



Preschool Vision  
Screening and Aboriginal  
Eye Health:  
An Environmental Scan  
and Literature Review

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## Introduction

In spring 2006, the National Collaborating Centre for Aboriginal Health (NCCAH) at the University of Northern British Columbia (UNBC) received funding from the Provincial Government to support the implementation of two, multi-year Aboriginal (First Nations, Métis, and Urban Aboriginal) health promotion initiatives: *ActNow BC* and *Pre-school Visual Screening (PVS)*. The two projects are hosted by the NCCAH at UNBC and are currently organized under the working title, BC Initiatives (BCI). The NCCAH is one of six national collaborating centres created by the Public Health Agency of Canada in 2005.

The Aboriginal-specific *Preschool Visual Screening (PVS)* initiative is a subset of a larger integrated cross-ministry strategy to provide universal hearing, dental, and vision screening to every child in the province under the age of six. Announced by BC Premier Gordon Campbell in March 2005, PVS seeks to optimize critical periods of early childhood development through universal vision screening for *amblyopia*, *strabismus* and *refractive errors*, increased coverage for prescription eyeglasses for children from low-income and income-assisted families, and public health checks at regional health authority child care centres for children aged 6, 12, and 18 months (BC Ministry of Health Services, 2005). To complement the larger initiative, BCI will administer \$1.3 million over three years to develop innovative, culturally safe, holistic approaches to vision screening for BC Aboriginal preschool children.

## Methodology

Two approaches were employed in this paper. First, an environmental scan of provincial, national and international programs and resources was compiled to determine ‘who is doing what’ in preschool vision screening and Aboriginal eye health. Information within the scan was largely collected through internet searches and, in some cases, was cross referenced for further clarification. Second, a review of select literature on Aboriginal eye health and vision screening programs was developed based on academic articles published in peer-reviewed and professional journal, government publications and those of non-governmental organizations. The review begins with a brief history of BC health care reform since the late 1990s and its connection to recent Aboriginal health initiatives. Next, it goes on to review the scientific debate underlying BC decision to implement universal vision screening. Finally, a review of the health status of Aboriginal peoples, particularly children, is offered along with a summary of Aboriginal eye health research, and health services. A variety of methods were employed in the literature review including database searches (PubMed, Ovid, Science Direct), footnote chasing, and hand browsing using relevant search terms. The report concludes with recommendations for the implementation of Aboriginal preschool vision screening pilot projects and knowledge translation activities across BC.

## Terminology

- ❖ **Aboriginal peoples** are the descendants of the original inhabitants of North America. There are three distinct groups of Aboriginal people recognized under Section 35 of Canada’s Constitution Act (1982): Indian, Inuit, and Métis. The term First Nations includes both Status

and non-Status Indians. Status Indians are registered by the Federal government and governed by the *Indian Act* of 1876, non-Status Indians are not registered or governed by the *Indian Act*. Inuit are a distinct population of Aboriginal peoples that reside primarily in the Canadian North and were registered under a revision to the Indian Act in 1924. Métis means a person of mixed First Nations and European ancestry who self-identifies as Métis and whose ancestors resided in the historic Métis Nation homeland. Métis people are not entitled to the provisions of the *Indian Act*.

- ❖ **Amblyopia**, commonly referred to as “lazy eye,” is a reduction in visual acuity caused by suppression of function usually in one eye. Amblyopia usually develops before 5 years of age and, if left untreated, can lead to poor visual acuity in one eye or blindness. Estimates of the prevalence of amblyopia in children aged 4-6 years vary between 2% to 5% (Bradley and Reiderer, 2000).
- ❖ **Strabismus**, commonly referred to as “turned eye,” is an abnormal alignment of the eyes that can result in loss of binocular vision required for fine depth perception. Strabismus can cause the brain to suppress the image from one eye, thus resulting in amblyopia. Like amblyopia, strabismus usually develops before 5 years of age and affects roughly 2% of the preschool population (Bradley and Reiderer, 2000).
- ❖ **Refractive errors** (nearsightedness, farsightedness and astigmatism) occur when light rays entering the eye meet in front of or behind the retina rather than directly on it causing blurred vision. They are the most common vision disorders, but are of lesser importance than amblyopia and strabismus in preschool vision screening. (Bradley and Reiderer, 2000).
- ❖ **Screening** is an examination of asymptomatic people in order to classify them as likely or unlikely to have a disease or those who are at risk for poor health outcomes. Ideally, screening is a quick, simple and low cost procedure that is universal in nature, meaning that it is applied to the entire population. Screening should be considered part of a continuum in that a positive screening test result will result in a referral to appropriate health providers and services (BC Ministry of Healthy Living and Sport, 2008).
- ❖ **Optometrists** are doctors of optometry who examine eyes to diagnose vision problems and ocular disease. They prescribe and fit eyeglasses and contact lenses and recommend treatments such as exercises to correct vision problems or ocular disorders (C Green Health Info, 2005).
- ❖ **Ophthalmologists** are fully qualified medical doctors with a post medical specialization in the diagnosis and treatment of disease and injuries of the eye (C Green Health Info, 2005).

## **BC Health Care Reform and Aboriginal Health**

With the publication of the Ministry of Health Planning’s report *A Picture of Health: How We are Modernizing British Columbia’s Health Care System* in 2002, BC unveiled an ambitious and wide-ranging strategy for health care renewal centred on four long-term goals: accessible, high quality health care; patient-centred public health care; improved health and wellness; and sustainable, affordable health care (BC Ministry of Health Planning, 2002). Building on the BC government’s “New Era” commitments set out in 1997 to improve the health of all British Columbians and reduce inequities in health status (BC Ministry of Health and Ministry Responsible for Seniors, 1997), the *Picture of Health* report recommended new approaches to acute care, primary care, health promotion, rural health and Aboriginal health. The focus on

Aboriginal health, in particular, was sparked by a BC report on the health of Aboriginal peoples released the same year.

In the 2001 Annual Report, *The Health and Well-being of Aboriginal Peoples in British Columbia*, BC's Provincial Health Officer – in conjunction with an Aboriginal Health Services Steering Committee and other Aboriginal health groups and organizations – documented trends in Aboriginal health status, community environments, physical environments, health services, and disease and injury prevention within the context of BC's five health authority regions. Although slight improvements were observed in infant and all-age mortality rates, the report exposed serious inequities in Aboriginal health status, with standards of living 20% below the provincial average and life expectancy rates roughly 7.5 years less than that of other British Columbians (Provincial Health Officer, 2001). The report targeted eight key areas where the greatest health gains could be achieved: early childhood development, tobacco cessation, alcohol and drug misuse, HIV/AIDS, diabetes, injury prevention, access to primary care, and Aboriginal health information and dissemination.

Following the announcement of BC's successful bid to host the 2010 Olympic and Paralympic Winter Games in Vancouver, a BC Legislative Assembly Select Standing Committee on Health was empowered to examine effective strategies to “change behaviour and encourage British Columbians to adopt lifelong health habits to improve their health and sustain the health care system” (BC Legislative Assembly Select Standing Committee on Health, 2004). In 2004, the Committee released their report, *The Path to Health and Wellness: Making British Columbians Healthier by 2010*, which examined five key risk factors including smoking, poor diet, physical inactivity, obesity, and the irresponsible use of alcohol. The committee outlined 29 recommendations for health policies, programs, strategies and infrastructure, one of which was a more proactive approach to vision, hearing, dental, speech and language screening for BC children (BC Legislative Assembly Select Standing Committee on Health, 2004). Although Aboriginal health issues were not addressed in the report, a health prevention strategy for Aboriginal British Columbians was listed as one of six key areas that warranted future discussion and exploration.

The discussion around Aboriginal health prevention strategies gained force in 2005, when the Province and the First Nations Leadership Council (comprised of representatives from the First Nations Summit, Union of BC Indian Chiefs, and Assembly of First Nations BC Region) entered into a New Relationship based on the principles of recognition, mutual respect, and reconciliation (*The New Relationship*, 2005). Central to the New Relationship is a commitment by the parties to work together to ‘close the gaps’ in the quality of life between Aboriginal people and the rest of the province. In May 2006, Métis Nation BC (MNBC) and the province also signed a Métis Nation Relationship Accord to close the gaps for Métis in British Columbia ([www.gov.bc.ca/arr/social/accord.html](http://www.gov.bc.ca/arr/social/accord.html)). With the ratification of the New Relationship Accords, First Nations and Métis in BC began to work on ‘health blueprints’ to improve Aboriginal health status and health services.

The BC First Nations Leadership Council's *First Nations Health Blueprint for BC* was designed to guide the ongoing development of the First Nations health sector, the blueprint outlined an action agenda focused on: delivery and access of health services, sharing in

improvements to national health care, health and wellness promotion, monitoring progress, clarifying roles and responsibilities between governments and organizations, and developing on-going collaborative working relationships (BC First Nations Leadership Council, 2005).

In November 2006, *The Transformative Change Accord: First Nations Health Plan* was released to build on and support the strategic framework developed in the blueprint document. Preceded by a Memorandum of Understanding (MOU) between the First Nations Leadership Council, the Province, and the Government of Canada, the parties agreed to collaborate in four key areas including: governance, relationships and accountability; health promotion/disease injury prevention; health services; and performance tracking (BC Ministry of Health, 2006). BCI's two Aboriginal specific health promotion projects, ActNow BC and Preschool Vision Screening, are announced in *The Transformative Change Accord: First Nations Health Plan* as a new strategy to close the health outcome gap for Aboriginal peoples across BC. While the Health Plan states that *all* First Nations children will regularly receive vision, hearing, and dental screening and treatment, the rationale behind this strategy and the means by which it will be achieved is not examined. To understand how vision screening might unfold in an Aboriginal context, we must first look to the scientific debate underlying vision screening and the nature and scope of the larger provincial initiative.

## **The Scientific Debate Underlying PVS: An Overview**

Over 80 percent of a child's learning is based on vision. Not knowing any different, many children accept poor vision and other eye ailments as normal and are often mistakenly labelled as learning disabled. Parents, for their part, do not always recognize the warning signs of vision impairment, some of which are very subtle including a lack of concentration, performing below potential, headaches, burning and itchy eyes, avoiding activities that require near-distance work, and holding objects too close (BC Association of Optometrists, no date). If vision disorders – notably refractive errors, amblyopia, and strabismus – are left untreated, children may experience serious long-term visual impairment and will not be able to realize their full learning potential (BC Association of Optometrists, no date). If detected early, many of these conditions can be corrected by an eye doctor (an optometrist or ophthalmologist) with corrective lenses or vision therapy.

