



Preschool Vision Screening for Aboriginal Children in British Columbia: A NEEDS ASSESSMENT

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Table of Contents

Introduction	3
Background	3
Scope	3
Health Needs of Aboriginal Preschool Children in BC	4
Geographical Data	5
Basic Human Right to Access Health Care Services	7
Literature Review	8
Australia	9
United States of America	10
Sweden	11
Canada	12
Who Should do the Screening?	13
Challenges to Follow-up Care after Initial Referral	13
Conclusion	14
Methodology	14
Limitations	16
Content Analysis	17
Results	17
Cost as an Inhibiting Factor to Accessing Health Services	18
Limited Availability of Health Services On-reserve	18
Recommendations	19
Understanding of Aboriginal World View	20
Education	22
Initial Training Goals	22
Long Term Training Goals	23
Sustainability	23
Scope and Scale of Knowledge Translation Pilots	24
Challenges of Initiative	24
Project Evaluation	24
Vision Screening in Practice	25
Summary	26
References	28
Appendix A – BCAA List of Practicing Optometrists, Satellite Offices & Health Authority Region	31
Appendix B – Phone Survey Guide	42

Introduction

The purpose of this report is to examine the vision needs of Aboriginal (First Nations, Inuit, and Métis) children on and off reserve throughout British Columbia under the age of six. Children are the foundation of our society and with 246,000 children under the age of six in British Columbia, their future health is determined by services they access when they are young (<http://www.mcfcd.gov.bc.ca>). Inequalities in health care services and socio-economic status may hinder their development and negatively impact them throughout their lives. The Aboriginal population in Canada reports poor health outcomes when compared to the general population (Health Canada, 2005). Socioeconomic status, poor education, and access to services have been identified as barriers to health (Kelm, 1998).

Background

The Aboriginal preschool vision screening 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, the preschool vision screening program seeks to optimize critical periods of early childhood development through universal vision screening for amblyopia (lazy eye), strabismus (crossed eye), and refractive error, 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 (Ministry of Health, 2005).

In 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 an Aboriginal-specific preschool vision screening strategy. The program is hosted by the NCCAH under its BC Initiatives (BCI) stream. The NCCAH is one of six National Collaborating Centres funded by the Public Health Agency of Canada. In partnership with the First Nations Health Council (FNHC), the Provincial Preschool Vision Steering Committee and the Human Early Learning Partnership (HELP), BCI is working to develop innovative, culturally appropriate, and sustainable approaches to vision screening for Aboriginal preschool children in BC.

Scope

This document identifies the vision care needs of the Aboriginal population 0-6 throughout BC. The aboriginal population has been broken down into health authorities that include Northern Health, Interior Health, Fraser Health Authority, Vancouver Island Health Authority, and Vancouver Coastal Health. Furthermore, service availability and service need specifically to vision screening is discussed. On a broader scale, services identified by community health representatives that they consider necessary on reserve have also been highlighted.

The format of this report includes background information on the Aboriginal population in British Columbia, an overview of pilot projects that have been implemented internationally, the methodology used by BCI to collect and analyze data, and recommendations made based on the analyzed information.

Health needs of Aboriginal preschool children in BC

This section will examine the health needs of Aboriginal preschool children in BC including population dynamics, geography, and accessibility of vision services. As there is limited data available on Métis and urban Aboriginal children, the report concentrates specifically on First Nations children.

British Columbia is home to the second largest Aboriginal population in Canada (Stats Canada, 2006).¹ 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 (1655 or 0.8%), and other Aboriginal peoples not included in the other categories (4605 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 (Stats Canada, 2006).

There are approximately 206 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 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 Stats, 2001). There are 206 First Nations communities in British Columbia, and the majority of these communities are considered to be rural and remote and/or isolated. The population ranges between 15 to 2,500 per community, and the average community reports approximately 150 members living on reserve year round. .

Indicators of health for the First Nations population demonstrate that for every health condition and measure, the health of First Nations is worse than that of the overall population (Health Canada, 2005). There are several reasons for this disparity in health outcomes which include socioeconomic status, the legacy of residential schools, and colonial influences (Kelm, 1998). Geographic location, which impacts access and availability of health care services, is another consideration for health outcomes and is a factor that will be the focus of this report.

¹ 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.

As a result of geographic location, many First Nations communities have limited access to health services. A number of communities have the services of a full time public health nurse, while the majority shares services with neighbouring bands (Wardman, Clement, and Quantz, 2005). Physicians visit communities either weekly or monthly to provide primary care, but overall care is the responsibility of support staff on reserve. Accessing other health services such as vision, dental, or hearing screening, are based on referral by the doctor/nurse or by the community health representative/Aboriginal liaison worker who arranges appointments in neighbouring cities. Ease of access is dependent on associated costs, weather conditions, cultural appropriateness of service delivery, comfort level of those accessing the health service with the service professional, and being aware of the importance of obtaining the health service (Wardman, et al., 2005).

Challenges specific to delivering health care services to First Nations communities include knowledge translation, lack of community capacity, and the cultural appropriateness of service delivery. Health care services do not focus on treatment alone but emphasizes prevention, diagnosis, continuing care, and rehabilitation. These issues must be addressed when considering the delivery of services to the Aboriginal population.

Geographical Data

Statistics Canada 2006 reported 51,060 First Nations living on reserve in British Columbia, with 4,230 being between the ages of 0-5 years which is approximately 12% of the total on reserve population. The following table provides Statistics Canada population counts for the 0-5 population for Aboriginal, Inuit, and Métis children in 2006.

Table 1: 2006 Census data Aboriginal Identity for British Columbia by Age Cohort 0-5 years and by Residency

Age: 0 - 5 years

British Columbia	Total - On/off reserve status			On reserve			Off reserve		
	Total - Urban-rural	Urban	Rural	Total - Urban-rural	Urban	Rural	Total - Urban-rural	Urban	Rural
Total Aboriginal population	18735	12235	6505	4985	935	4035	13755	11290	2475
North American Indian identity only	13905	8485	5435	4730	870	3865	9170	7600	1565
Inuit identity only	115	120	10	0	0	0	125	120	0
Métis identity only	3980	3140	830	60	10	20	3935	3130	815
Multiple Aboriginal identity	140	110	25	0	0	0	130	105	35
Other	580	380	195	200	30	150	380	335	55

Source: Statistics Canada 2006 Census of Canada. INAC Core Tabulations T5A

For the purposes of this report, the bands in BC have been grouped according to which health authority had responsibility for service provision so that comparisons could be made between services available in each area, where patients access health care if not available in the immediate area, and where communities are geographically situated in relation to main service centres. Health authorities keep records of the total population they serve. This enables us to compare population statistics and geographic accessibility, as well as identify service areas for the specific regions.

Within the Northern Health Authority, there are 52 bands, of which 27 are located within the Fraser Health Authority and 49 within Interior Health; 15 bands are within the Vancouver Coastal Health Authority; and 50 bands are within the Vancouver Island Health Authority.

Basic Human Right to Access Health Care Services

The Aboriginal population throughout Canada is the most disadvantaged and show poorer health outcomes than the general population (Health Canada, 2005). At the same time, they also have limited access to health care services and even when services are available, they are used sporadically. This is often due to feelings of discomfort in a medical setting (Browne and Fiske, 2001), limited access to appointment times that coordinate with personal schedules, inability to access services that are not provided within their community, or socioeconomic limitations that prevent access to services.

There are pilot projects initiated by the provincial government that target improving access to health services throughout BC which are inclusive to the entire population. However, there are many reasons for why First Nations people continue to be excluded including language barriers, literacy, access, and cultural appropriateness of service delivery. As a result, many First Nations children living on reserve or in rural areas may not receive health services despite current efforts to ensure inclusion. Significant changes are required to ensure all Aboriginal children have access to culturally appropriate and competent health services. Culturally appropriate health service delivery encompasses the diversity of individuals, families and communities (NAHO, 2008). In a health care context, culturally appropriate services also refer to acquiring knowledge of and sensitivity toward a patient's culture and applying this information to provide the best health care possible (Stewart, 2006). Culturally appropriate health services are respectful of and responsive to cultural needs (IQ Solutions, 2001).

The following points outline key considerations that address culturally appropriate care:

- Ensure there are on reserve clinics. This may include a physician traveling to the community on a regular basis which would ensure easier access to health care services. It may also include advanced training of support staff on reserve in vision, hearing, and dental screening in order to reach a broader population base. A number of communities had the health care service facilities but these facilities were un-staffed. Provision of training for the on reserve population is essential in making full use of these amenities.
- Many people in rural and remote communities cannot access vision care with an ophthalmologist (eye surgeon) or optometrist (primary eye care provider) due to their geographical distance from service centres. Travel time varies between 15 minutes by float plane or boat to a 20 minute drive to a 7 hour journey by ground transportation. The longest travel times are found within the Northern Health region. In response to this limited access, Northern Health has implemented a medical bus service that transports patients from rural communities to medical appointments in urban centres. This program is still in its infancy and does not target isolated communities. Carrier Sekani Family Services also provides medical transportation vehicles for communities that apply and qualify for this paid service. Although these programs do not cover all bands in all remote areas, it is a progressive way of thinking and would benefit from expansion.

