' with Families: Getting it Right and Getting Results! | Article not available at time of review |
| Cleary, E., Ludwig, S., Riese, N., et al.<br>**Canada** | 2006<br>**Canadian Journal of Diabetes** | Educational Strategies to Improve Screening for Gestational Diabetes Mellitus in Aboriginal Women in a Remote Northern Community | Majority of participants were over 18 years of age |
| Clendon, J.<br>**New Zealand** | 2004<br>**Contemporary Nurse** | Demonstrating outcomes in a nurse-led clinic: How primary health care nurses make a difference to children and their families | Descriptive study |
| Cook, S.J.<br>**Canada** | 2005<br>**Canadian Journal of Rural Medicine** | Use of traditional Mi'kmaq medicine among patients at a First Nations community health centre | Descriptive study and a majority of participants were over 18 years of age |
| Crossman, A., Sullivan, D. A., Benin, M.<br>**United States** | 2006<br>**Social Science & Medicine** | The family environment and American adolescents' risk of obesity as young adults | Descriptive study |
| Curran S, Gittelsohn, et al.<br>**United States** | 2005<br>**Health Education Research** | Process evaluation of a store-based environmental obesity intervention on two American Indian reservations | Participants were over 18 years of age |
| Daniel, M., Green L.W., et al.<br>**Canada** | 1999<br>**Social Science & Medicine** | Effectiveness of community-directed diabetes prevention and control in a rural Aboriginal population in British Columbia, Canada | Participants were over 18 years of age |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Daniells, K.<br>**New Zealand** | 2007<br>**New Zealand College of Midwives Journal** | Is it time for midwives in New Zealand to review sexually transmitted infection screening in pregnancy? | Literature review |
| Dargaville, P., Copnell, B.<br>**Australia** | 2006<br>**Pediatrics** | The Epidemiology of Meconium Aspiration Syndrome: Incidence, Risk Factors, Therapies, and Outcome | Descriptive study |
| DeGagné, M. | 2007<br>**Australasian Psychiatry** | Toward an Aboriginal paradigm of healing: addressing the legacy of residential schools | Descriptive paper |
| Dixon, A., Yabiku, S., Okamoto, S., et al.<br>**United States** | 2007<br>**Journal of Primary Prevention** | The Efficacy of a Multicultural Prevention Intervention among Urban American Indian Youth in the Southwest U.S. | Descriptive study |
| Fiore, A.E., Wasley, A., Bell, B.P.<br>**United States** | 2006<br>**Morbidity and Mortality Weekly Report** | Prevention of Hepatitis A Through Active or Passive Immunization | Descriptive study |
| Gaudino J. A.<br>**United States** | 2008<br>**Maternal and Child Health Journal** | Progress Towards Narrowing Health Disparities: First Steps in Sorting Out Infant Mortality Trend Improvements Among American Indians and Alaska Natives (AI/ANs) in the Pacific Northwest, 1984-1997 | Majority of participants were over 18 years of age |
| Georgiou, G. K., Das, J. P., Hayward, D.<br>**Canada** | 2009<br>**Journal of Learning Disabilities** | Revisiting the "Simple View of Reading" in a Group of Children With Poor Reading Comprehension | Descriptive study |
| Gilley, B. J.<br>**United States** | 2006<br>**Culture, Health & Sexuality** | Snag bags': Adapting condoms to community values in Native American communities | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Gittelsohn J, Davis SM, et al.<br>**United States** | 2007<br>**Preventive Medicine** | Pathways: lessons learned and future directions for school-based interventions among American Indians | Descriptive study |
| Glover, M., Manaena-Biddle, H., Waldon, J.<br>**New Zealand** | 2007<br>**Breastfeeding Review** | Influences that Affect Maori Women Breastfeeding | Descriptive study |
| Gould, J.<br>**Australia** | 2008<br>**Clinical Linguistics & Phonetics** | Non-standard assessment practices in the evaluation of communication in Australian Aboriginal children | Descriptive study |
| Gruen, R., Bailie, R., Wang, Z., et al.<br>**Australia** | 2006<br>**The Lancet** | Specialist outreach to isolated and disadvantaged communities: a population-based study | Majority of participants over 18 years of age |
| Harvey-Berino J, Rourke J.<br>**United States** | 2003<br>**Obesity Research** | Obesity Prevention in Preschool Native-American Children: A Pilot Study using Home Visiting | Majority of participants were over 18 years of age |
