

Exploring the implementation and potential adaptation of Action Schools! BC for Rural and Remote First Nations Communities

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EXECUTIVE SUMMARY

The health of Aboriginal people in Canada is globally poorer than that of other Canadians; even more concerning is the health of Aboriginal children and youth. Overweight and obesity have become major health challenges for all Canadian children, with an overall prevalence reported to be approximately 26%; however, for Aboriginal children, these numbers are even more concerning, with prevalence rates reported to be as high as 50-65% in some Canadian communities. In parallel to this increased rate of obesity, there has been a concomitant rise in the incidence of type 2 diabetes worldwide. Of particular concern is the appearance and increasing prevalence of type 2 diabetes and pre-diabetes among Aboriginal youth. Effective treatment and prevention strategies are essential to prevent the long-term complications associated with type 2 diabetes.

The investigators have a long-standing relationship with the Tsimshian Nation, which includes the communities of Hartley Bay (Gitga'at), Kitkatla (Gitkxaahla) and Port Simpson (Lax Kw'alaams). This relationship was established through a community-driven cooperative program, "Brighter Smiles", initially developed for the reduction of dental caries and well-child surveillance. Hartley Bay, Kitkatla and Port Simpson are remote First Nations fishing communities on the Pacific coast of British Columbia, Canada. Following identification by the "Brighter Smiles" team of a child with asymptomatic type 2 diabetes, the three communities requested diabetes screening for all of their children. This screening revealed a high prevalence of obesity and overweight as well as glucose intolerance (pre-diabetes). Following presentation of these results, the communities requested to work collaboratively with the investigators to develop culturally- and environmentally-appropriate school-based strategies for treatment and prevention.

Some investigators have reported encouraging results from school-based lifestyle change interventions. School-based programs that have included education on healthy eating (HE) and physical activity (PA) have shown decreased insulin resistance and improved glucose tolerance and increased self-efficacy. However, to date, results have not been sustained over time. If results are to be sustained over time, interventions will require effort at multiple levels –

community, groups, school, families and individuals. The Action Schools! BC (AS! BC) model (<http://www.actionschoolsbc.ca/Content/Quick%20Links/ASBC%20Support%20and%20Resources.asp>) was designed to serve as a primary prevention tool for known chronic diseases through a sustainable PA and HE program that goes beyond the traditional confines of the classroom using a ‘whole school model’. This program also actively promotes the translation of research knowledge by engaging key stakeholders in the school and the larger community. The AS! BC program addresses this need for effort at multiple levels, but does not currently address the Aboriginal need to incorporate, clearly and specifically, the desired traditional activities and diet.

The purpose of the project and research was a) to determine if the existing AS! BC model was feasible and appropriate for schools and children in rural and remote Aboriginal communities, and 2) to explore implementation in that context (facilitators, barriers and adaptations). The long term goal is to improve the health and health literacy of Aboriginal Canadians living in Aboriginal communities through a school-based program designed to increase physical activity and physical fitness, and improve nutrition.

Research Design

This study was approved by both the Children’s and Women’s Hospital Research Review Committee, the University of British Columbia Clinical Research Ethics Board, and the University of Victoria Research Ethics Board and informed consent and assent were obtained from all subjects. This was a community-based participatory action research project that was approved by the elected Band Council, the hereditary band chiefs and elders, the community health directors and health representatives of each village.

To explore early perceptions of feasibility and potential barriers and facilitators to implementation, we conducted semi-structured focus groups with participating teachers and administrators at the sites following their introduction to the model and prior to implementation (Spring 2007). To explore the needs of the students in these rural and remote communities and the match between their needs and the Action Schools! BC model, we also conducted semi-structured focus groups with students.

At baseline, all schools completed a school Action Plan in which they set goals in each Action Zone, described activities and established timelines for those activities. The 6 Action Zones included: 1) School Environment, 2) Scheduled PE, 3) Classroom Action, 4) Family and Community, 5) Extra-curricular and 6) School Spirit. Schools had three visits from the AS! BC support team. Teachers received two half-day training sessions: an overview of AS! BC and Classroom Action – PA (half-day Spring 2007) and Classroom Action – HE (Fall 2007). The support team also provided a further in-class refresher mid-year (both PA & HE), student leadership training for indoor and outdoor games, sport fit training (Winter 2008), and telephone check-ins and consultation (on request). Each teacher received a Planning Guide, a copy of the Action Pages and a Classroom Action Bin (www.actionschoolsbc.ca). The Classroom Action Bin was dedicated to each teacher’s classroom and contained equipment and resources to facilitate Classroom Action (PA & HE) activities (for example enough skipping ropes, dyna-bands, and grippers for the class as well as items such as colanders, chopping boards, DVD’s, posters and how-to manuals). The PA resources prioritized gender and skill level inclusive activities.