- Ensure adequate funding for health care services. This may include partnering with independent agencies to ‘piggyback’ on the services that agency provides or securing core funding for the specific needs of each community.

Literature Review

This section will provide an overview of some of the literature around vision screening as well as the strengths and challenges of current vision screening pilot projects underway internationally.

Prevent Blindness America states that one in 20 preschoolers and one in four school aged children have a vision problem but are unaware they see the world differently than other children (Prevent Blindness America, 2008). Likewise, vision problems left untreated can result in permanent vision loss and learning difficulties. Strabismus (crossed eye), amblyopia (lazy eye), and refractive error are vision problems which are typically found in children in the general population and are time sensitive if not diagnosed and treated in early childhood. The First Nations population, who may not have regular access to health services, is at a higher risk of untreated vision problems and would benefit from regular screening clinics in an attempt to improve long term visual outcomes.

Although vision statistics for First Nations children in BC are not available, amblyopia is present in about 1 child per kindergarten class in the general population (Hered, 2006) and may be even more prevalent within the First Nations population (Goss, 1990). Once amblyopia has been detected, it is highly treatable. However, without treatment, vision loss is inevitable (Quinn, Beck, Holmes & Repka, 2004). A review of the available literature outlined several challenges to the detection and treatment of eye problems, including lack of access to eye screening programs (Layland, Holden, Evans, & Bailey, 2003), ineffective screening methods (Miller, Dobson, Harvey, & Sherrill, 2001), and lack of continuity in children who fail screening tests for follow up exams and treatment (Kemper & Margolis, 1999). Benefits to screening programs include increased access to services and the identification of the need to address culturally appropriate modes of service delivery (Kaur, Maberly, Chang & Hay, 2004; Barton, Anderson & Thommasen, 2005; Purden, 2005; Tillman, 2002; Minore & Boone, 2002).

Although there has been a lack of research in vision health in BC First Nations, eye screening programs involving American Indians/Alaskan Natives in the US (Miller, et al., 2001) and Australia (Layland, et al., 2003) have been implemented. In addition, screening programs involved in the detection of other health problems, such as ear infections (Ayukawa, Lejeune, Proulx, 2003) and dental health (Harrison, MacNab, Duffy & Benton, 2006), have been performed within the Canadian First Nations population. The findings of each of these projects are summarized below in order to establish the benefits and challenges faced by these pilot projects and consider these challenges in the development of a vision screening project for British Columbia. While this literature review in no way covers the vast number of pilot projects undertaken in rural and remote communities, it does provide invaluable information on gaps in service

delivery, the need to deliver culturally appropriate health care, and to outline the benefits and challenges of delivering health care services to rural and remote communities worldwide.

Australia

It is well known that there is a broad range of factors that impact the general health status of Aboriginal people in Canada as well as Australia and New Zealand. In Australia, the International Centre for Eyecare Education (ICEE) is a non-profit organization that provides worldwide eye care to under-served Aboriginal areas. Brian Layland, the ICEE director of the NSW Aboriginal & Torres Strait Islander Eyecare Program, outlined the key to the success of his program:

Working through and with Aboriginal community-controlled health services, and harnessing business, State, Federal, community and professional organizations and individuals has ensured that the services are well accepted by the community – feedback from our patients has been very enthusiastic – and that the services will be sustainable (ICEE-AMS, 2005, p. 2).

The report discusses how Australian Aboriginals experience preventable blindness at 10 times the rate of non-Aboriginals but see eye care professionals less often than average. The study cited challenges such as financial factors, lack of eye health knowledge, lack of follow up, and culturally and geographically inaccessible services. Aboriginal Eye Health Coordinator (EHC) positions were created and these workers were trained by ICEE to perform eye health screening. EHCs were given an eye screening kit to perform screening in schools, preschools and other communities, as well as to teach others how to carry out screening techniques. Those who failed a screening test were referred to an optometrist at the nearest Aboriginal Medical Services (AMS) centre. If the patient required treatment or referral to another health practitioner, the EHC assisted the optometrist with the logistics. If glasses were needed, they were provided through “community friendly” forms within the VisionCare NSW program.

This program has been very successful, with a high usage rate indicating acceptance among the Aboriginal communities. The Aboriginal Health and Medical Research Council has stated that it is “one of the most successful of any of the Aboriginal health programs in their services” (Layland, et al. 2003). The success of this program was the result of collaboration between various government agencies, local communities and Aboriginal organizations. For example, in one clinic the local government, the NSW Department of Community Services, the ICEE and the AMS pooled their resources and provided the necessary equipment, training, and funding for clinic operation. Medicare paid for the eye examination and VisionCare NSW supplied the spectacles (Layland, et al., 2003). Other reasons contributing to the success of the program were solving financial challenges by offering bulk-billing and funding eyeglasses; cost effectiveness of the program through the use of EHCs; a referral system which ensures that only those patients who require more costly ophthalmic examinations receive them; the

implementation of an appropriate recall program to ensure continuity of care; the use of local optometrists wherever possible to increase stability in patient-professional relationships; and regular service visits to serve smaller, more remote communities.

In summary, the report suggested that programs such as these should be controlled, organized and delivered by the local Aboriginal communities; coordinated by the local EHC; serviced by local optometrists as often as possible; have low-cost eyeglasses provided on-site; have regular, organized visits to remote communities; and cooperation from general practitioners and other health care professionals should be obtained. Challenges identified with the current program included limited access to very remote communities; training and retention of EHC workers; challenging maintenance of patient continuity brought about by frequent moving of patients from community to community; and high rates of lost or damaged glasses. Possible future directions for the program included the development of an eye health clinic which visits remote communities for one week per month, as well as expanding upon current services in underserved but larger communities.

United States of America

Project Universal Preschool Vision Screening is a large scale vision screening pilot project involving four sites in the United States (Hartmann, et al., 2006). The ultimate goal is to develop model programs which could be implemented throughout the US. Screening was performed by either lay volunteers in community-based settings or by physicians or nurses in primary-care settings. Three and four year old children were screened and, if they failed initial testing, they were referred to an eye care specialist who provided diagnosis and/or treatment. Early care and education settings such as Head Start programs were used to conduct screening.

The project found that community based screening was more likely to result in a referral to an eye care specialist. Community based screening resulted in a referral rate of 31% of 3 year olds and 28% of 4 year olds compared with 4% and 5% screened by primary care providers. Another important finding of the study was that 94% of 4-year olds were screened successfully, but only 80% of 3-year-old children were screened successfully. They suggested that screening of 4 year old children may be sufficient for preventing eye disease while being more efficient due to higher screening success rates. As well, the lower referral rates from primary care providers were hypothesized to result in decreased detection of amblyopia. This project also identified low follow-up rates; 56% of children who were referred for further testing were not tested. They suggested that eye care specialists should inform the child's primary health care professional to keep a central record of the referred screening test and to promote follow up care when possible.

Four main recommendations resulted from this study: 1) increased continuing education for primary care providers and lay screeners, 2) periodic certification and recertification of individuals conducting eye screening, 3) Identification of challenges in referral from health care professionals to eye care professionals, as well as for follow up examination

for those children who did not pass initial screening, and 4) improved communication between eye care specialists and primary care professionals.

The Astigmatism and Amblyopia among Native American Children (AANAC) study is another example of a vision pilot project in the US that was undertaken with the Tohono O'odham Nation located in south-central Arizona (Miller, Dobson, Harvey, Sherrill, 2000). Astigmatism, a distortion of the image on the retina caused by irregularities in the cornea or lens, was measured in children aged three to four years attending Head Start programs. Owing to high rates of astigmatism within many American First Nations (Goss, 1990), the goal was to achieve early detection in young children. Screening methods included the use of the Marco Nidek KM-500 autokeratometer, the MTI photoscreener, the Nikon Retinomax K-Plus autorefractor and the Lea Symbols acuity chart. Glasses were provided to children diagnosed with astigmatism. Short and long term follow up was implemented to evaluate effectiveness of treatment. The study group was compared with a control group which consisted of children who were in the Head Start program before initiation of the study.

The authors of the study stated that the increased rates of astigmatism within the Native American population may result in reduced school functioning. Other studies have noted that acuity in Tohono O'odham Nation children is below 20/20 in 16% of 4th and 5th grade children versus 2% in non-Native children. The goals of this research project were to identify cost effective methods of performing screening; to distinguish if children had amblyopia; to evaluate the effectiveness of glasses on reducing amblyopia after 2 months; and to determine how glasses impact visual acuity by the time children enter school. These authors reported that astigmatism in the Native American population is more often corneal (curvature on the surface of the eye) and not lenticular (astigmatism caused internally by the lens of the eye) and for this reason, the Nidek KM500 was chosen as the most effective screening tool.