| Hawkins, E., Cummins, L., Marlatt, G.A., et al.<br>**United States** | 2004<br>**Psychological Bulletin** | Preventing Substance Abuse in American Indian and Alaska Native Youth: Promising Strategies for Healthier Communities | Literature review |
| Henson, K.<br>**United States** | 2005<br>**Dissertation Abstracts International: Section B: The Sciences and Engineering** | Childhood obesity in the United States of America with a special focus on Native American Reservation Dwelling Youths: The Problem, the Treatments, and How Psychology Can Help | Dissertation |
| Hewer, L., Whyatt, D.<br>**Australia** | 2006<br>**Contemporary Nurse** | Improving the implementation of an early literacy program by child health nurses through addressing local training and cultural needs | Majority of participants over 18 years of age |
| Hinz, C.<br>**United States** | 2007<br>**Minority Nurse** | Fighting Diabetes Disparities in Communities of Color | Lacked Aboriginal participant representation |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Ho, LS<br>**Canada** | 2007<br>**Johns Hopkins University** | Diabetes prevention in northwest Ontario First Nations a multi-institutional program to improve diet and increase physical activity | Dissertation |
| Ho, L. S., Gittelsohn, J., Harris, S. B., et al.<br>**Canada** | 2006<br>**Health Promotion International** | Development of an integrated diabetes prevention program with First Nations in Canada | Majority of participants were over 18 years of age |
| Hunter, S.<br>**Australia** | 2008<br>**Australian Social Work** | Child Maltreatment in Remote Aboriginal Communities and the Northern Territory Emergency Response: A Complex Issue | Literature review |
| Hunter, D., Sawyer, C.<br>**United States** | 2006<br>**The Journal of Individual Psychology** | Blending Native American Spirituality with Individual Psychology in Work with Children | Literature review |
| Hunter, E., Travers, H., Gibson, J., et al.<br>**Australia** | 2007<br>**Australasian Psychiatry** | Bridging the triple divide: performance and innovative multimedia in the service of behavioural health change in remote Indigenous settings | Unable to determine age of participants |
| Hurst, S., Laird, J.<br>**United States** | 2005<br>**Section II (Chapter 6) in "Preventing Youth Violence in a Multicultural Society"** | Understanding American Indian Youth Violence and Prevention | Descriptive study |
| Kaufman, C., Desserich, J., Big Crow, C., et al.<br>**United States** | 2007<br>**Social Science & Medicine** | Culture, context, and sexual risk among Northern Plains American Indian Youth | Majority of participants were over 18 years of age |
| Lawrence, C.<br>**Australia** | 2006<br>**Developing Practice** | The Importance of Respecting Indigenous Culture | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Lawrence H.P., Romanetz M., et al.<br>**Canada** | 2004<br>**PROBE** | Effects of a community-based prenatal nutrition program on the oral health of aboriginal preschool children in Northern Ontario | Participants were over 18 years of age |
| Letourneau, R., Crump, C., Bowling, J. M.<br>**United States** | 2008<br>**Maternal and Child Health Journal** | Ride Safe: A Child Passenger Safety Program for American Indian / Alaska Native Children | Case study |
| Long, C., Downs, A. C., Gillette, B., et al.<br>**United States** | 2006<br>**Child Youth Care Forum** | Assessing Cultural Life Skills of American Indian Youth | Not about a program/intervention |
| Macaulay A.C., Harris S.B., et al.<br>**Canada** | 2003<br>**Canadian Journal of Diabetes** | Primary prevention of type 2 diabetes: experiences of 2 Aboriginal Communities in Canada | Descriptive, literature review |
| Macaulay A.C, Paradis G, et al<br>**Canada** | 1997<br>**Preventive Medicine** | The Kahnawake Schools Diabetes Prevention Project: Intervention, Evaluation, and Baseline Results of a Diabetes Primary Prevention Program with a Native Community in Canada | Did not meet date requirement |
| MacDonald, E., Bailie, R., Brewster, D., et al.<br>**Australia** | 2008<br>**BMC Public Health** | Are hygiene and public health interventions likely to improve outcomes for Australian Aboriginal children living in remote communities? A systematic review of the literature | Literature review |