In 2005, the Ministry of Health commissioned a systematic review from C Green Health Info on the science underlying preschool vision screening to inform the development of policy and practice for early childhood screening in BC. The report, titled *A Review of the Science Underlying Preschool Vision Screening with Implications for BC* (C. Green Health Info, 2005), explored best practices in vision screening from Canada, the United States, and Europe, including common visual impairments detected through screening, the optimal age range to target (from 0 to 6 years of age), the type of personnel to employ for screening (ophthalmologists, optometrists, public health nurses or lay screeners), specific types of tests to use (visual acuity charts, stereopsis, photoscreening, cover/uncover), and testing protocols. Additionally, the report addressed the long-standing debate on vision screening versus a full diagnostic examination. The BC Association of Optometrists (BCAO) contends that vision screening by family doctors and other public health practitioners is limited in its ability to

evaluate a child's overall eye health. The BCAA recommends a complete eye exam for children prior to school entry. Full eye exams, however, are considerably more expensive.

Although a direct cause and effect relationship between preschool vision screening and better long-term health outcomes was not established in the C Green Health Info report, indirect evidence suggested that "visual impairments are important, common, difficult to detect without testing, and treatable" (C Green Health Info, 2005). Four options were considered in BC's vision screening protocol based on this conclusion including:

- 1) Fortifying existing vision care (with or without adopting a systematic screening program).
- 2) Primary screening by public health nurses with secondary referral to an ophthalmologist or optometrist.
- 3) Screening by technical lay examiners.
- 4) Comprehensive exams by optometrists in lieu of screening.

The report noted that these options were not mutually exclusive; rather, a combination of approaches may likely be the best option.

A year later, the province commissioned another systematic review to determine the clinical and cost-effectiveness of preschool vision screening in comparison to a complete diagnostic vision examination by an optometrist or ophthalmologist. Conducted by the Health Technology Inquiry Service (HTIS), part of the Canadian Agency for Drugs and Technologies in Health, the September 2006 report titled *Preschool Vision Screening* assessed screening program effectiveness according to the following criteria:

- 1) Screening should do more good than harm.
- 2) The tests must be able to identify the defect.
- 3) There must be an appropriate intervention to treat the defect.
- 4) There must be an advantage in detecting and treating the defect at an earlier age
- 5) The cost must be justified.
- 6) The prevalence of the defect must be high enough to cause substantial disability to justify screening (HTIS, September 2006).

Although concluding that PVS programs meet most of the general criteria to consider when assessing a screening program, the report noted that there was no consensus as to who should be administering the vision screening. Moreover, no single test or group of tests had been shown to be superior for vision screening. Finally, in reference to cost-effectiveness, the report concluded that universal PVS has a relatively low-cost per quality-adjusted life year (QALY).

To date, the C Green Health Info and Health Technology Inquiry Service reports are the only systematic reviews prepared for the province in relation to vision screening. Importantly, neither review addresses the socio-cultural or economic determinants of health that may potentially impact vision screening implementation, including access to services for rural and remote populations or the cultural appropriateness of screening. In light of the evidence

provided in the systematic reviews, the province adopted a three pronged approach to preschool vision screening for BC (Springinotic, 2007):

- 1) ***Case finding for vision concerns*** using public health practitioners, physicians, and other early childhood practitioners in established programs and services with referral to vision specialists for diagnostic testing and follow-up with a goal to increase awareness of eye and vision health among parents, caregivers, and service providers.
- 2) ***Pilot public health vision screening for three year olds*** in each health authority to provide early identification and management of amblyopia and strabismus and reach a maximum number of children, in particular, those at highest risk for vision problems. To achieve this goal, the Ministry would work with the health authorities on the selection of pilot site locations to ensure that pilots include a mix of rural/remote and urban communities, English as a Second Language (ESL), and Aboriginal preschoolers. Until the screening of three year olds is entrenched, ***re-establish vision screening of children in kindergarten*** by public health professionals in each of BC's five health authorities. Additionally, the province expressed their intent to establish an advisory committee inclusive of the above noted professionals and other key stakeholders to provide strategic direction and support for the vision screening initiative.
- 3) The third component is **Program Evaluation** to determine what services will be evaluated and how and what data should be collected. The evaluation will be conducted in collaboration with the Human Early Learning Partnership (HELP) at the University of Northern British Columbia.

## **Provincial Vision Screening Steering Committee**

The provincial Vision Screening Steering Committee is comprised of BC ophthalmologists, optometrists, researchers from the University of British Columbia's Human Early Learning Partnership (HELP), representatives from each of the province's health authorities (Fraser HA, Interior HA, Vancouver Coastal HA, Northern HA, Vancouver Island HA), as well as representatives from BC Initiatives/NCCAH, the First Nations and Inuit Health Branch (FNIHB), the Ministry for Children and Family Development (MCFD), the Ministry of Education (MoE), the Ministry of Health (MoH), and Health Canada. The scope of the Vision Steering Committee is: to make recommendations on vision screening policies and practices; to advise selection of the vision screening tools and associated training methods for using the screening tools; to review and provide feedback on data collection, management, and program evaluation strategy; to discuss and provide recommendations on the scope of pilot projects and communication activities; and to facilitate information sharing and communication among all stakeholders (Springinotic, 2007).

The overall principles guiding the vision screening project are: 1) the earlier vision problems are detected the better the outcome; 2) the optimal time for screening and intervention is three years of age or younger; 3) vision screening can be conducted by non-vision specialists such as health unit aides and public health staff trained to use screening tools and appropriately screen; 4) vision screening can be conducted in collaboration with other stakeholders as determined by Health Authority staff who are trained to use screening tools and appropriately screen; 5) preschool children will have access to vision screening program services; 6) preschool

children with identified possible vision deficits will be referred to vision specialists for diagnostic assessment and follow-up; and 7) the Preschool Vision Screening program and Kindergarten Vision Screening will be evaluated based on evidence-based practice (Springinotic, 2007).

The PVS Steering Committee has a number of interrelated “in scope” activities including: 1) health authorities offering universal kindergarten screening until preschool vision screening of three years olds is established; 2) health authorities conducting vision screening pilots of children aged three with a minimum of one pilot per health area; 3) health authorities working collaboratively on the selection of pilot projects to ensure that these sites include a mix of urban vs. rural/remote communities, English as a first and second language, and Aboriginal preschool children; 4) case finding supported by the provision of vision and eye health information to parents, guardians and other care providers, health clinics, preschool and child care settings, child development centres, and other locations frequented by children and families; 5) a Vision Screening Training Manual, training approaches (train the trainer), and guidelines for referral and follow-up supported by the Ministry of Health; 6) health authorities screening staff will be responsible for data collection and management; and 7) linkages and partnerships with the UBC Human Early Learning Partnership, the NCCAH, and other related ministries (Springinotic, 2007). The Health Authorities “out of scope” activities include diagnostic procedures and screening of infants less than three years of age.

Several critical success factors are identified in the Program Charter such as: the executive sponsor (HA and MOH) and Steering Committee support for the completion of the project; effective information sharing and communication between MOH and key stakeholders; an information sharing protocol; effective linkages to other related projects in MOH, UBC HELP, MCFD, MOE, and the NCCAH; HA support, co-ordination and collaboration; sufficient staff to plan and implement the program; availability of vision screening manuals and regional staff training; and mitigation of identified risk factors (Springinotic, 2007). Identified constraints, issues, and risks include: changing priorities in MOH and HA that may affect successful implementation of vision screening activities, training requirements for HA staff, need for developing reporting tools to support health authority follow up and management of data quality, need to establish data sharing and data transfer agreements meeting FOIPA, and available budget to meet kindergarten and preschool pilot screening activities (Springinotic, 2007).

The Vision Screening Training Manual is intended to provide vision screeners with the information required to carry out the program in the preschool and kindergarten setting. After reviewing the manual screeners should be able to: understand the vision screening services to be offered by the health authorities, understand the purpose of the screening procedures for Stereopsis and visual acuity, accurately carry out the screening procedures for Stereopsis and visual acuity, record and interpret the results of the screening procedures, make appropriate referrals if indicated, and record findings of the referrals and complete necessary follow-up (Vision Steering Committee, 2007a). Kindergarten screening pilots began in September 2007 and have, in many cases, accompanied existing dental pilots and/or immunization clinics. Vision screening pilots for children 3 years of age began in the winter of 2008.

At the Public Health Nurse (PHN) Leaders Conference, held March 8, 2007, a number of opportunities and challenges were identified for the implementation of the early childhood vision screening program. In the area of universal kindergarten screening, PNH leaders saw the coordination of vision screening with dental and hearing screening services as a key opportunity but noted a number of limitations to this including: adequate time, access to vision services, coordination of program goals, and buy in from school staff and the public (Vision Steering Committee, 2007b). Several geographic and population considerations were also noted in the implementation of kindergarten screening such as language issues, small rural and remote schools, transportation to vision screening services, and financial barriers. Several resources were identified to mitigate these barriers, notably the development of effective training processes, training manuals, reporting strategies, and ensuring media support to raise awareness.

In the area of case finding, PHN leaders identified other opportunities such as exploring potential partnerships, accompanying other screening programs, and improving communication with primary care providers. Key challenges in case finding included servicing vulnerable populations (Aboriginal, refugees, and transient), adequate resources for family follow-up (i.e. glasses, transportation), and reaching both rural and urban populations. Of particular importance to BCI was the recognition by PHN leaders that Aboriginal perceptions of screening and health care services could be an issue and that train the trainer models should be considered for these populations (Vision Steering Committee, 2007b).

Although the Program Charter indicates that *all* preschool children will be screened and that Aboriginal preschool children will be included in pilot projects, it remains unclear as to how this will be realized and/or how rural and remote issues will be addressed.