Sweden

Sweden has some of the most advanced and comprehensive preschool vision screening programs in the world. Considerable research has been done in regards to the evaluation of their national screening protocols. Lennerstrand & Rydberg, (1996) conducted such a study and made 5 recommendations regarding the development of vision screening programs. They suggested that:

- 1) An ophthalmoscope should be used on newborns to inspect the eyes and examine the red reflex.
- 2) High risk children (i.e. premature) should be examined at the correct age by an ophthalmologist.
- 3) Staff in pediatric settings and childcare centres should be trained in the recognition of symptoms which indicate a possible vision problem.
- 4) With correct training, screening 4-year-old children for monocular visual acuity (visual testing of each eye individually) can be accurately performed by non-professionals.

Screening should be repeated by school nurses in the first year of school and at regular intervals thereafter.

5) Children with a positive screening result should be examined by an ophthalmologist, optometrist or orthoptists in a timely fashion for diagnosis and treatment.

Similar studies in Sweden have demonstrated that detection and treatment for amblyopia is highly accurate and effective if screening is performed in 4 year olds (Lennerstrand & Rydberg (1996). They concluded that the rate of untreated amblyopia in the population has been kept low by early detection through participating in screening programs offered by eye care professionals.

Canada

With the increasingly high incidence of type II diabetes in the First Nations population, vision screening pilot projects are used in the management of diabetes. Diabetic retinopathy (DR) is an associated eye condition in diabetics and is the leading cause of blindness in patients under 60 years of age (National Eye Institute, 2008). In order to evaluate the status of primary care for patients with diabetes and for diabetic retinopathy screening, a mail-out survey was sent to all First Nations communities in BC (Kaur, et al., 2004). The 26 item questionnaire had a response rate of 67%, and results showed that the vast majority of First Nations people do not receive annual examinations by an eye care professional and that eye evaluations and retinal screening were often the responsibility of the individual. Kaur et al (2004) recommend that annual vision screening is an appropriate mode of service delivery, is cost effective, and is invaluable for increasing remote communities' access to eye health care.

Although there is a shortage of research involving vision health in the Canadian First Nations population, studies evaluating screening programs for hearing problems in Canadian Inuit have been done. Otitis media, or inflammation of the middle ear, has been found to be relatively prevalent within the Inuit and Canadian First Nations populations (Ayukawa, Lejeune & Proulx, 2003). In his review of hearing screening programs in the Arctic, Bowd (2005) suggested that the rate of detection of hearing problems varied widely from study to study due to variations in sampling by age, screening methods, disease definitions and other methodological issues (Bowd, 2005).

Within the context of screening for hearing impairments, Bowd (2005) cited cultural issues in the delivery of such screening programs which may affect treatment outcomes. Cultural issues identified by Bowd include communication problems due to language, conflict between traditional and Western treatments, lack of community based implementation strategies, inappropriate terminology usage, and differing models of disease. He suggested that successful implementation of pilot projects depends upon engagement with the community where the project is proposed. Additionally, public health programs focus on the future consequences of health problems, whereas Aboriginal culture is more focused on the present. Likewise, Aboriginal culture places a high regard on harmony within nature. He suggested that involving the entire community and avoiding terminology which alludes to 'battling' a disease are both ways

of maintaining harmony within a public health intervention. Furthermore, the biomedical model upon which Western medicine is based is fundamentally different from the Aboriginal epistemology. The Aboriginal approach to disease is more holistic, “linking individual, family, community and the environment (Bowd, 2005, p. 11)”. Therefore, Bowd (2005) recommends that sustainability of any program must incorporate the Aboriginal belief system in project development and implementation.

Who Should Do the Screening?

Studies investigating the efficacy of screeners with varying levels of education have been done. Hered (2006) suggests that physicians are the best choice due to the large numbers of children missed by screening programs. He also argues that screening programs are not effective due to low follow up rates. Parents are more likely to understand the importance of follow up exams when the orders are given by a physician. However, physicians are hampered by issues such as lack of cooperation from children and over booked schedules (Kemper, Uren & Clark, 2006).

Studies involving the use of non-professionals to perform screening have also been done. Within the Aboriginal population in Australia, this model has been utilized within the highly successful ICEE-AMS program (Layland et al., 2003). Local community members trained in screening methods were considered to be more approachable and culturally accessible than visiting health professionals. Also, a combination of trained and untrained screening personnel was used in the study with success on all levels of expertise. Other studies found that the use of the MTI Photoscreener was effective in screening preschoolers by a team of volunteers (Donahue, Johnson & Leonard-Martin, 2000). Photos were taken by volunteers and sent to be evaluated by eye health professionals at a central ophthalmic clinic for evaluation.

Overall, while the optimum service would be annual vision testing by an optometrist or ophthalmologist, it is often not practical. Travel time, overbooked schedules, and lack of human resources are challenges faced by these professionals. For these reasons, it is both economical and feasible to employ lay people who are trained in vision screening to monitor vision concerns. These employees are trained to identify visual disturbances and can arrange for follow up examination with an eye care professional when necessary.

Challenges to Follow-up Care after Initial Referral

One challenge to obtaining diagnosis and/or treatment by an ophthalmologist or optometrist is the lack of follow up examination after referred screening tests. Kimel (2006) investigated reasons why follow-up did not occur after vision screening exams were performed. Within an inner city population in the US, barriers to obtaining follow up eye exams were financial, social or family, logistical and perceptual. Financial challenges included lack of insurance. Social/family barriers included lack of time to take children to exams, parental disability, having a large family, and changing residence. Lack of a telephone, no access to a vehicle and the inability to plan ahead were some logistical challenges cited. Perceptual challenges included parents not

believing that the child had a problem and lack of knowledge regarding eye health. Within the Aboriginal population, lack of cultural appropriateness, financial challenges and geographical challenges have been cited as reasons continuity has not been achieved (Layland et al., 2003).

Conclusion

Pilot vision screening projects have been implemented on an international level. Some of the challenges these projects reported are limited or no access to remote communities, low follow up rates, and little consideration given for geographic location. That is, linguistic, social and cultural considerations should be taken into account with program development to ensure a culturally sensitive approach to health care. The benefits that have been identified in these projects are that partnership with agencies and community organizations such as Head Start Programs were successful, and that screening methods were considered efficient and cost effective for four year olds.

These findings are in keeping with the advantages and challenges one would expect to find in the First Nations population in BC. While all these projects are not vision specific, review of these projects aid in program development that can identify specific needs in health care service delivery in the BC Aboriginal population.

Methodology

The goal of this needs assessment report is to examine services either present or required to improve access to pre-school vision screening for Aboriginal pre-school children throughout British Columbia. In order to achieve these goals, the following tasks were completed:

- 1.) A list from Statistics Canada of the number of on reserve, urban, First Nation and Métis population in BC was compiled.
- 2.) A list of all reserves in BC along with contact information for community health representatives and/or public health nurses in each community was compiled.
- 3.) All community health representatives for each band in BC were contacted and asked to contribute information on current services provided as well as services that are needed (i.e. visual, hearing, developmental assessments).
- 4.) A comparison of Statistics Canada information with information collected directly from community health representatives was made. Gaps were identified and lists were updated.
- 5.) The number of children under six years of age in each community was identified.
- 6.) Areas currently served by British Columbia Association of Optometrists (BCAO) members were mapped and juxtaposed against Aboriginal communities to determine gaps in BC AO services.
- 7.) Specific challenges/barriers to Aboriginal uptake of services were reported.
- 8.) Recommendations were made for screening programs, promotion materials, and education models.

Collection of information commenced on March 2008 and included compilation of data from Statistics Canada for the on reserve Aboriginal population in British Columbia. Information was also collected on urban, Métis, and Inuit populations using the Statistics Canada website. Once this information was collected, it was entered into a spreadsheet which served as a working copy throughout the project.

A Guide to Aboriginal Organizations and Services in British Columbia 2005/2006, which was distributed by the Ministry of Aboriginal Relations and Reconciliation, was invaluable for the information it provided on the individual bands and their contact information. This guide served as the template for the band list. To verify the information in this report, cross-reference was made with the Community Health Associates of BC: Aboriginal Health Services Directory for British Columbia 2004. This document confirmed band status and provided the names of community health representatives (CHRs) and/or public health nurses (PHNs) that serviced each reserve. Where possible, contact names for CHRs and PHNs have been updated and added to the spreadsheet. Once the band name, address, and contact information was collected for each community, a final list was drafted.