| Mark, G. Y., Revilla, L. A., Tsutsumoto, T., et al.<br>**United States** | 2005<br>**Section II (Chapter 5) in "Preventing Youth Violence in a Multicultural Society"** | Youth Violence Prevention Among Asian American and Pacific Islander Youth | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Marquand, B.<br>**United States** | 2006<br>**Minority Nurse** | Fighting the Meth Addiction Epidemic in Indian Country | News article |
| Maticka-Tyndale, E.<br>**Canada** | 2008<br>**The Canadian Journal of Human Sexuality** | Sexuality and sexual health of Canadian adolescents: Yesterday, today and tomorrow | Literature review |
| May PA, Miller JH, Goodhart KA, et al.<br>**United States** | 2007<br>**Maternal Child Health Journal** | Enhanced Case Management to Prevent Fetal Alcohol Spectrum Disorders in Northern Plains Communities | Participants were over 18 years of age |
| McCarty, T., Romero-Litte, M. E., Zepeda, O.<br>**United States** | 2006<br>**The International Journal of Bilingual Education and Bilingualism** | Native American Youth Discourses on Language Shift and Retention: Ideological Cross-currents and Their Implications for Language Planning | Descriptive study and a majority of respondents were over 18 years of age |
| McMurray, A., Param, R.<br>**Australia** | 2008<br>**Contemporary Nurse** | Culture-specific care for Indigenous people: A primary health care perspective | Position paper |
| Mehrabadi, A., Craib, K. J. P., Patterson, K., et al.<br>**Canada** | 2008<br>**International Journal of Drug Policy** | The Cedar Project: A comparison of HIV-related vulnerabilities amongst young Aboriginal women surviving drug use and sex work in two Canadian Cities | Unable to determine age of participants |
| Nash, D., Nagel, R.<br>**United States** | 2005<br>**American Journal of Public Health** | Confronting Oral Health Disparities Among American Indian / Alaskan Native Children: The Pediatric Oral Health Therapist | Descriptive study |
| Nash, D., Nagel, R.<br>**Australia** | 2007<br>**Australasian Psychiatry** | Constructions and deconstructions of risk, resilience and wellbeing: a model for understanding the development of Aboriginal adolescents | Position paper |
| Nichols, L. A., Keltner, B.<br>**United States** | 2005<br>**American Indian & Alaska Native Mental Health Research: The Journal of the National Center** | Indian Family Adjustment to Children with Disabilities | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| NSW Centre for Parenting and Research<br>**Australia** | 2005<br>**Developing Practice** | Conclusions from a Literature Review on Effectiveness of Early Intervention Programs and Strategies | Literature Review |
| Oddy, W., Kickett-Tucker, C., De Maio, J., et al.<br>**Australia** | 2006<br>**Australian and New Zealand Journal of Public Health** | The association of infant feeding with parent-reported infections and hospitalizations in the West Australian Aboriginal Child Health Survey | Respondents were over 18 years of age |
| Rasmussen, C., Horne, K., Witol, A.<br>**Canada** | 2006<br>**Child Neuropsychology** | Neurobehavioral Functioning in Children with Fetal Alcohol Spectrum Disorder | Lacked Aboriginal participant representation |
| Reime, B., Tu, A., Lee, S., et al.<br>**Canada** | 2007<br>**Paediatric and Perinatal Epidemiology** | Treatment differences between Aboriginal and white infants admitted to Canadian neonatal intensive care units | Literature review |
| Rhoades, E.V., Carey, C.J., Jacobs, B.K., et al.<br>**United States** | 2008<br>**Maternal Child Health Journal** | The Health of American Indian and Alaska Native Women, Infants and Children | Position paper |
| Richardson, B.<br>**United States** | 2008<br>**Child Welfare** | Comparative Analysis of Two Community-Based Efforts Designed to Impact Disproportionality | Majority of participants were over 18 years of age |
| Ringwalt, C., Bliss, K.<br>**United States** | 2006<br>**Journal of Drug Education** | The Cultural Tailoring of a Substance Use Prevention Curriculum for American Indian Youth | Case study |
| Shore, J., Bloom, J., Manson, S., et al.<br>**United States** | 2008<br>**Behavioural Sciences and the Law** | Telepsychiatry with Rural American Indians: Issues in Civil Commitments | Descriptive study |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Simmons, D.<br>**New Zealand** | 2007<br>**The Journal of School Nursing** | Child Health Issues in New Zealand: An Overview | Lacked Aboriginal participant representation |