## **BC's Aboriginal Population**

British Columbia is home to the second largest Aboriginal population in Canada.<sup>1</sup> According to the 2006 Aboriginal Census, there are 196,075 Aboriginal people in BC which is roughly 5% of the total population of the province. First Nations constitute the vast majority of BC's Aboriginal population (129,580 or 66%), followed by Métis (59,445 or 30%), Inuit (795 or 0.4%), multiple Aboriginal identity (1,655 or 0.8%), and other Aboriginal peoples not included in the other categories (4,605 or 2.3%). BC's Aboriginal population increased by 15% between 2001 and 2006, which is more than three times the rate of BC's non-Aboriginal population. The median age of Aboriginal people in BC is 28 years old, compared to 41 years of age in the non-Aboriginal population. (Statistics Canada, 2006)

There are approximately 200 urban, rural, remote/isolated Aboriginal communities in BC, each of which is representative of distinct language groups, geographies, and socio-political arrangements (treaty, non-treaty, self-government and non self-government). In 2006, 60% of the Aboriginal population in BC lived in urban areas, while 26% lived on reserves. According to the 2001 Aboriginal Peoples Survey, the Northern Health Authority has the highest percentage of

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<sup>1</sup> Ontario has the largest population of Aboriginal people (242,495), followed by BC (196,075), Alberta (188,365), Manitoba (175,395), Saskatchewan (141,890), Quebec (108,430), with the remaining 25,000 Aboriginal people residing in other provinces and territories.

Aboriginal peoples in BC (15.6%), followed by the Interior HA (5.7%), Vancouver Island HA (5.1%), Fraser HA (2.5%) and the Vancouver Coastal HA (2.4%). (BC Statistics, 2001).

## **Aboriginal Children’s Health Status**

The health status of Aboriginal peoples in British Columbia is widely recognized as “unacceptable and unsustainable” in comparison to BC’s non-Aboriginal population (BC Ministry of Health, 2006). Risks of developing diabetes, pneumonia, HIV/AIDS, or experiencing injury from a motor vehicle accident are greater for Aboriginal peoples than the rest of the population and reflect a wide range of historical disadvantages (colonialism, racism, residential school trauma, cultural alienation and assimilation) and social determinants (unemployment, poverty, inadequate housing, political marginalization) that are widespread and longstanding (Provincial Health Officer, 2001). Aboriginal children and youth are amongst the most vulnerable and disadvantaged group in the province and nationally with significantly higher rates of morbidity, mortality, sudden infant death syndrome (SIDS), FASD, poor nutrition, and lower birth rates than their non-Aboriginal counterparts.

For Aboriginal peoples, children are a gift from the creator to be treated with great care and respect. Children are the future of communities. By ensuring they get the best possible start in life, Aboriginal children will be able to develop into healthy parents, workers, and leaders in their communities in the future. The health and wellbeing of Aboriginal children requires striking a “balance between the physical, spiritual, emotional and cognitive sense of self and how these interrelate with family, community, the world, and the environment in the past, present and future” (Blackstock, Bruyere, Moreau, 2006: 8). Although federal, provincial and territorial governments, along with Aboriginal people themselves, deliver a range of programs for Aboriginal children and youth, significant gaps remain. In First Nations and Inuit Health Branch (FNIHB) 1999 report, *Emerging Priorities for the Health of First Nations and Inuit Children and Youth*, four priority areas are identified,<sup>2</sup> two of which are particularly relevant to PVS initiative – early childhood development (ECD) and providing early and continuous learning experiences (First Nations and Inuit Health Branch, 1999).

There is a strong body of evidence that suggests the first six years of a child’s life are crucial to future health and personal development. Identification and treatment for developmental delays (physical, social and emotional, speech, hearing, and vision) are more likely to have long-lasting and positive effects at this crucial stage of development. To enhance Aboriginal ECD, the FNIHB report made four recommendations: increased FASD prevention, the expansion of Aboriginal Head Start, enhancing child and family services networks (pregnancy, birth and child rearing, screening, risk assessment and referral), and SIDS awareness (First Nations and Inuit Health Branch, 1999).

Importantly, vision was not identified in the FNIHB report or other studies as a key health issue for Aboriginal children or youth. However, the early detection of learning disabilities, some of which may reflect a vision disorder, is noted as key to providing effective early and continuous learning experiences (First Nations and Inuit Health Branch, 1999). Oral

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<sup>2</sup> The four areas are early childhood development, providing early and continuous learning experiences, creating supportive, safe and violence-free communities, and fostering strong development in the pre-teen years.

health and hearing problems amongst Aboriginal children are given special consideration in FNIHB's report and numerous other studies (Harrison, MacNab, Duffy and Benton, 2006; Lawrence, Romanetz, Rutherford, Cappel, Binguis, and Rogers, 2004; Peressini, Leake, Mayhall, Maar and Trudeau, 2004). Noting that incidence of tooth decay for Aboriginal children is four times that of non-Aboriginal children and that hearing loss from ear infections is as high as 10%, FNIHB recommended the development of community-based awareness and prevention programs, screening, and improved standards of living in Aboriginal communities (First Nations and Inuit Health Branch, 1999). In 2004, the First Nations and Inuit Health Branch launched a Children's Oral Health Initiative to close the gap in dental health through education and awareness campaigns aimed at pregnant women and primary caregivers, preschool children from 0 to 4 years of age, and school-aged children from 5 to 7 years of age ([www.hc-sc.gc.ca](http://www.hc-sc.gc.ca)).

In September 2005, Health Canada released the *Aboriginal Children's Health Research Agenda Project* to synthesize existing research and identify gaps for future research. Phase I of the project involved a comprehensive, 10 year retrospective scan of Aboriginal children's health research literature from Canada, the United States, Australia and New Zealand. In Phase II of the project, key informants from national Aboriginal organizations, Aboriginal health organizations, research institutions, and various government departments were surveyed. The report highlighted some key findings in Aboriginal child health research in Canada. First, in the period from 1996 to 2005, only ninety research articles were published in Canada compared to 196 in the United States and 108 in Australia. Of those produced in Canada, the majority were created by health sector researchers (health care facilities) with only a small minority produced by the Aboriginal sector itself (national Aboriginal health organizations). Moreover, the vast majority of Aboriginal child health research has been concentrated in two provinces: Quebec (38% of articles) and Ontario (21% of articles), with only 8% coming from British Columbia (Health Canada, 2005a).

Aboriginal infants (0-2 years of age) accounted for the largest number of research articles, followed by school-age children (6-12 years old). Aboriginal preschoolers (3-5 years old) accounted for the least number of research papers in all countries. Although it is difficult to determine whether research was conducted on-reserve, off-reserve or in urban areas, twenty-seven of the twenty-nine articles specifying research location took place on-reserve with only two articles focused on urban centers. With respect to Aboriginal identity, the majority of research articles (62%) are focused on First Nations children (notably Cree, Mohawk and Ojibway-Cree), followed by Inuit children (37%). Only one research paper provided data on Métis children.

In Canada, the primary research topics in the 10 year period from 1996 to 2005 include environmental exposure (eleven articles), growth and development including obesity (ten articles), risk and protective factors including immunization (ten articles), nutrition (eight articles), blood and immune system diseases (eight articles), gastro-intestinal diseases (seven articles), diseases of the ear (five articles), endocrine/metabolic conditions (five articles), dental conditions (four articles), mortality (three articles), mental health (three articles), genetic disorders (three articles), infectious diseases (three articles), birth defects and prenatal exposure including FASD (two articles), urinary diseases (one article), musculoskeletal and connective tissue diseases (one article), nervous system diseases (one article), and skin conditions (one

article). There were no articles identified in the 10 year retrospective scan that dealt with diseases of the eye in Aboriginal children.

Findings from key informant surveys indicate a number of research gaps in Aboriginal child health research including: lack of research on Métis, non-status and urban Aboriginal children; lack of meaningful input from Aboriginal communities; lack of meaningful and sensitive research processes; gaps in our understanding of health status particularly research on preventing, tracking and monitoring FASD; research gaps in the area of health determinants within the historical context of the Aboriginal population and as community-wide, inter-generational, and family issues; and research gaps in health care data including cost-effectiveness, service delivery in rural, northern regions, and other barriers to service (Health Canada, 2005a). Perceived barriers to carrying out research to fill these gaps were extensive and included: lack of capacity, lack of cultural awareness amongst researchers, funding barriers, inadequate health information systems, research exhaustion in Aboriginal communities (i.e. disillusionment at having been “researched to death” and a general sense of mistrust). lack of awareness at a community level, methodological and logistical issues, and disparate research priorities (Health Canada, 2005a).

## **Aboriginal Eye Health Research**

In the 1991 Aboriginal Peoples Survey (APS), researchers found that approximately 24% (28,560) of respondents<sup>3</sup> reported having a vision disability and, of those identified, the vast majority lived on reserve (Statistics Canada, 1991). Despite these statistics, there continues to be a paucity of Aboriginal eye health and vision care research in Canada, particularly when compared to the United States and Australia. A search of PubMed (Medline) and various research and systematic review database sites found approximately twelve peer-reviewed articles on Aboriginal eye health issues, the majority of which dealt with refractive errors (Woodruff & Samek, 1976; Boniuk, 1973), strabismus (Wyatt & Boyd., 1973), and vision loss related to diabetes in adult and elderly populations. Of the older research, the 1973 review “A Decade of Northern Ophthalmology” by Dr. Elizabeth Cass from the *Arctic Ophthalmology Symposium* warrants particular attention.

Beginning with her first northern excursion in 1959, Dr. Cass documented common visual impairments (refractive errors, strabismus, and cataracts) amongst First Nations, Métis and Inuit from Aklavik to Pelly Bay. In addition to identifying social (diet, occupation, and trauma) and genetic (intermarriage) causes of vision loss, Dr. Cass articulated the difficulties of providing vision care in small, isolated Aboriginal communities, including language barriers, vast distances between communities, lack of services, poor infrastructure, and fear or distrust of ‘Whites’ (Cass, 1973). For the most part, the difficulties cited by Cass are still significant barriers to Aboriginal eye health and vision care today. Likewise, Cass’s suggestions for improvement in vision services – acquiring an understanding of Aboriginal history, culture, geography, diet, prevalent health issues, best practices for communication, and establishing respectful relationships – still resonate today.

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<sup>3</sup> The survey includes First Nations, Métis, and Inuit living in communities over 250 people. Communities with less than 250 and/or communities that chose not to participate in the survey are not included in this statistic.

Apart from the 1973 *Arctic Ophthalmology Symposium* studies, Aboriginal eye health issues did not re-emerge in the literature until the late 1990s, with a series of studies on diabetes related vision loss (diabetic retinopathy<sup>4</sup>), mobile retinopathy screening, and other vision care access issues amongst First Nations (Martin & Yidegiline, 1998; Maberley, Cruess, Barile, and Slakter, 2002; Kaur, Maberly, Change, and Hay, 2004). The literature also suggests that vision disorders are linked to socio-economic factors prevalent in Aboriginal communities, most notably, inadequate access to vision care and other services (CNIB, 2004). Overall, the research identified in this scan appears to be focused exclusively on adult and elderly First Nations and Inuit populations in northern Canada. With the exception of the 1973 Cass article, no Métis eye health and vision care research was found.