The second step was to collect information on the service availability and service requirements for each band. A list of questions was developed and confirmed for accuracy and completeness with Harold Tarbell of GASPE Tarbell and Associates, consultant and BC Initiatives for Aboriginal Health project advisor, prior to contacting each community.

After the data was collected and deemed as complete as possible, a comparison of Statistics Canada information was made with information collected directly from the communities. The purpose of this task was to validate the population numbers, to ensure we included people who might have been missed during the census taking process, and to update the list which was from 2004.

Mapping the areas that are currently served by BCAO members and juxtaposing this information against Aboriginal communities to determine gaps in BCAO services was the next step in this needs assessment. The BCAO provided a list of practicing optometrists, complete with their location and any available information on satellite offices (Appendix A). Table 2 outlines the breakdown of practicing optometrists in the various health authorities, as well as the number of satellite offices.

Table 2: Practicing Optometrists in Health Authorities

Northern Health	48
Interior Health	114
Vancouver Island Health Authority	112
Vancouver Coastal Health	154
Fraser Health	119
Satellite Offices (total throughout province)	32

This information was digitally mapped in order to use as a visual tool for future reference. Appendix B also highlights the number of optometrists practicing in each health authority. It is evident from this mapping exercise that the majority of optometrists are located in the southern part of the province (Fraser Health Authority, Vancouver Island Health Authority, Vancouver Coastal Health, and Interior Health), while the northern portion of the province (Northern Health) has minimal optometric services for its geographic diversity. Based on these findings, travel time for optometric care off reserve is minimal in the southern regions compared to the northern part of the province. Access to vision services off reserve in the north is considerable and in some cases, preventative to receiving vision care.

Based on this data collection and analysis, recommendations have been made on improving and/or implementing preschool vision screening for the rural, remote and/or isolated Aboriginal population.

Limitations

Phone calls were placed to community health representatives (CHRs) and/or public health nurses (PHNs) for all First Nations reserves in British Columbia. While everyone was given equal opportunity to participate in this survey, not all people chose to respond. Overall, of the 206 registered bands, 198 are active: 145 bands responded, 49 bands did not respond, and 4 bands were in transition. Furthermore, the population counts are realized where possible but are also dependent on Statistics Canada counts from 2004.

Another limitation included the information provided by the BCAA. Two lists were provided by the BCAA for this needs assessment. The first list included all practicing optometrists in British Columbia and their main office sites. The second list included practicing optometrists who also have satellite offices on reserve. These lists were reviewed to confirm accuracy, and it was deemed to have a minimal number of overlapping names and service areas. While attempts were made to clarify the information, contact was not made. Therefore, the list of optometrists is the most accurate available for this project.

The final limitation to this project was the collection of population numbers. The numbers obtained from community contacts sometimes varied considerably from that

reported by Statistics Canada. The reasons for this discrepancy may include the time of year the Census was taken or the merger of some bands and devolvement of others. Also, Statistics Canada may represent estimates or projections rather than true accounts. Numbers collected by phone interviewers were not merged, suppressed, or estimated in any way. Furthermore, Statistics Canada reports on children aged 0-5 while this project focused on children aged 0-6. This may account for a slight variation in final population counts.

These limitations did not negatively impact the outcome of this needs assessment, but were considered throughout the analysis process.

Content Analysis

Prior to the collection of information, a scheme was developed to classify information in order to count themes and ideas, and to sense sequences or patterns. To this end, a spreadsheet was developed that included the band name and contact information, the health authority they fell under, the list of questions they were asked, population numbers (both from Statistics Canada and directly from respondents), and any other comments or issues the respondent introduced to the conversation.

As information was compiled, it was added to the spreadsheet for comparison purposes. Once this process was complete, summary tables were developed that included the total information collected. These tables are a useful tool and are reported in the results section of this assessment.

Another source of analysis was the examination of published articles and reports. This process aided in the assessment of projects that have been completed in vision screening and other health care pilot projects delivered to Aboriginal communities.

Results

As mentioned in the Methodology section of this report, CHRs and/or PHNs were contacted from the 206 registered bands throughout British Columbia. The purpose of this telephone survey was twofold: first, confirmation of population was established in order to update the information provided by Statistics Canada in 2006. Secondly, information was collected in order to establish services the individual communities felt they needed in regard to both vision services and other health services. The questions asked to the CHRs and/or PHNs in 145 First Nations communities throughout British Columbia are provided in Appendix A. The responses are provided below in Table 3.

Table 3: Survey Responses

Vision services available	70
Distance travelled to access services	20mins – 7 hours
Respondents who felt vision services are necessary	114
Respondents who felt dental/hearing services are necessary	80
Other services required	70
Head Start programs on reserve	67

Based on the responses from questions one to three, two main themes emerged:

- cost as an inhibiting factor to accessing health services
- limited availability of health services on-reserve

Cost as an inhibiting factor to accessing health services

Many respondents indicated that they had to travel considerable distances to obtain health services that were not available in their community. Reported travel time varied between twenty minutes and seven hours depending on geographic location. One of the determining factors of people receiving services in neighbouring communities was access to travel funds. Many people said that they did not have funding for transportation, and community members could not afford travel to access health services. Others stated that the majority of people in the community did not own a vehicle and needed to depend on friends or relatives for transportation. People suggested that a fully funded medical vehicle would assist people in accessing health services.

Limited availability of health services on-reserve

The majority of the contacts we spoke with felt that there were not enough health services to meet the needs of the community. While some communities felt they received adequate health services, the majority stated that they had no services or they did receive services but they were sporadic and not easily accessible. For example, 70 communities reported to have vision services but only 21 reported continual care. The remainder reported irregular clinics or none at all.

Of the 145 communities we successfully contacted, only 9 stated that they did not require vision, hearing, or dental services, and this was either because of the small number of children living on reserve or their geographic proximity to city services.

Based on the responses from questions four and five, it was determined that all communities reported to have different population counts than that reported by Statistics Canada. This difference of approximately 10% can be accredited to the lag time between the Statistics Canada numbers which were reported in 2006 or due to under-reporting of population counts from individual communities. For example, Statistics Canada reported 58,717 total population with 4,985 children 0-5 on reserve and 13,755 children 0-5 living off reserve. When each community was asked for their population counts (on reserve only) the numbers reported were 61,636 total population and 5,422 children 0-5 on reserve.

During telephone conversations with community contacts, they often stated additional services are needed in their community but are inaccessible. Table 4 identifies services that are needed and the number of communities who requested these services:

Table 4: Services on reserve needed but inaccessible

*Please note that the difference in Table 3 and Table 4 reporting reflects interpretation of the questions. Respondents often stated the service was not necessary if it was already available to them.

Recommendations

Self-reported services needed on-reserve	communities who requested this service
Dental *	73
Hearing/Audiologist *	59
Medical transportation funding	4
Maternity services	2
Increased hours for dentist	1
Bring clinics onto reserve	1
Daycare	1
Podiatrist for diabetics	1
Dental education	1
Funding for eyeglasses	1
FASD services	1
Nutrition programs	1
Pre-school	1
Youth coordinator	1
Prenatal examination and follow-up	1

The following recommendations are based on the information collected from the telephone survey. The literature review has also contributed to these recommendations which fall under the following headings:

- Understanding of Aboriginal world view
- Education

- Initial training goals
- Sustainability
- Scope and scale of knowledge translation of pilot projects
- Challenges of initiative
- Project Evaluation
- Long term training goals
- Vision Screening in practice

Understanding of Aboriginal World View

- Health services should be holistic, respectful, and culturally appropriate. To this end, health care professionals should be trained in working with Aboriginal communities or be Aboriginal themselves.
- Elders should be engaged in the development of culturally sensitive approaches to health care delivery. They are often the leaders in their communities, well respected, and the most knowledgeable in traditional ways of knowing.
- A holistic approach to health care services from prevention to treatment should be developed that recognizes the Aboriginal world view. This can be obtained by consulting with community leaders early in the development process to ensure the needs of the community are being met in a culturally appropriate way.

Comprehensive and coordinated vision screening delivery

- Service provision should be culturally sensitive while considering the western model of health care that is being incorporated in the community.
- People should be advised of the mode of delivery prior to their consultation so they are comfortable with the process.
- This comprehensive approach should be delivered from the community staff, support staff (CHR or PHN), or Aboriginal vision screeners.
- Service delivery should be provided by health professionals who are aware of the specific needs of the Aboriginal communities and individuals they serve and be respectful of their culture. This may include employing Aboriginal professionals and/or non-Aboriginal professionals who are experienced in working with the Aboriginal population.
- There should be collaboration, coordination, and active communication between the individual communities and those who are delivering health care services. Opening pathways of communication aid in identifying the needs of the community by the community members themselves. Health care delivery must be context specific, while building upon programs that have been successful elsewhere.

Community Control

- It is recommended that the communities be engaged prior to the commencement of any clinics to ensure the needs of the community are being met and that community leaders are a part of the decision making process.