| Smith D, Varcoe C, Edwards N.<br>**Canada** | 2005<br>**Canadian Journal of Nursing Research** | Turning Around the Intergenerational Impact of Residential Schools on Aboriginal People: Implications for Health Policy and Practice | Case study |
| Spicer, P., Moore, K.<br>**United States** | 2008<br>**Chapter 7 in "Obesity in Childhood and Adolescence", Vol. 2** | Responding to the Epidemic of American Indian and Alaska Native Childhood obesity | Descriptive study |
| Starling, J., Foley, S.<br>**Australia** | 2006<br>**Journal of Telemedicine and Telecare** | From pilot to permanent service: ten years of paediatric telepsychiatry | Descriptive study |
| Stiffman, A. R., Brown, E., Freedenthal, S., et al.<br>**United States** | 2007<br>**Journal of Child and Family Studies** | American Indian Youth: Personal, Familial, and Environmental Strengths | Descriptive study |
| Stiffman, A. R., Freedenthal, S., Dore, P., et al.<br>**United States** | 2006<br>**Psychiatric Services** | The Role of Providers in Mental Health Services Offered to American-Indian Youths | Majority of participants over 18 years of age |
| Strickland, C. J., Walsh, E., Cooper, M.<br>**United States** | 2006<br>**Journal of Transcultural Nursing** | Healing Fractured Families: Parents' and Elders' Perspectives on the Impact of Colonization and Youth Suicide Prevention in a Northwest American Indian Tribe | Majority of participants over 18 years of age |
| Tarlier, D.<br>**Canada** | 2006<br>**University of British Columbia** | Nursing Practice, Continuity of Care, and Maternal-Infant Health Outcomes in a Remote First Nations Community | Dissertation |
| Tough, S., Clarke, M., Cook, J.<br>**Canada** | 2007<br>**Maternal and Child Health Journal** | Fetal Alcohol Spectrum Disorder Prevention Approaches among Canadian Physicians by Proportion of Native/Aboriginal Patients: Practices during the Preconception and Prenatal Periods | Lacked Aboriginal participant representation and respondents were over 18 years of age |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Turner, K., Sanders, M.<br>**Australia** | 2007<br>**Australasian Psychiatry** | Family intervention in Indigenous communities: emergent issues in conducting outcome research | Descriptive study |
| Unspecified<br>**United States** | 2005<br>**MinorityNurse.com** | Resources Available for Fighting SIDS in Native American Communities | News announcement |
| Unspecified | 2007<br>**Minority Nurse** | More Child Safety Education Needed in Black and Native American Communities | Position paper |
| Utter, J., Scragg, R., Schaaf, D., et al.<br>**New Zealand** | 2006<br>**Australian and New Zealand Journal of Public Health** | Nutrition and physical activity behaviours among Mäori, Pacific, and NZ European children: identifying opportunities for population-based interventions | Descriptive study |
| Van Wagner, V., RM., Epoo, B., et al.<br>**Canada** | 2007<br>**Journal of Midwifery and Women's Health** | Reclaiming Birth, Health, and Community: Midwifery in the Inuit Villages of Nunavik, Canada | Participants were over 18 years of age |
| Walls, M., Chapple, C., Johnson, K.<br>**United States** | 2007<br>**Deviant Behaviour** | Strain, emotion, and suicide among American Indian youth | Descriptive study |
| Weckert, R., Hancock, H.<br>**Australia** | 2008<br>**Women and Birth** | The importance of delayed cord clamping for Aboriginal babies: A life-enhancing advantage[88] | Literature review |
| Wessling, S.<br>**United States** | 2005<br>**Minority Nurse** | Closing the Infant Mortality Gap | News article |
| Winters, K., DeWolfe, J., Graham, D., et al.<br>**United States** | 2006<br>**Journal of Child & Adolescent Substance Abuse** | Screening American Indian Youth for Referral to Drug Abuse Prevention and Intervention Services | Lacks a programmatic/actionable component |
| Yates, P.<br>**Australia** | 2006<br>**Australian Family Physician** | Palliative Care for Specific Populations | Literature review |

| Authors<br>**Country** | Publication Year<br>**Publication Source** | Title | Reason for Exclusion |
|---|---|---|---|
| Yeates, K., Tonelli, M.<br>**Canada, United States, Australia, New Zealand** | 2006<br>**Current Opinion in Nephrology and Hypertension** | Indigenous health: update on the impact of diabetes and chronic kidney disease | Descriptive study |