## **Aboriginal Health Services**

Aboriginal health services are typically received through a unique combination of federal, provincial, and First Nations-run programs and services. The province is responsible for providing all aspects of health services to British Columbians, including Status Indians living on or off-reserve. The federal government, for its part, has a fiscal responsibility to support the delivery of health services to Status Indians on reserve and to cover their Medical Services Plan premiums (BC Ministry of Health, 2006). With the assistance of FNIHB, many Aboriginal communities have developed community-based facilities capable of delivering health programs and services, although levels of control and accountability vary considerably. The multi-jurisdictional nature of Aboriginal health services, however, can create gaps, discontinuities and inadequacies in service (BC Ministry of Health, 2006). Moreover, well intentioned health promotion initiatives by provincial, federal or First Nations partners may lead to overlap or duplication in services. The process is also complicated by a lack of accurate health data for urban, Métis and Inuit populations.

In a recent survey of access and use of health services by Aboriginal peoples in BC, Wardman, Clement, and Quantz (2005) found that a substantial number of respondents accessed health services provided by an Aboriginal person. Although most respondents felt services were available, a number of barriers confronted service utilization, including a need to travel for services; a lack of access to more specialized services, particularly dental care and mental health; absence of culturally appropriate services; lack of awareness of available services; and self-reported barriers (racism, financial burden of travel to access services). Increased outreach, telehealth initiatives, and the provision of specialized services on a rotating basis in rural and remote communities were seen as important opportunities to reduce service inequities (Wardman *et al.*, 2005).

Vision care benefits are funded in accordance with the policies set out in the Non-Insured Health Benefits (NIHB) Vision Care Framework. To be eligible to receive vision care benefits under the NIHB Program, a person must be: a registered Indian; an Inuk recognized under one of the Inuit Land Claims organizations; a James Bay Cree and Northern Quebec Inuk who lives permanently outside the area covered in the James Bay Northern Quebec Agreement; currently

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<sup>4</sup> Diabetic retinopathy develops when high blood sugar damages the tiny blood vessels of the retina. These blood vessels weaken and develop small bulges, which may burst and leak into the retina clouding vision and causing scar tissue to form. BC Health Guide [www.bchealthguide.org](http://www.bchealthguide.org)

registered or eligible for registration under a provincial or territorial health insurance plan; and residing in Canada (Health Canada, 2005b). Under the program the following benefits are offered: eye examinations not insured by the province/territory plan; eyeglasses; eyeglass repair; eye prosthesis; and other vision care benefits specific to the recipients medical needs. Eligible recipients must receive vision care services from a certified health provider such as an optometrist or ophthalmologist. Under the NIHB, eligible preschool children that tested positive in the vision screening program would receive vision care benefits including follow up with an optometrist or ophthalmologist, prescription glasses, or other required treatments for vision disorder identified through screening.

## **1. Vision Screening/Eye Health Organizations in BC and Canada**

### ***British Columbia***

There are currently no province-wide preschool vision screening programs in British Columbia; however, periodic vision screening for preschool and school aged children by public health nurses occurred throughout BC in the mid 1990s and early 2000s. Discontinuation of screening programs was largely attributed to: 1) lack of evidence of benefit, 2) insufficient resources to provide mass screening given other public health priorities, and 3) budget cuts (C Green Health Info, November 2005). Despite termination of these programs, screening is still believed to be carried out on an *ad hoc* basis by various health professionals and Early Childhood Educators (ECE) across the province and in a wide variety of settings. Aboriginal children's participation in past vision screening initiatives is difficult to determine, as is specific data on Aboriginal children's eye health or visual impairments. A list of key BC vision screening initiatives and entities is listed below.

#### ❖ Focus on Eyes

In this two year pilot project (1983-1985) by the BC Ministry of Health's Preventative Services and the Northern Interior Health Unit (now Northern Health), routine screening programs for children in Kindergarten, Grades 1, 3, 5, and 7 were evaluated to determine if there was a scientific basis for reducing vision screening services by one grade. There was no indication of ethnic identity in the pilot data although, as noted earlier, the Northern Health Authority has a significantly larger Aboriginal population than the other health authorities. After screening 5,718 children in the Prince George school system, it was noted that absolute numbers of children with eye problems rose steadily as grades increased, as did the prevalence of eye problems. The pilot project concluded that routine vision screening programs should be continued for children in Kindergarten, Grade 1 if not previously screened in Kindergarten, Grades 3, 5, and 7. Further research on the cost-effectiveness of vision screening programs was also recommended.

#### ❖ Vision First Check

A joint initiative of the BC Association of Optometrists and the BC Ministry for Children and Families, the Vision First Check pilot project provided one-time vision screening for children aged 2 and 3 in four communities across BC (Cranbrook, Prince George, Powell River, and Sooke) from January to June of 1998. Performed by local optometrists at no cost to the family or

the Medical Services Plan of BC, the pilot's purpose was to determine whether the program would result in a significantly higher number of two and three year olds receiving a thorough vision assessment than had been currently indicated by provincial government data. Marketing materials were also developed in conjunction with the Ministry of Children and Families and distributed to families, health units, family physicians, and day-care operators. Aboriginal communities were cited as being involved in the pilot (Bradley & Reiderer, 2000, p. 254); however, information regarding their level of participation or specific challenges in Aboriginal eye health or preschool screening is lacking. Although, the pilot was well received and succeeded in increasing the percentage of preschool children receiving professional eye care, it was discontinued due to a lack of funding and a reliance on BCAO volunteerism.

#### ❖ The British Columbia Association of Optometrists (BCAO) & *a-b-See* Program

The BCAO links over 400 practicing optometrists in 102 different communities across the province. Mandated to “uphold both the professional and public standing of optometry within the province” the BCAO works to create awareness about eye care and the general health of all British Columbians ([www.optometrists.bc.ca](http://www.optometrists.bc.ca)). The BCAO has actively participated in two important preschool eye health programs in BC: the aforementioned Vision First Check Program and the *a-b-See* program.

In April 2003, the BCAO launched the *a-b-See* program, a province-wide preschool eye health initiative to identify vision disorders and raise awareness among parents, teachers, and the children themselves. As part of *a-b-See*, the BCAO distributes free activity kits on common eye diseases, disorders, warning signs, and first-aid instruction to interested preschools, child-care centres, and kindergarten classes. The kits also include fun activity sheets and materials for kids aimed at creating a positive and fun image of glasses (Magic Glasses), promoting awareness of a child's own eyes and visual performance (Eye-deas), promoting eye-body coordination skills (Footprints to Follow), creating awareness of a child's own eyes and those of their classmates (Googley Eyes), promoting visual memory and shape recognition (Matchmaker), and promoting awareness of vision and the importance of glasses (Coloring Safari).

Since its inception, *a-b-See* has sought to be inclusive of BC's various ethnic communities in their eye and vision awareness campaigns. To date, they have successfully translated the *a-b-See* package into five different languages including Cantonese, French, and Punjabi. The BCAO has also expressed an interest in modifying *a-b-See* packages to better suit Aboriginal audiences; however, the BCAO is hampered by a lack of data on the actual number of Aboriginal preschool children in the province or their current level of access to the *a-b-See* program and optometric services generally (Cross reference of BCAO a-b-See program for clarification, October 2006).

#### ❖ Aboriginal Early Childhood Development Programs

Aboriginal early childhood screening and assessment is carried out on an ad hoc basis in a variety of Aboriginal ECD programs. The following is a select list of BC ECD initiatives:

- Aboriginal Infant Development Programs (AIDP)

Aboriginal Infant Development Programs (AIDP) in British Columbia offer support to families of infants who are at risk for or have been diagnosed with developmental delays. The BC Association of Aboriginal Friendship Centres is the Host Agency for the Office of the Provincial advisor for AIDP, and the programs are funded by the Ministry for Children and Family Development. AIDP is guided by three principles: interventions for children with developmental problems are most effective if begun early in a child's life; infancy is an important period of life and delays in development during that period may have long-lasting cumulative effects on the patterns of development of a child, as well as on the patterns of interaction between the child and his/her family and community and; the family unit is the most crucial source of learning, of emotional support, and of developmental encouragement available to the child ([www.aidp.bc.ca](http://www.aidp.bc.ca)). AIDP is voluntary, family-centred, and focused primarily on children aged 0-3, although some programs include children up to 6 years of age. AIDP consultants support families by offering home visits, play groups, parent education opportunities, parent support groups, and parent to parent connections. Screening and assessment for developmental delays including vision deficits are also offered in a culturally sensitive and meaningful way ([www.aidp.bc.ca](http://www.aidp.bc.ca)).

- Success by 6

Success by 6 is a joint initiative between communities, Credit Unions of BC, United Ways of BC, and the Ministry of Children and Family Development that is dedicated to ensuring those children ages 0-6 have access to programs that support their healthy growth and development. The initiative engages citizens in ECD and funding programs that strengthen services for young children and families. Success by 6's vision is to build the capacity of parents and communities to support children aged 0-6 to become healthy, safe and secure, successful learners, and socially engaged and responsible ([www.successby6bc.ca](http://www.successby6bc.ca)). Success by 6 began implementation of an Aboriginal Engagement Strategy in 2004 in recognition of the importance of culture, language, self-determination, and self-government to BC's Aboriginal population. The Aboriginal Engagement Strategy is designed to increase Aboriginal representation in Success by 6 initiatives, strengthen community capacity and build cultural awareness. Although Success by 6 is not a program like AHS or Mother Goose that provides a specific service where screening and assessment might occur, its work in ECD knowledge translation and knowledge access invariably increases awareness of optimal childhood development in areas such as vision, dental, and hearing.

- Aboriginal Head Start (AHS)

### Off-Reserve

AHS in Urban and Northern Communities is an early intervention preschool program established in 1995 for off-reserve Aboriginal children. Its primary goals are to support Aboriginal ECD, instil cultural pride, and ensure school readiness for children aged three to five before they enter the mainstream school system ([www.ahsabc.com](http://www.ahsabc.com)). AHS programming has six component areas: Aboriginal culture and language, education, health promotion, nutrition, social support, and parental involvement. AHS is fully funded by the Government of Canada and there is no cost transportation, snacks or meals for participants. The Aboriginal Head Start Association of BC is

a non-profit society representing the twelve off-reserve sites in BC (Awahsuk AHS in Surrey, Cedar Road AHS in Prince Rupert, Comox Valley AHS in Courtney, Eagle's Nest AHS in Vancouver, Future 4 Nations AHS in Mission, Qwallayuw AHS in Campbell River, Kermodé AHS in Terrace, Little Moccasins AHS in Williams Lake, Prince George AHS, Power of Friendship AHS also in Prince George, and Singing Frog AHS in Vancouver).