- People in the communities should be given the choice if they want their children screened in a pilot project. If they do not wish to be involved, every effort should be made to ensure they access services outside their community.

Partnerships

- It is recommended that partnerships in dialogue and shadowing opportunities for vision screeners be developed with ophthalmologists, orthoptists, and optometrists to ensure training is compatible with the standard guidelines of these professions.
- Further partnerships should be established with optometrists in an attempt to expand satellite office locations, address the need to deliver culturally appropriate services to Aboriginal communities, and to work with BC Initiatives for Aboriginal Health in order to develop and implement vision care service delivery programs.
- Partnerships should be developed with community programs already in place in order to access the broadest range of children possible. This partnership will be better served if the organization or agency is first educated about the project and are aware of the advantages of being involved.
- It would be advisable to partner with the Aboriginal Health Start (AHS) Programs throughout British Columbia for successful implementation of pilot projects. AHS programs are established providers of child care and are widely accepted in Aboriginal communities. The staff at AHS are well trained, offer services directly to children under the age of 6 and indirectly to parents. Parents could benefit from an education seminar on the importance of early screening for their children, while children can be screened in an environment in which they are comfortable. Furthermore, AHS programs are partnered with related community programs and are a good source of networking. Overall, the benefits of partnering with AHS programs are that they are economical, have a targeted population base, and are an informative group to partner with for a pilot project. Challenges to working with this group are that they do not target all on reserve populations and are often not in close proximity to remote reserves. In 2000-2001, it was reported that there were approximately 75 AHS programs on reserve, although this number has decreased in recent years. As a result of this limited coverage geographically, the more isolated communities will still not receive the vision services they require and will still struggle with issues of access.
- Partnerships at the local level with child care workers and targeting the underserved areas are also necessary to ensure the success of the pilot project. Meaningful local consultation and coordination will promote sustainability.

Education

- Education should be provided to community members on health issues that include the importance of vision, hearing, and dental screening at a young age. Services are often provided by the PHN when the child reaches kindergarten, but this is sometimes too late for the identification and treatment of amblyopia or strabismus. Some communities in British Columbia 'are not sure' if these services are needed or to what degree they are needed, while other communities reported that 'dental services are urgently needed' or that they 'desperately need vision services'. It would be recommended to train the in-community support staff in the long term benefits of having regular vision, hearing, and dental assessments for children.
- Education should also be provided to community members about accessing vision, hearing, and dental screening and the importance of follow-up appointments with a medical professional when required. Education is needed on how to access off reserve health services, which would include making an appointment, ensuring transportation is available, and providing funding for incidentals.
- Education should be an ongoing endeavour that will aid in sustainability of screening programs.
- Education should be provided to parents and caregivers that stress the importance of having their child's vision screened by the age of three, but to also be aware of any visual disturbances that are obvious to the naked eye and to seek medical attention as soon as possible if deemed necessary. A visual chart identifying common defects could be considered as an educational tool both for adults and youth.
- Education must also be reciprocal. Health care staff must be culturally sensitive and culturally aware when providing services to an Aboriginal community.

Initial Training Goals

- For the initial pilot project, support staff from the health authorities, such as PHNs, could be employed to complete vision screening for preschool children. This approach would be the most economical, would build upon networks that are already in place, and would be the most efficient use of time as training would be kept to a minimum.
- A second component to staffing of the pilot projects would be to have trainees from Aboriginal communities work with the support staff. Hands on experience would be the most practical way to incorporate the Aboriginal way of knowing with the western model of health care delivery. This would be a great learning experience for both the support staff and the trainee.
- People who are chosen to be screeners for each region would benefit from group training. This encourages group participation while offering the screeners a network of like-minded people when questions, concerns, or comments arise.

The networking process of initially training public health staff, incorporating that training into practical training with interested Aboriginal participants, and working together to deliver services would be a solid foundation for employing Aboriginal screeners full time for this initiative. This would be a positive step towards the communities having control over their own health care delivery, while incorporating a culturally appropriate and acceptable Aboriginal approach.

Long Term Training Goals

- Building capacity through sustainable employment and training as an ophthalmic assistant/vision screener within Aboriginal communities in British Columbia will ensure sustainability of the vision screening project.
- CHRs may be a good workforce to target for training. While many CHRs have incredibly large workloads, they are often willing to take on new challenges.
- A regional liaison is another consideration for training. Aboriginal vision screeners can be trained in each health authority with the expectation that they travel to communities to deliver vision screening services.
- It is recommended that vision screeners receive certification as an ophthalmic assistant. Accredited distance education courses are available in Canada. For example, Centennial College, Ontario offers an Ophthalmic Medical Personnel course which provides a solid background in the anatomy of the eye and eye conditions. As it is a distance education course, it would be a perfect fit for someone who learns better in a 'hands on' capacity. Once the individual completes this course, there are many other courses offered in the field of ophthalmology to advance their education. Course information is available at <http://db2.ceennialcollege.ca/ce/certdetail.php?CertificateCode=7934>.
- Along with registration in the Ophthalmic Medical Personnel course, an essential part of the training would include partnering with an ophthalmologist, optometrist and/or an orthoptist for further hands on training. This type of training develops people skills as well as the realities of working in a medical setting.

Sustainability

- The introduction of pilot projects to the Aboriginal population should ensure they are sustainable into the future. A method of service delivery should be developed that is culturally appropriate and well accepted, thus increasing the likelihood of success. The assurance of sustainability can be obtained by 'piggybacking' on programs that are already in place, are culturally acceptable, and have proven their reliability over time. For example, the Aboriginal Head Start program is well received throughout British Columbia and provides services to a large number of Aboriginal communities. Also, the Honour your Health program supports knowledge development which would be important for the promotion of the vision screening pilot project.
- It is recommended that the staff in Aboriginal Head Start and Honouring Your Health programs be provided education in the benefits of early childhood

screening for vision, hearing, and dental. Support from these organizations will assist in soliciting support from individual communities.

Scope and Scale of Knowledge Translation of Pilot Projects

- It is recommended that people involved in the preschool vision screening pilot project (e.g. Aboriginal Head Start, Honour Your Health, policy makers etc.) are aware of the deliverables outlined in BC Initiatives for Aboriginal Health guidelines. This pilot project is not about service provision or becoming a main funding source of vision screening pilot projects. but the focus is on knowledge translation, synthesis and exchange. That is, the project should focus on the cultural appropriateness of the service delivery, ensuring individuals are involved at the community level, and building on the resources in the communities to aid in delivery of health services.
- Consideration must be given to the scope and scale of this project in order to determine if the policies and procedures developed here can be transposed into other pilot projects planned for Aboriginal communities.
- There is a wide variation in population counts in each community, urban versus rural communities, and specific needs in delivery mechanisms both within and between regions. Universal policies and procedures would be very difficult to implement based on these demographics. Consideration of the Aboriginal world view can be disseminated throughout the province, however preschool vision screening initiatives will need to be tailored to the specific needs of each region.

Challenges of Initiative

- As with most pilot projects, this project anticipates the identification of gaps in service delivery. Consideration needs be given to what can be done about gaps in service delivery while the project is in operation.
- The identification of gaps can also work as an advantage to the pilot project. For example, gaps in the design process, screening tools, or quality control checks can effectively be incorporated into 'fine tuning' the pilot project.

Project Evaluation

- It is recommended that under the umbrella of the BC Initiatives for Aboriginal Health overall evaluation framework, an evaluation process specific to the preschool vision screening project be implemented.
- It is recommended that the evaluation would include a midterm progress/evaluation report and a final progress/evaluation report. The reports must illustrate/demonstrate the extent to which the goals and objectives of the pilot project are met.

Vision Screening in Practice

Project Validation

- The implementation of a policies and procedures guideline prior to the commencement of the screening pilot project will ensure reliability and validity in the results. Academic leaders from BC Initiatives for Aboriginal Health, public health staff, potential screeners, community leaders, and professionals in the field of ophthalmology or optometry have provided advice and assistance in this process over the past 18 months. The development of a training manual, which includes a history taking form, a doctor referral form, and a follow-up/call-back form for parents/guardians to ensure the child receives the vision care, will promote project success.