Although the model emphasized choice using a whole-school framework, Classroom Action was a ‘flagship’ component. Teachers were asked to provide students with a minimum of 15 additional minutes of PA each school day and at least one healthy eating activity per month in the Classroom Action Zone. Teachers provided “physical activity breaks” through-out the school day using a variety of activities and equipment outlined in the Action Pages and/or with equipment provided in the Action Bin. These activities included Hip Hop dancing, skipping, Bounce at the Bell, chair aerobics, yoga and strength work with exercise bands. Most activities required minimal equipment and could be performed in the classroom, hallway or on the school playground (where there was one). DVD-based resources that could be used to lead student sessions were also key resources (http://www.kidsfitnessvideos.com/product_info.php?products_id=20).

To address feasibility of the model, explore implementation and identify facilitators and barriers to implementation, we subsequently conducted semi-structured focus groups with participating teachers and administrators at each of the 3 schools after intervention (Spring 2008). Interview

schedules addressed satisfaction, benefits of the model, cultural relevance, challenges and supports for implementation and future implementation commitment.

Summary of Findings

The focus groups with the teachers were held after their introductory workshop, and the comments were universally positive. Teachers felt that that the program was important, and liked the variety and simplicity of resources. Some of the issues that they felt would limit implementation were difficulties doing the activities with the older children, getting the parents on board, and remembering. Key ideas for enhancing the cultural appropriateness were integrating the activities with local language, incorporating traditional foods and activities, and possibly making the classroom posters using native language.

The focus groups with the children highlighted their interest in and knowledge about the benefits of physical activity and that their parents encouraged them. They felt that options were limited by the size of their community, the availability of facilities, weather, wild animals, computers and video games, and teasing/gossiping. They wanted more equipment, more school teams, more group activities, dance classes and more facilities. They reported having only 'junk food' stores and having physical education 2-3 times per week.

In regards to feasibility, after one year of implementation, participants felt positive about AS! BC. When asked why AS! BC went well, three key themes emerged: 1) Easy to implement 2) Motivating and 3) Well-supported program.

Despite the very positive response to AS! BC, barriers remained. Lack of time, lack of financial resources, high staff turn-over (a barrier to future sustainability), evaluation requirements, student behaviour, low levels of personal knowledge about healthy living among staff, and lack of variety were key themes highlighted by the participants as barriers to implementation. In particular, the appropriateness of the resources for older children and the need for enhancing the variety for these children were highlighted. It should be noted that AS! BC was designed specifically for the elementary and middle school grade levels.

Participants suggested a number of adaptations that would enhance implementation and the relevance of the model and resources for Aboriginal communities. Participants suggested that enhanced community partnerships, parent education and a greater focus on the First Nations traditions would all improve the program. Participants stated that AS! BC was sustainable if the level of support could be sustained. They also identified that if the model was part of the provincial curriculum, they would have the additional support needed for implementation over the long term. Since the completion of the rural and remote pilot, the BC government has implemented a daily physical activity policy (DPA) for grades K-12, and Action Schools! BC is a key resource for schools to use in order to meet the guidelines.

Conclusions

Adaptation of existing school models, if they are flexible, and allow for community involvement and control, is a cost-effective alternative to promote health for Aboriginal communities. Action Schools! BC, as such a model, is appropriate for broader dissemination to Aboriginal communities. We need to facilitate affordable localized cultural adaptations and support for rural and remote locations because of their specific challenges. Collaboration with Aboriginal health organizations provincially and locally and the provision of training for local community stakeholders appears to be a viable way forward.