### On-Reserve

In 1998, AHS was expanded to serve First Nations communities on-reserve. AHS On-Reserve is designed to prepare young First Nations children for their school years by meeting their emotional, social, health, nutritional, and psychological needs. The AHS framework was adjusted to reflect the First Nations operating environment, including existing child development initiatives and community activities (*AHS On-Reserve Annual Report, 2000-2001*). The AHS on-reserve also retains the six key component areas in their programming. In 2000-2001, there were approximately seventy-five AHS on-reserve in BC, although this number has dropped in recent years as a result of community capacity to carry out the program.

### AHS National Training

Although AHS On-Reserve and AHS in Urban and Northern Communities are managed separately, they work collaboratively on a number of activities such as evaluation, resource development, program planning, and national and regional training events. The National AHS Training Workshop is a three day event and is held in a different city each year. Training needs are identified by AHS staff, Health Canada consultants, and by local/regional/national evaluation data. Each year, the workshop is dedicated to a different theme that reflects high-priority training needs related to the six program areas.

### Screening and Assessment Tools used in Aboriginal ECD Programs

There are numerous screening and assessment tools and approaches (formal and non-formal, standardized and community-specific) used in Aboriginal ECD programs. In a recent review of First Nations early childhood programs in BC, Jessica Ball (Ball and Moselle Consulting) examined the screening/assessment/referral practices and experiences of ECD workers in an effort to capture their knowledge and guide decision-making around training and service delivery. Ball discovered that in most programs, more than one tool was being used to identify developmental delays, with the Ages and Stages Questionnaire (ASQ) being the most popular (Ball, 2006). A number of tools and methods have also been creatively adapted to fit community requirements, values and beliefs. For example, tools and methods were customized to consider the role of parents, community health nurses and other specialists, as well as recording of data and communication strategies (Ball, 2006).

In 2006, FNIHB released a report on screening tools for the Maternal and Child Health Program. Of the ten screening tools targeting infants and young children, there are two that include vision screening as a developmental area for identification and assessment: the Nipissing District Developmental Screen and the Child Development Inventories (FNIHB, 2006). The Nipissing District developmental Screen (NDDS) tests vision, hearing, speech-language, gross

motor, fine motor cognitive, and self-help skills for preschool children aged 0 to 6 through a ‘yes’ and ‘no’ questionnaire for parents or caregivers, as well as age appropriate activity sheets (FNIHB, 2006). The staff skills requirement for implementing the NDDS is minimal, and training videos are available. It is used extensively in First Nations communities in Ontario, BC and the Northwest Territories. The Child Development Inventories (CDIs) are focused on infants up to 18 months and targets vision delays among others. Like the NDDS, CDIs involve a parent questionnaire; however, the test must be given by a paraprofessional. The vision screening component of NDDS and CDI can be considered as quite rudimentary since optometrists and ophthalmologists are not consulted, specific vision disorders are not identified, follow-up can be lacking, and it appears to be conducted on an ad-hoc basis

### ***Alberta***

Preschool eye health and vision care education and awareness in Alberta is carried out by optometrists through the *Eye see...Eye learn (ESEL)* program, a pilot project dedicated to the prevention, early detection and management of eye and vision problems that impact the health, development, education and welfare of preschool children. Launched in October 2004 by the Alberta Association of Optometrists (AAO) and Ministry of Children’s Services, *ESEL* is one of three pillars that make up the Class of 2020 program, an Alberta Centennial Project initiative funded by the Ministry of Children’s Services and implemented through Alberta’s school districts. The second pillar of the Class of 2020 is a book series called *Bright Eyes* that is aimed at demystifying comprehensive eye exams, eye diseases and conditions for students from kindergarten to grade 3 through illustrations and easy to understand terminology. The third pillar, *Get Focused on Light*, is a new “crate” for the Alberta Grade 8 Science Curriculum. Similar to the *a-b-See* program, *ESEL* has been translated in several different languages.

Aboriginal preschool children’s participation in *ESEL* is unknown; however, when contacted for cross-reference and further clarification AOA indicated that many northern Alberta school districts have a significant Aboriginal population while others are almost entirely Aboriginal. The biggest challenge identified by *ESEL* deliverers was that of compliance on the part of parents. To address this issue, the AOA has offered more comprehensive optometric services in the schools and has sent optometrists to specific reserves to provide services.

### ***Ontario***

In Ontario, preschool vision screening is provided by primary care workers as part of the 18 month “well baby” visit with subsequent testing at age 2-3 years and 4-5 years. The validity of Ontario’s screening program has been evaluated in at least one instance with results published in the *American Journal of Public Health* in 1999. In “Measurement of the Validity of a Preschool Vision Screening Program” Robinson, Bobier, Martin and Bryant, (1999) examine how well strabismus and significant refractive errors could be detected by public health nurses trained to administer tests of visual acuity, stereoacuity, and ocular alignment. Although there is a lack of strong epidemiological evidence for or against school vision screening programs, their study demonstrated that more than 10% of the preschool-aged population had significant vision problems that had gone undetected despite government-subsidized vision care (Robinson *et al.*, 1999). The study concluded that public health nurses can effectively administer screening tests and, as such, the authors recommended continuation of screening practices in Ontario. As with

BC and Alberta, Aboriginal children's participation in Ontario's vision screening program has not been documented, nor has any Aboriginal specific eye and vision health data.

The Ontario Association of Optometrists (OAO), a voluntary professional organization representing over 1000 optometrists in Ontario, is not involved in preschool vision screening. The OAO website, however, has some online resources for children, parents, and teachers on eye and vision health. Inquiries sent to the OAO were not returned.

### ***Saskatchewan***

Saskatchewan currently has no province-wide preschool vision screening program. Inquiries to the Saskatchewan Association of Optometrists (SAO) website to clarify information indicated that in geographic areas where there was a significant Aboriginal population, optometric services were being underutilized. This underutilization may reflect a lack of access, or a lack of education and motivation to use optometric services.

### ***Manitoba, Quebec, and the Yukon***

No information regarding preschool vision screening protocols was readily available for Manitoba, Quebec or the Yukon. In the case of the Yukon, no such association exists.

### ***New Brunswick***

In New Brunswick, public health nurses conduct vision and hearing screening for children at age 3.5 years of age. Aboriginal preschool children's participation in NB screening protocols is unknown, as are any eye or vision health problems particular to the population.

### ***Nova Scotia***

Public health nurses conduct vision screening for children 4.5 to 5.5 years of age in Nova Scotia. Aboriginal preschool children's participation in NS screening protocols is also unknown, as is any eye or vision health problems particular to the population. Optometrists in Nova Scotia are not involved in the vision screening program, however, the Nova Scotia Association of Optometrists (NSAO) has interactive vision testing and eye health resource links on their website similar to those of the Ontario's Association of Optometrists

### ***Prince Edward Island***

In Prince Edward Island (PEI), vision screening is carried out by public health nurses for children at birth, 2, 4, 6, 12, 15 and 18 months, and at 4 to 4.5 years of age. Aboriginal preschool children's participation in PEI screening protocols is unknown, as are any eye or vision health problems particular to the population. Doctors of Optometry in PEI are not involved in this vision screening program.

### ***Newfoundland and Labrador***

Public health nurses conduct vision screening for children at three years of age in Newfoundland and Labrador. Aboriginal preschool children's participation in NFLD and Labrador screening protocols is unknown, as is any eye or vision health problems particular to the population. Optometrists are not involved in the screening program.

### ***Northwest Territories***

In the Northwest Territories, vision screening is conducted by public health nurses. However, the age of children involved in testing could not be obtained. There is no known optometry association in the territory. Aboriginal preschool children's participation in NWT screening protocols is unknown, as is any eye or vision health problems particular to the population.

### **Canadian Association of Optometrists**

The Canadian Association of Optometrists (CAO) is a professional association representing over 3,200 optometrists across Canada and linking ten provincial optometry associations. Established in 1941, the CAO's mandate is to advance optometric education and research, promote inter/intra professional relations, and engage in political action and advocacy with government in all matters concerning optometry.

The Children's Vision Initiative (CVI) was launched by the CAO in 2003 to help ensure that all children in Canada have access to appropriate, quality eye health and vision care throughout their developmental years. The CVI is currently developing a framework for children's eye health and vision programs.

### **Canadian Ophthalmological Society**

Established in 1937, the Canadian Ophthalmological Society (COS) aims to assure the provision of optimal eye care to all Canadians by promoting excellence in ophthalmology and providing services and support to its members in practice. The COS has some eye health and vision care resources on its website (brochures and fact sheets on vision disorders and eye safety), but does not have public programs and services.

### **Canadian National Institute for the Blind**

The Canadian National Institute for the Blind (CNIB) is a nationwide, community-based charitable foundation engaged in eye health and vision care research, public education, and programs and services, including peer support networks, rehabilitation counselling and training, and a resource library.

#### **❖ CNIB's *Circles of Light Project***

In 2002, CNIB began a two year project with First Nations communities in Ontario, Alberta and British Columbia to identify and address the needs of individuals dealing with vision loss. The final report, entitled *Circles of Light Project: Vision Care and Rehabilitation Problems and Solutions Emerging through a Culturally Appropriate Participatory Action*, examined access to

vision services, barriers to services (cultural appropriateness, geography, community capacity etc), and methods to strengthen community resources, engagement and education strategies. The report offered up several recommendations for service provision, health policy and public awareness and education, including establishing CNIB-community partnerships to facilitate training, overcoming transportation barriers and other impediments to accessing services, adopting the World Health Organization's Vision 2020 policies, and improving access to education materials.

#### ❖ *CNIB's Culturally Relevant Visual Acuity Charts for Aboriginal Canadians*

In the spring of 2005, CNIB funded another initiative aimed at improving the eye and vision health of Aboriginal Canadians. Led by Dr. Graham Strong at the University of Waterloo, the project involved the development of culturally relevant eye chart symbols for visual acuity tests involving First Nations, Métis and Inuit Canadians. Visual acuity charts are composed of a variety of component characters, such as letters, that can be easily identified by all persons being tested. Research has demonstrated that vision testing is far more accurate when eye charts contain culturally appropriate symbols rather than unfamiliar words or letters (Strong, Guns, Rivard, no date). Using culturally relevant symbols helps to overcome issues of literacy for all age groups and can ameliorate the impact of cultural alienation and intimidation, thereby improving overall testing results and subsequent eye care rehabilitation.