Screening Tools for Pilot Projects

- Screening tools deemed to be acceptable by the Provincial Screening Steering Committee for these pilot projects are the HOTV and Randot vision screening tools. The HOTV test measures visual acuity at 10 feet. It includes a chart and cards that are easy for children (usually 3 to 5 years of age) to use. This test is considered to be an accurate measurement of acuity and is easy to use, inexpensive (approximately \$14.25USD), and portable. Accessories required with these tools are a wall-mounted light box (approximately \$155USD) and an occluder (approximately \$7.50 pkg/24 USD) which are also economical. The Randot Stereoacuity tool measures stereopsis (the ability to perceive three dimensional images in both eyes) in patients as young as 2 years old by matching visuals from left to right. This screening tool must be used in conjunction with the HOTV test and can be purchased for approximately \$158USD.
- The HOTV and Randot Screening tools are cost effective, transportable, and accurate. It is recommended that after the close of the pilot projects, these tools can be left for future use in the centres where they were piloted.
- Another screening tool recommended by the Provincial Vision Screening Steering Committee is a Welch-Allyn hand held autorefractor which provides a subjective measurement of visual acuity. An autorefractor is recommended for children as young as 3 years of age. While recommended for use by the steering committee, it is not recommended for the BC Initiatives for Aboriginal Health preschool vision screening pilot projects due to cost and other inhibiting factors. Autorefractors cost approximately \$5,000 and need to be calibrated out of province, on a regular basis. Literature indicates this process takes only 30 seconds to complete, but the child must be completely still and uninhibited by this procedure for a measurement to be taken within this time frame. The screener must also receive additional training in the use of this equipment for this test to be accurate.

Target Age Group

- It is recommended that the target group for screening be children aged 3-6 years. The provincial government initially suggested vision screening for children 0-6, however, this age group is too broad for screening purposes. Young children (0-3) with obvious visual defects should be seen by an ophthalmologist or optometrist as soon as possible. Screening for strabismus and amblyopia can be administered by a trained visual screener at the age of 3. At this age, a child is able to respond to questions asked of the screener, and can participate in the process.

Summary

The purpose of this needs assessment was to determine the vision needs of Aboriginal children on and off reserve throughout British Columbia. A telephone survey was conducted whereby 206 community health representatives and/or public health nurses on reserve throughout British Columbia were contacted and asked questions regarding the availability of vision screening services on reserve, if there was access to vision screening services, and if other health services (i.e. hearing and dental screening) were required but not available. Of the 206 bands contacted, 145 bands chose to participate in this survey. As a result, the findings of this survey are the opinion of the majority.

Results of the survey showed that few of the bands had vision services available to them (see Table 3). It should be noted that those who reported easy access to services were also in close proximity to large service centres. Distance travelled to access services was dependent on factors such as geographic location and the presence of optometric satellite offices for vision testing. For example, in the northern part of BC, it was quite common to hear people discuss travel times of up to seven hours to access services, while communities in the southern part of BC would travel approximately 20 - 45 minutes to their nearest service centre. Satellite offices eased the burden of travel time, but people often commented on the lack of access due to short clinic times or clinics offered only during their work hours which made access to these services limited.

The majority of respondents stated that they felt vision screening services were needed in their community. Comments ranged from 'it would be nice to have those services' to 'vision services are desperately needed'. Only twelve bands stated that they did not need vision services for children either because of the small number of children on reserve or due to their close proximity to a city centre.

Sixty seven respondents reported that they had Aboriginal Head Start programs in their communities. While this represents less than half of respondents, many others noted they had access to Aboriginal Head Start programs that were near their community. It would therefore make sense to partner with this program as the majority of communities have access to their services, are aware of the programs that are offered, and are receptive to these programs.

Cost and access were two main themes that emerged from the telephone surveys. Travel distances, lack of funding, and lack of reliable transportation were identified as challenges to seeking vision and other health care services. Furthermore, people identified inappropriate clinic times, sporadic services and inadequate services to meet the needs of the community as challenges to accessing vision services. These issues must be addressed before any pilot project can hope to be successful in its service delivery.

Recommendations have been made regarding service delivery of vision screening programs that are culturally sensitive, accessible, available, and sustainable into the future. In summary, in order for preschool vision screening pilot projects to be successful and sustainable, there must be a clear understanding of the Aboriginal world view, education is needed both by the service provider and the service user, and the project must have an initial goal to be sustainable throughout the initial development stages of the project. Furthermore, knowledge translation, synthesis and exchange should be incorporated into the scope and scale of the pilot projects, and long term training goals should be carefully planned in the development stages of service delivery. Following these recommendations will substantially increase the likelihood of successful delivery of preschool vision screening for Aboriginal children.

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Appendix A – BCAO list of practicing optometrists and satellite offices

Location	Optometrists		Health Authority	Total
100 Mile House	Dr. Sophia Awadia Dr. Tracy Brown Dr. Kimberly Collins Dr. Daniel Derksen Dr. Morgan Hughes	Dr. Deborah Jennings Dr. Surjinder Sahota Dr. Neil VanderHorst	Interior Health Authority (IHA)	8
Abbotsford	Dr. Hardeep Bhangu Dr. Alan Boyco Dr. Sukhjit Bubra Dr. Blake Bullock Dr. Kamaldip Dhaliwal Dr. Jason Lau Dr. Rajinder Mann Dr. David Petrik	Dr. May Doldolea Dr. Randall Dyke Dr. Graham Foster Dr. Joanne Hankey Dr. James Hargrave Dr. Mary Lou Riederer Dr. Christine Wang Dr. Garth Webb	Fraser Health Authority	16
Armstrong	Dr. Lawrence MacAulay Dr. Kimberley Williams		IHA	2
Ashcroft	Dr. Ruth Saunders		IHA	1
Blairmore	Dr. Jeffrey Mann Dr. Donald Vinge			2
Burns Lake	Dr. Shawn Greydanus Dr. Trevor Kreke Dr. Zareen Charania Dr. Jeff Ferron Dr. Tanya Flood	Dr. Elaine Kerr Dr. Ghislaine Lauzon Dr. Lyle Myrfield	Northern Health Authority (NHA)	8
Castlegar	Dr. Brent Allen Dr. Tim Allen Dr. Eric Beauchamp Dr. Jonathan Proctor		IHA	4
Chase	Dr. Deane Gerry Dr. George Ujimoto		IHA	2
Chemainus	Dr. Carla Clarke Dr. Trevor Miranda Dr. Anita Voisin		Vancouver Island Health Authority (VIHA)	3

Chetwynd	Dr. Andrew Kadziolka Dr. Eric Smart		NHA	2
Chilliwack	Dr. Darcy Bauer Dr. Alan Boyco Dr. Kevin Cullen Dr. Lucky Gandham Dr. Sandra Schnarr Dr. Daryl Schnarr		Fraser Health Authority (FHA)	6
Clearwater	Dr. Ann Byard Dr. Rajesh Narang Dr. Nicolas von Dehn		IHA	3
Cobble Hill	Dr. Carla Clarke Dr. Trevor Miranda Dr. Anita Voisin		VIHA	3
Comox	Dr. David Dowe Dr. Raymond Limber		VIHA	2
Coquitlam	Dr. Nurudin Ahmed Dr. Alan Boyco Dr. Shane Burgess Dr. Kuen Cheung Dr. Jennie Chi Dr. Alice Chun Dr. Tarndip Gandham Dr. James Johnson Dr. Gurpreet Leekha Dr. Lloyd Mah	Dr. Karim Mithani Dr. Alan Nicholson Dr. Ruby Parmar Dr. Mark Samra Dr. Herman Shen Dr. Hardip Thind Dr. Christine Wang	FHA	17
Courtenay	Dr. Mary Lynn Des Roches Dr. Jeff Ferron Dr. Tanya Flood Dr. Elaine Kerr Dr. Lyle Myrfield		VIHA	5
Cranbrook	Dr. Richard Bednarczyk Dr. Donald Demarchi Dr. Whitney Henker Dr. Donald Henker Dr. Fredric Robertson		IHA	5

Creston	Dr. Larry Fluss Dr. Gene Zackowski		IHA	2
Dawson Creek	Dr. John Gentles Dr. Andrew Kadziolka Dr. Todd Lang Dr. Eric Smart Dr. Grant Timmins		NHA	5
Delta	Dr. Sultanali Baloo Dr. John Black Dr. Alan Boyco Dr. Giulia DeVuono Dr. Graham Foster Dr. Jaspaul Manhas Dr. Diane Spada Dr. Nixon White	Dr. Nina Gill Dr. Angela Hern Dr. William Jackson Dr. Komal Madan Dr. Luna Mangat	FHA	13
Duncan	Dr. Richard Anderson Dr. Linda Kirsch Dr. Karen McClinchey Dr. Craig Reavley		VIHA	4
Elkford	Dr. Jeffrey Mann Dr. Donald Vinge			2
Enderby	Dr. Karla Reimer		IHA	1
Fernie	Dr. Jeffrey Mann Dr. Donald Vinge		IHA	2
Fort Nelson	Dr. John Gentles Dr. Todd Lang Dr. Grant Timmins		NHA	3
Fort St. James	Dr. Shawn Greydanus		NHA	1
Fort St. John	Dr. John Gentles Dr. Todd Lang Dr. Bryan Rogers Dr. Grant Timmins		NHA	4
Gibsons	Dr. David English Dr. Robin Simpson Dr. Grant Wood		Vancouver Coastal Health Authority (VCH)	3
Golden	Dr. Daniel Hurd Dr. Timothy Styles		IHA	2