For Aboriginal Canadians who *likely* have a higher incidence of vision problems than the non-Aboriginal population, a culturally appropriate visual acuity chart is paramount (Strong, et al, no date). The development of the chart involved several steps. First, an email survey was sent to 743 key informants across Canada, including individuals, community services leaders, and Aboriginal organizations, to devise a list of potentially relevant symbols. Reflective of Aboriginal Canadians' intimate and historical connection to the natural world, the symbols were composed of characters related to the flora and fauna of northern and southern Canada. A series of focus groups and workshops were then used to assess the relevancy of the symbols for First Nations, Métis and Inuit populations. Through this process, an Inuit specific chart with symbols such as a whale, polar bear, igloo, and snowmobile and a First Nations/Métis specific chart with symbols that include a beaver, campfire, moose, elk, and turtle, were developed. Subsequent validation testing using non-Aboriginal university subjects indicated that the chart was effective and warranted further verification from members of the target population.

#### ❖ *CNIB's Teleophthalmology Project*

The third and final project worth noting with respect to Aboriginal populations is CNIB's teleophthalmology pilot. Led by Dr. David Maberley from the University of British Columbia, the project connects eye care professionals in urban centres with diabetic patients living in rural and remote communities. Using a Secure Diagnostic Imaging (SDI) tool, digital images of a patients' eye are transmitted to an urban health centre where retinal specialists review the images and make diagnoses. For Aboriginal Canadians who are three to five times more likely than the non-Aboriginal population to develop diabetes and who regularly experience difficulties accessing health services and specialists, the teleophthalmology is especially beneficial (Maberly

et al, 2002). The move to telehealth for vision problems is strongly supported by other research projects that have found serious inequities in vision services.

In “*The Current Status on Diabetes Care, Diabetic Retinopathy Screening, and Eye-Care in British Columbia’s First Nations Communities*,” Kaur *et al.* (2004), evaluated the current status of diabetes care, basic eye care, and diabetic retinopathy screening amongst BC First Nations with diabetes living on-reserve, Kaur *et al.* conducted a mail-out survey directed at Community Health Representatives (CHR) and the Chiefs of the respective bands. Inquiries into community size, community accessibility (road, air, and water), the prevalence of diabetes, barriers to diabetes care (providers and accessibility), barriers to primary and secondary eye care, and diabetic retinopathy care (providers and accessibility) were used to determine quality of care and recommendations for improvement. Overall, the study found that on-reserve First Nations in BC do not have access to annual eye examinations by eye-care professionals (optometrists or ophthalmologists); rather, eye evaluations and retinal screening were often the responsibility of individuals with little formal training in this area.

## **2. Overview of International Vision Screening/Eye Health Organizations (U.S. & Australia)**

Although there is no shortage of international research or initiatives dedicated to preschool vision screening, this overview is limited to two countries in particular: the United States and Australia. Both countries have significant Aboriginal populations and related eye health and vision care research projects. Additionally, the WHO’s *Vision 2020: Right to Sight* program is reviewed.

### **United States**

#### **❖ PVS Scientific Debate in the US**

In 2004, the US Preventative Task Force issued recommendations on screening for visual impairment in children younger than age five (USPSTF, 2004). Intended as an update to the 1996 *Guide to Clinical Preventative Services: Periodic Updates*, the task force recommendations stem from a 2004 systematic review which found that: visual impairments are common in children under five years of age (between 5-10%), indirect evidence indicates early intervention is beneficial, and treatment of certain refractive errors in children younger than age three years may interfere with the development of the eye (Research Triangle Institute, 2004). As in Canada, preschool vision screening in the U.S. is a patchwork of practice patterns that is sporadic and ad hoc. Some U.S. states have used legislative power to mandate vision screening and/or full optometric examinations.

#### **❖ National Eye Institute (NEI)**

The National Eye Institute (NEI) was established in 1968 as part of the National Institutes of Health (NIH), US Department of Health and Human Services. NEI’s mission is to develop new approaches to the prevention, diagnosis, and treatment of diseases affecting eye health and visual acuity. NEI’s activities are focused on research, disease prevention, and health promotion. In

1991, the NEI established the National Eye Health Education Program (NEHEP) in partnership with public and private organizations engaged in eye health and vision care education and awareness campaigns – some of which target Aboriginal Americans (National Eye Institute, 2004). Additionally, the NEI has funded a variety of research pilots, including the Tohono O’Odham Vision Preschool Screening project, an American Indian screening program (see below).

❖ Prevent Blindness America

Founded in 1908, Prevent Blindness America (PBA) is a volunteer eye health and safety organization dedicated to fighting blindness by providing a continuum of vision care. PBA conducts vision screening for amblyopia in preschool and school-aged children through a train the trainer certified screening program ([www.preventblindness.org](http://www.preventblindness.org)).

❖ Project Universal Preschool Vision Screening (PUPVS)

Project Universal Preschool Vision Screening (PUPVS) is a cooperative venture between the U.S. federal Maternal and Child Health Bureau and the American Academy of Pediatrics. The primary goal of PUPVS is to pilot test the PVS Task Force 1998 guidelines for children between three and four years of age (Hartmann, Bradford, Chaplin, Johnson, Kemper, Kim, March-Tootle and Writing Committee, 2006.) and ensure appropriate follow-up. Additionally, PUPVS hopes to encourage collaborative relationships between key stakeholder groups including: the American Academy of Optometry, the American Academy of Ophthalmology, National Children’s Eye Care Foundation, Head Start, Prevent Blindness America, Association of Maternal and Child Health Programs, and the National Eye Institute to name a few.

Five pilots were chosen through a competitive RFP process, with each site being awarded approximately \$20,000 to develop and implement community-based, collaborative PVS. Diverse groups were encouraged to apply from state government departments and medical universities, to NGOs and community organizations. RFP applicants were required to describe how screening would be done, how underserved children would be targeted, how existing and new partnerships would be sustained, who would be conducting screening, how they would be trained, and follow-up procedures (Hartmann *et al.*, 2007). Although the volunteers from the community based programs and primary care staff “enthusiastically embraced” the new screening program and training, sustainability proved to be a major stumbling block (Hartmann *et al.*, 2006). Hartmann *et al.* noted significant deviation from the recommended screening protocol, as well as variation between pilots conducted by primary care specialist and community organizations.

❖ Healthy Vision 2010

Healthy Vision 2010 is one component of the larger Healthy People 2010, a national health promotion and disease prevention initiative that includes health goals and objectives for Americans over the next decade, with an emphasis on early diagnosis and treatment (Bowyer & Kleinstein, 2000). Intended to complement the World Health Organization’s *Health for All* strategy, the mandate of Healthy Vision 2010 is for early detection, treatment and rehabilitation to reduce or eliminate chronic illness. As well, it addresses broader issues such as access and

quality of health care services and improving the availability of health promotion information. Healthy People 2010's focus areas are similar to BC's ActNow and Early Childhood Screening programs, including an emphasis on vision, hearing and dental screening; tobacco use; physical activity, nutrition and obesity; maternal, infant and child health; and health communication (Bowyer & Kleinstejn, 2000).

In addition to meeting the overall goals of Healthy People 2010, the Healthy Vision stream has 10 key objectives aimed at improving the visual health of the nation and reducing visual impairment. Specific strategies include increasing regular eye examinations for children and adults; increasing vision screening for preschool children; reducing occupational eye injuries; increasing the use of protective eye wear; reducing visual impairment due to refractive errors, glaucoma, cataracts and diabetic retinopathy; and increasing the use of vision rehabilitation (Bowyer & Kleinstejn, 2000).

#### ❖ Vision In Preschoolers

The Vision in Preschoolers (VIP) study is a multi-phased, multi-centred research project designed to identify the best test(s) for screening preschool children within the Head Start setting. In the United States, Head Starts are federally funded and mandated to provide vision screening for preschoolers three to five years of age (Schmidt, 1999). Screening for amblyopia, strabismus, significant refractive errors, and associated risk factors is conducted on board mobile medical units or *Vision Vans* staffed by trained lay screeners and licensed eye care professionals. These units are in five different geographic locations: Columbus, Ohio; Boston, Massachusetts; Berkley, California; Philadelphia, Pennsylvania; and Tahlequah, Oklahoma (NHSA Dialog, 2005). Eleven screening tests were used in Phase I of the project including: Lea Symbols, HOTV symbols, Random Dot E, Stereo Smile, Cover-Uncover, Non-cycloplegic Retinoscopy, Retinomax 2 Autorefractor, iScreen, MTI Photoscreener, PowerRefractor, and SureSight (NEI, 2006). By 2005, the VIP study had screened approximately 4,883 preschoolers in the five clinical centres and provided comprehensive eye examinations to 4,685 preschoolers (NHSA Dialog, 2005). *Vision Vans* have been vital to VIP's success and have enabled researchers to develop a controlled, standard setting for vision screening that allows comparability across centres with the potential of expansion to the general public.

#### ❖ American Indian/Alaska Native Eye Health

In the United States, there is a great deal more research on Indigenous eye health and vision care issues than in Canada, particularly with respect to vision disorders among children (Wick & Crane, 1976; Kershner, 1984; Lyle, Grosvenor, Dean, 1972; Garber, 1981; Maples, Hermann, Hughes, 1997; Harvey, Dobson, Miller, 2006). A review of the literature over the last thirty years suggests that the two most common vision disorders among American Indian/Alaska Native children and adult populations are corneal astigmatism (Mohindra & Nagaraj, 1977; Garber & Hughes, 1983; Pensyl, R.A. Harrison, P. Simpson, J.W. Waterbor, 1997) and refractive errors (Heard, Reber, Levi, Allen, 1976). Both astigmatism and refractive errors have also been found to be greater among children suffering from FAS (Stromland, 2004). Other visual impairments affecting American Indian and Alaska Natives include trauma, glaucoma, cataract, diabetic retinopathy, age-related macular degeneration, and trachoma (Rearwin *et al.*, 1997; Lee *et al.*,

2005; Mansberger *et al.*, 2005). In a 1976 article by two South Dakota optometrists, it was argued that “American Indians have significantly more visual problems than Caucasians” and if they are “expected to take their place in American society they should at least have an equal visual chance so they can learn at their highest capacity” (Wick and Crane, 1976: 39-40). As optometrist Deborah Adler-Grinberg argues, sporadic and inadequate eye and vision care services for on-reserve American Indians are largely to blame. Indeed, underserved on-reserve populations are forced to travel long distances to access services, which is both a financial and emotional burden (Adler-Grinberg, 1986).

#### ❖ Indian Health Service (IHS)

The Indian Health Service was established in 1954 with the IHS Transfer Act which shifted Indian Health care responsibilities from the US Department of the Interior to the US Public Health Service. The extent of health care and range of services are contingent on government funding. A distinct pattern is visible in health care service usage among American Indians and Alaska Natives in that IHS is used for primary care services, while private programs for specialty care fall under contract and compact health care – government-funded, tribal run health care services (Dixon, 2001). Eye health and vision care screening and health promotion programs, such as the *National Eye Health Education Program’s American Indian and Alaska Native Diabetic Eye Disease Communication Plan*, are typically a mix of both IHS and compact/contract health care. As in Canada, access to culturally appropriate vision care is an obstacle, as are socio-economic status and transportation issues (NEI, 2004).

#### ❖ Tohono O’Odham Preschool Vision Screening Program

Formerly known as the Papago Indians or People of the Desert, the Tohono O’Odham’s 25,000 members live in four separate communities in the Sonoran Desert – a 2.8 million acre land base that stretches from south central Arizona to northwest Mexico. Tohono O’Odham children, like many other American Indian/Alaska Native tribes, suffer from high rates of astigmatism,<sup>5</sup> with roughly one in three Tohono O’Odham children (33%) requiring eyeglasses by school entry (Miller, Dobson, Harvey, Sherrill, 2000). Theories abound as to why astigmatism is so prevalent in Tohono O’Odham children, from possible genetic links to Mongolian peoples to the practice of squinting as a defence against the bright desert light (Arizona Daily Star, 1999).

To address problems of astigmatism, a largely undetected vision disorder in Aboriginal children, University of Arizona researchers led by Dr. Joseph Miller launched the *Astigmatism and Amblyopia among Native American Children* (AANAC) study. The AANAC project aimed to: identify one of more effective and cost-efficient methods for screening preschool children for high astigmatism; determine whether refractive or meridional amblyopia is present in preschoolers with high astigmatism; measure whether prescribing glasses reduced refractive and meridional amblyopia at least two months later; and determine whether prescribing glasses for preschoolers with high astigmatism affects their visual acuity when they reach school age (Miller *et al.*, 2000). The target population was Tohono O’Odham preschoolers attending the Head Start

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<sup>5</sup> Astigmatism is an abnormal curvature of the clear outer covering of the eye (cornea) causing blurry vision. If left untreated, astigmatism can result in reduced visual acuity, poor school performance, refractive amblyopia, and meridional amblyopia (Miller *et al.*, 2000).

on-reserve program and first grade children who had attended the Tohono O’Odham Head Start prior to school entry.

The Tohono O’Odham Vision Screening Program is a collaborative research program conducted by the University of Arizona’s Department of Ophthalmology, sponsored by the Tohono O’Odham Nation, and funded by the National Institutes of Health/National Eye Institute (NIH/NEI). All Tohono O’Odham children from 6 months old to grade 1 that live on-reserve are eligible for the 2005-2010 programs. Children who are enrolled will receive free yearly vision screening up to three years of age or an eye exam for children over three. A variety of cost-effective screening tools are used in the community screening programs including: photorefraction, autorefractometry, autokeratometry, and Lea symbols visual acuity chart (Miller Dobson, Harvey, Sherrill, 2003). Children who were identified with astigmatism and required glasses were provided two pairs, one for home and one for school, at no charge. To date, the Tohono O’Odham PVS Project is the most comprehensive screening program for American Indian children in the US.

## **Australia**

### ❖ PVS Debate in Australia

Since early 2000, Australia’s Child and Youth Health Intergovernmental Partnership’s (CHIP) committee, a subcommittee of the National Public Health Partnership (NPHP), has been working to develop a National Child Public Health Strategy Action Plan. A key component of the plan is the establishment of mechanisms for the prevention, early detection and intervention of child health problems including visual acuity (CHIP, 2002). Using the National Health and Medical Research Council’s (NHMRC) 2002 report, *Child Health Screening and Surveillance: A Critical Review of the Evidence*, as a baseline document, CHIP determined that there is fair evidence to recommend against screening for risk factors for amblyopia and insufficient evidence to make a recommendation for or against preschool visual acuity screening (NHMRC, 2002).

Vision screening is currently carried out on an ad hoc basis by public health professionals and physicians in regular check up settings and in a number of early childhood education programs such as “Best Start” and “Families First” (CHIP, 2002).

### ❖ Vision 2020 Australia

Vision 2020 Australia is a joint initiative<sup>6</sup> of the World Health Organization (WHO) and International Agency for the Prevention of Blindness (IAPB) that brings together Australian organizations involved in local and global eye care service delivery, health promotion, education and development, vision rehabilitation, and eye research. Similar to the broader international initiative, Vision 2020 Australia seeks to eliminate avoidable blindness and vision loss by the year 2020 and serve as a national advocate for member organizations dedicated to this goal.

To support the Vision 2020 initiative, a *National Framework for Action to Promote Eye Health and Prevent Avoidable Blindness and Vision Loss* was developed in November 2005. The framework outlines five key action areas including: reducing the risk of eye disease and injury;

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<sup>6</sup> See full description of WHO Vision 2020: the Right to Sight in Section 3 of this paper

increasing early detection, improving access to eye health care services, improving the systems and quality of care, and improving the underlying evidence base. A background report, *Eye Health in Australia*, was released in 2005 to guide the national framework. The report provides an overview of the epidemiology of eye disease and injury, current treatments, and socioeconomic impacts of blindness and vision loss, as well as international and national policy considerations, insight into Australia's eye health workforce, major eye health programs and services, eye health research capacity, and related public health strategies (Department of Health and Ageing, 2005). In addition to Vision 2020, there are extensive eye health and vision care education and awareness campaigns across Australia, many of which are focused on Aboriginal and Torres Strait Islanders.

#### ❖ Aboriginal and Torres Strait Islander (A&TSI) Eye Health

In 1997, the Ministry of Health commissioned a national review of A&TSI eye health to document the changing epidemiology of eye disease and the appropriateness and efficiency of A&TSI eye health programs and services. The report found that the incidence/prevalence of visual impairment and eye disease was “unacceptably higher” in the Aboriginal population – in some cases ten times that of the non-Aboriginal population (Taylor, 1997; Layland, Holden, Evans, Bailey, 2004). In a 2004 review of Australian Indigenous eye health research, the most common conditions identified included diabetic retinopathy, cataracts, refractive errors, and trachoma and trichiasis (trauma) in predominantly adult and elderly populations (Yohendran J. & Yohendran K., 2004).<sup>7</sup> Approximately thirteen of the thirty-eight articles reviewed addressed issues surrounding service provision in rural and remote Indigenous communities (Yohendran J. & Yohendran K., 2004).

As in Canada and the United States, exposure to certain socio-economic risk factors associated with living in rural and remote communities is a key factor in poor Aboriginal eye health. Several studies have documented that Aboriginal Australians are reluctant to visit mainstream hospitals, community health centres, optometrists or ophthalmologists for vision care services for patient-practitioner related reasons, including intimidation and racism (Kaplan-Myrth, 2004; Hecker, 1998). Other barriers noted in the literature include a haphazard approach to vision care services in rural and remote communities, a lack of culturally appropriate services, poor eye health awareness, and a lack of follow-up (Taylor, 1997; Hecker, 1998; Kaplan-Myrth, 2004).

The health status of Australian Aboriginal children has also been subject to considerable research with nutritional and infectious diseases predominating in the literature (Thomson, 1991). Although Aboriginal children were found to suffer serious health problems at significantly higher rates than non-Aboriginal children, a 1998 evaluation of school screening programs in remote Aboriginal communities suggested that ongoing surveillance (continuous analysis, interpretation and feedback at an individual or population level) was more effective than a one-time pass/fail screening test. Importantly, the evaluation revealed that hearing is a far

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<sup>7</sup> See also: HR Taylor, “Prevalence and causes of Blindness in Australian Aborigines,” *Medical Journal of Australia* 26:1 (1980): 71-76; NP Stocks, et al. “Visual Acuity in an Australian Aboriginal Population,” *Australian and New Zealand Journal of Ophthalmology* 25 (1997): 125-131

greater problem (29%) than visual acuity (only 3%) in the Aboriginal children screened (Paterson *et al.*, 1998).

#### ❖ National Aboriginal and Torres Strait Islander Eye Health Program (NATSIEHP)

The 1997 report among others sparked the development of the National Aboriginal and Torres Strait Islander Eye Health Program (NATSIEHP) in 1998 – a regional model of eye health service delivery funded by the Australian Government. The program facilitates specialist access to remote areas and provides ophthalmic equipment in identified Aboriginal Community Controlled Health Services (Department of Health and Ageing, 2005). Major components of the program include the creation of Eye Health Coordinators (EHC) nationally within Aboriginal primary health care settings, provision of ophthalmic and optometric equipment in communities, provision of eye health training for regional EHC and Aboriginal health workers, and the development of guidelines for service in rural and remote settings (Department of Health and Ageing, 2005).

Within the NATSIEHP's program, two models of service delivery proved to be particularly successful: the International Centre for Eyecare Education (ICEE) /Aboriginal Health and Medical Research Council (AHMRC) model in which regional EHCs are trained in vision screening and provided screening tool kits to use in rural and remote communities, in preschools, schools and other locations (Layland *et al.*, 2004); and the Outback Eye Service Healthcare Unit's model which relies on a range of strategies including teleophthalmology (Taylor, *et al.*, 2003). Of the two, the ICEE model is perhaps the most applicable to BCI's preschool vision screening project. The program has three levels of service: training of Aboriginal EHC's and the provision of simple screening toolkits; a referral process and follow-up with an optometrist; and a follow-up with an ophthalmic surgeon if necessary. The program is supported by "community friendly" forms and culturally relevant health promotion materials (Layland *et al.*, 2004). Collaboration with Aboriginal community-controlled health services and local communities themselves has been vital to ensuring that each community's needs and sensitivities are met. The importance of community-controlled, holistic, and well-integrated eye health programs is also supported in other literature (Kaplan-Myrth, 2004). Although the ICEE program is confronted with numerous challenges, including high turnover rates of EHCs and of spectacles (due to loss and/or breakage), the program has proved to be sustainable.