Grand Forks	Dr. Alan LeRoy		IHA	1
Hope	Dr. Kevin Cullen Dr. Daryl Schnarr		FHA	2
Invermere	Dr. Mark Moneo		IHA	1
Kamloops	Dr. Ann Byard Dr. Giovanni Cinel Dr. Leonard Demarchi Dr. Eugene Ebata Dr. Deane Gerry Dr. Ruth Saunders Dr. Robbin Shamenski Dr. Edward M. Takahashi	Dr. David Hampton Dr. Don Mathieson Dr. Rajesh Narang Dr. Michael Noble Dr. Mario Pozza Dr. Barry Weaver Dr. Joshua Weston Dr. Edward T. Takahashi Dr. Nicolas von Dehn		
Kaslo	Dr. Roland Daniels		IHA	1
Kelowna	Dr. Stacey Lynn Grimes Dr. Jelke Hoekstra Dr. John Kemp Dr. Calvin Kettner Dr. Gurpreet Leekha	Dr. Manley March Dr. Louise Myshak Dr. Jeffrey Nielson Dr. Scott Percival Dr. Marc Stickle Dr. Greg Wallace Dr. Brent Westfall	IHA	12
Kimberley	Dr. Christine Chatten		IHA	1
Kitimat	Dr. Stephanie Mortimer Dr. Harry Murphy		NHA	2
Ladner	Dr. Susan Lu		FHA	1
Ladysmith	Dr. Valerie Gunn Dr. Michael Kellam Dr. Johnathan Lam Dr. David Myrfield		VIHA	4
Lake Country	Dr. Karla Reimer			1
Langford	Dr. Laurie Brennan Dr. Brian Joslin Dr. Gordon Lam Dr. Louise Morin Dr. Stephane Rodrigue			5
Langley	Dr. Gurjeet Bains Dr. Alan Boyco Dr. Daniel Davies Dr. Susan Han Dr. Craig Harding	Dr. Jonathan Laudadio Dr. Angela Lee Dr. Alireza Mahdavian	FHA	15

	Dr. John Jantzi Dr. Shafiq Jiwani Dr. James Johnson Dr. Anita Kanwal Dr. Ranjit Kharod	Dr. Murtaza Merali Dr. Karen Mudry		
Maple Ridge	Dr. Harpinder Gill Dr. Melanie Hoo-Fatt Dr. Murray Hurlbert Dr. David Lennox Dr. Alice Lennox	Dr. Sherman Olson Dr. Judy Schnarr Dr. Jill Trotter	FHA	8
Mackenzie	Dr. Robert Reid		NHA	1
Merritt	Dr. Carrie-Lynn Snee		IHA	1
Mill Bay	Dr. Craig Reavley		VIHA	1
Mission	Dr. Neil Bowden Dr. Oliver Chong Dr. Darren Sass Dr. Wen-Hua Wang		FHA	4
Nakusp	Dr. Roland Daniels		IHA	1
Nanaimo	Dr. Alan Ball Dr. Allison Chang Dr. Stanley Eng Dr. Paul Geneau Dr. Valerie Gunn Dr. Ruby Tse	Dr. James Holmes Dr. Michael Kellam Dr. Jonathan Lam Dr. David Myrfield Dr. David Thompson	VIHA	11
Nelson	Dr. Tim Allen Dr. Eric Beauchamp Dr. Roland Daniels Dr. Jonathan Proctor		IHA	4
New Westminister	Dr. Sureen Bachra Dr. Shannon Cerniuk Dr. Cindy Ho Dr. Brenda Horner Dr. Ruth Lin Dr. Shainul Waljee	Dr. Jerianne Montgomery Dr. Gordon Moore Dr. Ashifa Nurani Dr. Elana Schiller Dr. Romanie Stuart	FHA	11
North Vancouver	Dr. Noozhan Ashraf Dr. Pavan Avinashi Dr. Antoinette Dumalo Dr. Mahmood Gilani Dr. Akbar Hakimzadeh Dr. Katherine	Dr. Valeria Kao Dr. Nermin Karim Dr. Susan Lee Dr. Alireza Mahdavian Dr. Amit Mathur Dr. Heing Taing Dr. James Thompson	VCH	18

	McKay Dr. Patrick McRoberts Dr. Sanaz Molavi Dr. Karen Mudry Dr. Altaz Shajani	Dr. Christine Wang		
Oliver	Dr. Michale Chivers		IHA	1
Osoyoos	Dr. Michale Chivers Dr. Tammy Crawford Dr. Dale Liddicoat Dr. Stewart McLeod Dr. Navdeep Singh Dr. John Twidale		IHA	6
Parksville	Dr. Alan Ball Dr. Michael Patz		VIHA	2
Pender Island	Dr. David Schaafsma		VIHA	1
Penticton	Dr. Michale Chivers Dr. Tammy Crawford Dr. Mellisa Hudell Dr. Dale Liddicoat Dr. Stewart McLeod	Dr. Navdeep Singh Dr. John Twidale Dr. Robert Zak	IHA	8
Pitt Meadows	Dr. Robert Strath		FHA	1
Port Alberni	Dr. Shaun Golemba Dr. Gerald Trees		VIHA	2
Port Coquitlam	Dr. Larry Chow Dr. Murdoch Coe Dr. Morgan Hughes Dr. Deborah Jennings Dr. Michael Tansley Dr. Rosa Zazzi		FHA	6
Port Hardy	Dr. Stanley Eng		VIHA	1
Port Moody	Dr. Sarah Yee		FHA	1
Powell River	Dr. Thomas Adamack Dr. Karen Eddy Dr. Leslie York		VCH	3
Prince George	Dr. John Bosdet Dr. Michael Dennis Dr. Dale Dergousoff Dr. Shawn Greydanus Dr. Lisa Logan	Dr. Brenton Loose Dr. Julie Louie Dr. Clara Malinsky Dr. Ross Nickolet Dr. Brooke Parker Dr. Robert Reid	NHA	11

Prince Rupert	Dr. Michael Barlow		NHA	1
Princeton	Dr. Carrie-Lynn Snee		IHA	1
Qualicum	Dr. Alan Ball Dr. Allison Chang Dr. Valerie Gunn Dr. Michael Kellam Dr. Johnathan Lam	Dr. David Myrfield Dr. Gerald Trees	VIHA	7
Quesnel	Dr. Debra Kos Dr. Ross Nickolet		NHA	2
Revelstoke	Dr. Terrance O'Hagan		IHA	1
Richmond	Dr. Denny Birring Dr. Lawrence Chan Dr. Francis Cheng Dr. Kuen Cheung Dr. Henry Chong Dr. Larry Chow Dr. Jenna Fukushima Dr. Lucky Gandham Dr. Grace Tsang Dr. Conrad Vetsch Dr. Rosita Wang Dr. Chiann Yang Dr. Jennifer Yu Dr. Karen Yu	Dr. Lloyd Ho Dr. Robert Kemp Dr. Denis Kim Dr. Thomas Lau Dr. Annie Liang Dr. Elisa Lim Dr. Kevin Loopeker Dr. Jason Louie Dr. Tod McNab Dr. Donna Mockler Dr. Grace Ng Dr. Monica Pang Dr. Hanif Abdul Paroo Dr. Herman Shen Dr. Gloria Surh	FHA	29
Saanichton	Dr. Paul Neumann		VIHA	1
Salmon Arm	Dr. Robert Allaway Dr. James Beckner Dr. Lisa Scharf Dr. George Ujimoto		IHA	4
Salt Spring Island	Dr. Andrea Varju		VIHA	1
Sardis	Dr. Darcy Bauer Dr. Kevin Cullen Dr. Daryl Schnarr		IHA	3
Sechelt	Dr. David English Dr. Patrick McRoberts Dr. Grant Wood		VIHA	3
Sicamous	Dr. Shelley Geier		IHA	1
Sidney	Dr. Arthur Bevan Dr. Lorie Bradley Dr. Aisha Cheng		VIHA	5