#### ❖ Queensland University of Technology (QUT) School of Optometry

The School of Optometry at Queensland University of Technology (QUT) in Brisbane, Australia has developed a range of materials and services to promote eye and vision care in Aboriginal communities. Beginning in 1993, QUT established the Aboriginal and Torres Strait Islander (A&TSI) Optometry Clinic to provide primary eye care at the Aboriginal and Islander Community Health Service (AICHS) in Woolloongabba and to provide optometry students with an opportunity to work in a cross-cultural setting. At QUT's Centre for Health Research, researchers conducted a number of studies including: a survey of eye and vision care services to Indigenous communities (Wildsoet and Wood, 1996) a survey on the availability and utilization

of primary eye care in select Indigenous communities,<sup>8</sup> and a large scale national survey of the service provision of optometrists to indigenous communities. In addition to these projects, they joined forces with the School of Public Health to pilot train Indigenous health workers. Working in close consultation with Indigenous communities, the training sought to improve health workers' understanding of diabetes related vision loss. Using audio-teleconferencing technology, QUT also facilitated linkages between Australian optometrists by providing a forum to discuss common eye and systemic health problems in Indigenous communities, cultural issues, and management strategies for developing better professional relationships with communities.

For A&TSI patients, for whom English is a second language or who have poor literacy skills, visual acuity testing and evaluation based on English letter charts is problematic. Fear of not performing adequately on reading tasks can elicit feelings of anxiety that may deter such patients from seeking eye examinations (Wildsoet and Wood, 1996). The use of symbol charts for these populations also imposes certain cultural restrictions and can elicit feelings of cultural alienation. In an effort to overcome perceived inadequacies of conventional visual acuity testing for A&TSI, researchers from QUT's School of Optometry began work in the late 1990s on a culturally appropriate visual acuity chart. Although targeted primarily at A&TSI children, the chart was designed to be familiar and appealing across all ages of this population. After reviewing a range of traditional A&TSI icons, researchers chose a turtle, designed by A&TSI artist Douglas Watkin, both for its simplicity and its broader appeal to other indigenous groups such as American Indians.

The Turtle Chart was followed by a series of culturally appropriate eye care resources, including posters, brochures, videos and stickers on eye health and vision care topics from diabetes, cataracts, glaucoma, and age-related maculopathy to the importance of regular eye examinations. Specific colors and designs were chosen for their attractiveness not only to A&TSI, but also the wider community. All of the eye care resources were developed with input and advice from an Aboriginal artist and have been widely disseminated across Australia and internationally.

#### ❖ Visual Impairment Prevention Program (VIPP)

The VIPP pilot project targets impaired vision and blindness problems amongst Aboriginal Australians through the development of eye health promotional resources and the training of Aboriginal health workers. Funded by the Commonwealth Department of Health and Aged Care, the initiative began in 1999 in two health service regions in Southern Australia: the Riverland Regional Health Service area, a rural agency 250km from Adelaide; and the Ceduna/Koonibba Health Service area – a remote agency located 840km west of Adelaide in Ceduna (King and Baxter, 2003). The pilot was developed in four stages: a propositional stage where co-researchers engaged in consultation, a practical stage in which co-researchers jointly developed materials and curriculum, an experimental stage where co-researchers tested cultural appropriateness of materials and curricula, and a stage in which they attempted to 'make sense' of the experience through reflection (King and Baxter, 2003).

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<sup>8</sup> CF Wildsoet and JM Wood, "Primary Eye Care Needs and Services to Aboriginal and Torres Strait Islander populations across Queensland: A Users Perspective," *Clinical and Experimental Optometry: Journal of the Australian Optometrical Association* 79 (1996): 188-201

The development of promotion materials in the VIPP pilot is of particular interest to BCI. Eye health promotion brochures, flip charts, posters, curriculum, and training kits were developed by incorporating Aboriginal designs, photographs, language, and worldview. Evaluations of the pilot from the Aboriginal health worker participants suggests the materials were well received and deemed culturally appropriate because they were visual, interactive, inclusive of Aboriginal people and knowledges, the development process was grounded in consultation, and the materials were devoid of unnecessary medical jargon (King and Baxter, 2003).

### **3. World Health Organization (WHO) Vision 2020: The Right to Sight**

*Vision 2020: The Right to Sight* is a global initiative to eliminate avoidable blindness by the year 2020. Launched in 1999, Vision 2020 is a partnership between the WHO and the International Agency for the Prevention of Blindness (IAPB), an umbrella organization of eye-care professionals and NGOs. The initiative targets five key preventable or treatable conditions amongst marginalized groups and in the poorest regions of the world: cataract, refractive errors and low vision, trachoma, onchocerciasis, and a specific group of causes related to childhood vision impairments. Using community participation as an anchor, Vision 2020 aims to improve eye care services through vision screening, training, ensuring cost-effectiveness and access to equipment, and facilitating education and awareness (World Health Organization and International Agency for the Prevention of Blindness, 2004).

Vision 2020's Action Plan offers a step-by-step strategy for implementing eye health and vision care prevention and intervention planning processes at national, provincial or district levels including: how to assess current and past output of eye-care services, how to assess available human resources, how to assess available infrastructure and equipment, how to assess community participation, how to provide patient and community education, how to ensure sustainability, and how to build partnerships (World Health Organization and International Agency for the Prevention of Blindness, 2004). Vision 2020 has national bodies in Australia, India, Paraguay, Switzerland, UK, Netherlands and Afghanistan.

### **Emerging Themes**

Several themes have emerged in the development of the BCI environmental scan and literature review on PVS and Aboriginal eye health that can be of use to both the provincial screening program and BCI's pilot projects and KSTE activities.

First, although a direct cause and effect relationship between PVS and better long-term health outcomes has not been established in either the national or international literature, there is sufficient indirect evidence to support its implementation across BC. Indeed, new screening guidelines, methods, training, and equipment are constantly being revised to improve health outcomes and ensure BC's preschool population gets the best start in life.

Second, while the Ministry of Health has taken a sound evidence-based approach to the implementation of PVS in BC, the nature and scope of Aboriginal eye health and vision care services are problematic to a 'catch all' initiative. Research has demonstrated that Aboriginal

peoples in Canada and globally experience a wide range of barriers in the uptake of services including: access issues in rural and remote communities; a lack of culturally appropriate services; historical disadvantages such as colonization, racism, cultural alienation trauma; and socio-economic disadvantages like poverty, unemployment, housing insecurity, and transportation.

Third, there is very little data available on the incidence or nature of Aboriginal eye health and vision care in Canada, particularly among children and the Métis population. Aboriginal children are a vulnerable population for a myriad of reasons, and research indicates that there are significant gaps in their health status, most notably around dental and hearing problems. Anecdotal evidence suggests that vision disorders in Aboriginal children may be higher than that of the general population (<1 in 5) and may include the same types of deficits (amblyopia, refractive errors, strabismus), with the exception of astigmatism which is believed to be more prevalent.

Lastly, a review of the international literature suggests that Canada is well behind other countries in terms of addressing Aboriginal eye health and vision care services. Both the United States and Australia have developed innovative, Aboriginal specific, and community-controlled programs and promotion materials that can serve as important templates for BCI's KSTE work.

## **Recommendations**

The following recommendations are anchored in the research collected and synthesized in *Preschool Vision Screening and Aboriginal Eye Health: Implications for BCI*, and fall under the following headings: Knowledge synthesis, translation and exchange (KSTE); Pilot Project Development; Partnerships and Collaboration; and Consultation and Engagement.

### ❖ KSTE

- Since BC's Aboriginal population is extremely diverse, it is recommended that the principles of inclusiveness, respect, and relevancy be incorporated into all BCI's KSTE activities;
- Because BC's Aboriginal population is disadvantaged in terms of health status and health service delivery, it is recommended that KSTE activities emphasize specific barriers to eye health and vision care, including access to services, rural and remoteness, and other socio-economic determinants;
- It is recommended that KSTE activities, most notably the development of training and promotion materials, be holistic in nature in that they take into account all aspects of a child's health and requirements for optimal early childhood development (i.e. importance of vision, hearing and dental screening);
- It is recommended that KSTE promotion materials and training materials utilize a wide variety of media including posters, DVDs, brochures, and other means of communication deemed effective for Aboriginal audiences through dialogue;
- It is recommended that KSTE activities, particularly training and eye health promotion materials, target a wide range of audiences from early childhood educators, children, and parents/guardians to practitioners and professional associations;

- Given the quantity and quality of international eye health and vision care research, it is recommended that BCI look to international KSTE strategies and products as a model for the development of their strategies and products;
- It is recommended that KSTE strategies and products be developed in consultation with Aboriginal focus groups;
- It is recommended that BCI work with the Vision Steering Committee in either the modification of the draft training manual for Aboriginal lay screeners and/or work with the steering committee in the creation of an entirely new manual for Aboriginal screeners.

#### ❖ Pilot project development

- Given that the majority of information on Aboriginal preschool children’s visual acuity is based on anecdotal evidence, it is recommended that the data collected from PVS pilots be used to establish reliable baseline data for this population;
- Given that the Northern Health Authority is significantly larger than the other health authority regions, and that it faces specific rural and remote health service challenges, it is recommended that more pilots be conducted in this region; it is further recommended that the pilot template be developed in the north and rolled out to the other health authority instead of vice versa; and
- Given the “lack of evidence” surrounding Aboriginal eye health, it is recommended that BCI must work with Aboriginal focus groups and communities to understand local knowledge, needs and means to address these needs.

#### ❖ Partnerships and Collaboration

- Because AHS on-reserve and off-reserve already have a rudimentary screening protocol in place, it is recommended that BCI work with AHS to enhance existing screening practices, training and equipment;
- As the BCAO already has an effective, free eye health awareness campaign in place (*a-b-See*) and has expressed an interest in making the campaign more inclusive, it is recommended that BCI maintain linkages to the BCAO and use them as a resource in the development of promotional materials; and
- It is recommended that BCI maintain a strong working relationship with the vision steering committee and Health Authorities.

#### ❖ Consultation and Engagement

- It is recommended that a detailed environmental scan and literature review be conducted to examine culturally appropriate health promotion practices for PVS;
- It is recommended that BCI facilitate Aboriginal focus groups to determine what ‘culturally appropriate’ means and what it looks like on the ground;
- It is recommended that BCI convene a regional stakeholders forum; and
- It is recommended that BCI form an advisory committee with representatives from Aboriginal organizations, communities, the vision steering committee and Health Authorities.

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