	Dr. Netty Sutjahjo Dr. Jack Williams			
Smithers	Dr. Rix Graham Dr. Trevor Kreke Dr. Barry Lester Dr. Robert Onstein		NHA	4
Sooke	Dr. Laurie Brennan Dr. Brian Joslin Dr. Louise Morin		VIHA	3
Squamish	Dr. Corinne Knight Dr. Barton McRoberts Dr. Tyler Strong		VCH	3
Summerland	Dr. Grant Goods		IHA	1
Surrey	Dr. Judith Balberan Dr. Gaggandeep Basra Dr. Hardeep Bhangu Dr. Alan Boyco Dr. Maye Doldolea Dr. Glen Dyck Dr. Michelle Elliott Dr. Nancy Selinger Dr. John Stuart Jr. Dr. Rosita Wang Dr. Wen-Hua Wang Dr. Rick Wong Dr. Daphne Wong- Kamachi	Dr. Susan Han Dr. Riley Hanberg Dr. Sandy Johal Dr. Lindsay Kamachi Dr. Ranjit Kharod Dr. Nelly Kim Dr. Sukhzadvinder Lail Dr. Amrik Panesar Dr. Eric Pharand Dr. Susy Pierazzo Dr. Holger Pierce Dr. Ryan Quinn Dr. Mark Samra Dr. Mona Sandhu	FHA	27
Terrace	Dr. Rebecca Counts Dr. Stephanie Mortimer Dr. Harry Murphy		NHA	3
Trail	Dr. Brent Allen Dr. David Kendrick Dr. Alfred Semenoff Dr. Joan Twidale		IHA	4
Tsawwassen	Dr. Daniel Davies Dr. Joan Hansen Dr. Shafiq Jiwani Dr. Lucie Martineau		VCH	4
Ucluelet	Dr. Shaun Golemba		VIHA	1
Vancouver	Dr. Mark Aginsky Dr. Nurudin Ahmed	Dr. Alisa Gafur Dr. Gerard Gauthier	VCH	77

	Dr. Hugh Archer Dr. Richard Bissonnette Dr. Catherine Boychuk Dr. Alan Boyco Dr. Stephanie Brooks Dr. Shane Burgess Dr. Shannon Cerniuk Dr. Ravdeep Chatha Dr. Jennie Chi Dr. Della Chow Dr. Raymond Chow Dr. May Chung Dr. Jody Clark Dr. Darsh Dosanjh Dr. Sam Epstein Dr. Graham Foster Dr. Roger Gafur Dr. Geoffrey Marsh Dr. Lucie Martineau Dr. Brad McDougall Dr. Tod McNab Dr. Barton McRoberts Dr. Michael Melenchuk Dr. David Mitchell Dr. Donna Mockler Dr. Sanaz Molavi Dr. Kevin Mowbray Dr. Peter Mulhall Dr. Grace Ng Dr. Jessica Ng Dr. Buffy Oikawa Dr. Ruby Parmar Dr. Amrit Pawa Dr. Katherine Pratt Dr. Manbir Randhawa Dr. Thomas Rea	Dr. Harpinder Gill Dr. Cindy Ho Dr. Melanie Ho Dr. Corinne Knight Dr. Gerald Komarnicky Dr. Caroline Kriekenbeek Dr. Elizabeth Lai Dr. Maxine Law Dr. Trinh Le Dr. Anthony Lee Dr. Ruth Lin Dr. Patrick Lo Dr. Kevin Loopeker Dr. Vicki Lum Dr. Jeffrey Ma Dr. Jerry MacKenzie Dr. Jennifer Mak Dr. Dawn Reinders Dr. Peter Renke Dr. Marina Roma-March Dr. Patricia Rupnow Dr. Parminder Sandhu Dr. Meg Sexsmith Dr. Tanya Short Dr. Robin Simpson Dr. Newman Song Dr. Marnie Tucker Spino Dr. Gloria Surh Dr. Conrad Vetsch Dr. Cindy Wagner Dr. Anthony Wong Dr. Gordon Wong Dr. Jason Wong Dr. Patrick Woo Dr. Janey Yee Dr. Vivian Yeung Dr. Sepideh Ziabakhsh		
Vanderhoof	Dr. Shawn Greydanus		NHA	1

Vernon	Dr. Meghan Ashton Dr. Paul Clark Dr. John Dvorack Dr. Jelke Hoekstra Dr. Douglas Irwin	Dr. Randal Mark Dr. Thomas Reed Dr. Tuck Warner Dr. Kimberley Williams	IHA	9
Victoria	Dr. Marvin Argatoff Dr. Erik Bentzon Dr. Laurie Brennan Dr. Victor Chin Dr. Kirsten Dukelow Dr. Arnold Eitutis Dr. Heidi Fandrich Dr. Lise Fraser Dr. Bryan Friedmann Dr. Colleen Gill Dr. Robert Grundison Dr. Brian Joslin Dr. Mary Jean Krawciw Dr. Anais Lam Dr. Gordon Lam Dr. Jason Lau Dr. Judith Le Roy Dr. Diane Madson Dr. Helen Martindale Dr. Matthew Maruno Dr. Amit Mathur Dr. Jason Maycock Dr. Mark Moneo Dr. Louise Morin	Dr. Brent Morrison Dr. Paul Neumann Dr. Irena Odelet Dr. Neil Paterson Dr. John Poon Dr. Craig Reavley Dr. Stephane Rodrigue Dr. Rachel Rushforth Dr. Parminder Sandhu Dr. David Schaafsma Dr. Neal Singh Dr. Chris Snow Dr. Erick Vesterback Dr. Amanda Weinerman Dr. Scott Williams Dr. Cynthia Willis Dr. Kevin Youck Dr. Ann-Marie Stewart Dr. Guy Stewart Dr. Netty Sutjahjo Dr. Suzanne Sutter Dr. Daisy Tao Dr. Steve Taylor	VIHA	47
West Vancouver	Dr. Pavan Avinashi Dr. Sophia Awadia Dr. Alan Boyco Dr. Tajinder Khanghura Dr. Corinne Knight Dr. Debra Rovinelli Dr. Elana Schiller	Dr. Saida Lalani Dr. Bess Lu Dr. Peter Mulhall Dr. Katherine Nounopoulos Dr. Buffy Oikawa	VCH	15

	Dr. Tyler Strong Dr. Wen-Hua Wang Dr. Andreas Weimar			
Westbank	Dr. Noel Erhardt Dr. Scott Percival		IHA	2
Whistler	Dr. Shea Scott Dr. Karen Smith Dr. Cindy Wagner		VCH	3
White Rock	Dr. Cindy Anderson Dr. Hardeep Bhangu Dr. Tracey Curry Dr. Sally Donaldson Dr. Tracy Ertel Dr. Melanie Sherk		FHA	6
Williams Lake	Dr. Tracy Brown Dr. Kimberly Collins Dr. Daniel Derksen Dr. Jason Meyers Dr. Surjinder Sahota		NHA	5

Appendix B

Telephone Interview Guide for Preschool Vision Screening Initiative

Interviewer: _____ Date:

Section A – Background Information

A1. Name: _____

A2. Community: _____

A3. How many years have you lived in the community? _____

A4. How many children under the age of 6 live in your community? _____

Section B – Vision Screening Services

B1: Are vision services for preschool children available in your community?

If no, continue to question B2

If yes:

B1A: When was the last time screening was done?

B1B: What age group was screened?

B1C: Who conducted the screening?

B1D: Did screening involve vision only or other health services as well?

B2: Are you aware of the preschool vision screening pilot project that is being initiated by the provincial government?

If no, provide overview of project and continue with question B3

If yes, continue to question B3

B3: Do you believe there is an interest in your community to participate in this project?

B4: Do you believe there would be support to train community members in vision screening?

Prompts: Human Resources

Community promotion of project

B5: Do you think this vision screening service is needed in your community?

B6: What type of community resources would help to promote awareness of the importance of vision screening?

Prompts: Pamphlets/brochures

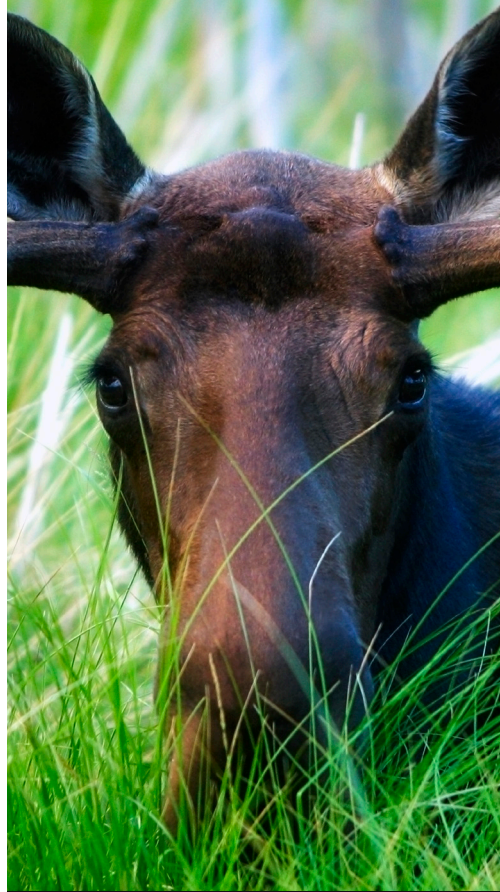
Community meetings

Speaking with students/teachers/teachers aides at school

B7: Are there other health services for children that are required in your community but not currently available?

Section C – Concluding Questions

C1: Is there anything you would like to add that we haven't already talked about?



Aboriginal PRESCHOOL VISION SCREENING

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