Exploring the implementation and potential adaptation of Action Schools! BC for Rural and Remote First Nations Communities

According to a number of health indicators, the overall health of Aboriginal Canadians is poorer than the health of the general Canadian population and has been for many decades (Federal, Provincial, Territorial Advisory Committee on Population Health, 1999). For instance, Katzmarzyk's analysis of the Canadian Community Health Survey data (Cycle 2.2, 2008) revealed that the overall prevalence of obesity (according to body mass index [BMI] measurements and not including those categorized as overweight) among Aboriginal adults was 37.8%, compared to 22.6% in the rest of the population and that this increased risk for obesity was present regardless of several demographic and lifestyle variables (Katzmarzyk, 2008).

Aboriginal Canadians also have a shorter life expectancy than the rest of Canadians, and report a disproportionately high prevalence of chronic disease and mental health conditions (MacMillan, MacMillan, Offord, & Dingle, 1996). With the substantial shift away from traditional lifestyles over the past half-century, Canadian Aboriginal communities have been increasingly burdened with chronic diseases associated with diet and physical activity, including a higher prevalence of risk factors associated with cardiovascular disease, metabolic syndrome (Liu et al., 2006), and type 2 diabetes (Young & Katzmarzyk, 2007). With type 2 diabetes in particular, the age-adjusted prevalence rates are estimated to range from 8-13%, equaling a rate that is three to five times higher than those in the general Canadian population (Young, Reading, Elias, & O'Neil, 2000).

Even more concerning is the fact that the health concerns of Aboriginal adults also apply to children. The prevalence of obesity in Aboriginal children and youth in 2004 was much greater (15.8%) than in the rest of Canadian children and youth (8.0%), and the prevalence of overweight and obesity was 34.5% compared with 26.1% (Katzmarzyk, 2008). More recently, in some specific First Nations communities, prevalence levels of 45% and 60% have been found (Wahi, Zorzi, Macnab, & Panagiotopoulos, 2009; Young, Dean, Flett, & Wood-Steiman, 2000). Furthermore, not only is the rate increasing, but there is a change in susceptibility, with cases reported in increasingly younger people (Health Canada Aboriginal Diabetes Initiative, 2001). The previous classification of type 2 diabetes as “adult-onset” has become a misnomer, with Manitoba reporting cases in children as young as 8 years of age (Young et al., 2000). Diabetes prevalence is greater among girls, who may go on to be mothers with type 2 diabetes or gestational diabetes, increasing the predisposition for their offspring to develop type 2 diabetes (Wahi et al., 2009). These trends are likely to continue unless long-term sustainable strategies are developed to change the current situation.

Similar to Aboriginal Canadians, people living in rural and remote communities also have elevated risk for many health issues (Kirby & LeBreton, 2002). The Kirby report suggested that the overall health of people living in rural areas was worse than their urban counterparts. Residents in rural areas had a shorter life expectancy and higher rate of infant death rates (Kirby & LeBreton, 2002). These health disparities were said to exist because of: decreased access to health care, an inability to recruit and retain health care personnel in remote locations and differences in health and health care needs in these locations due to the environment, demographics, occupations, and ethnic composition (Kirby & LeBreton, 2002; Nagarajan, 2004).

Unfortunately, the health disparities of rural and remote communities may exacerbate the health issues of Aboriginal Canadians, since more than half of Canadian Aboriginal peoples reside in rural and remote areas (Kirby & LeBreton, 2002).

It is apparent that appropriate health promotion strategies are needed to address the concerns of Aboriginal Canadians. School-based interventions have been promoted as one solution for the following reasons: 1) schools provide both the formal structures and processes for learning (Mullen et al., 1995), 2) health behaviours established early in life tend to track into adolescence and from adolescence into adulthood (Fuentes, Notkola, Shemeikka, Tuomilehto, & Nissinen, 2003; Janz, Dawson, & Mahoney, 2000; Malina, 1996; Mossberg, 1989; Trudeau, Laurencelle, & Shephard, 2004), and 3) children tend to spend a significant portion of their waking hours in school irrespective of their socio-economic circumstances (Fox, Cooper, & McKenna, 2004; P. J. Naylor & McKay, 2009). School-based interventions have been successful in Aboriginal communities (Himes et al., 2003; Paradis et al., 2005; Ritenbaugh et al., 2003; Saksvig et al., 2005; Story et al., 2003). The results are similar to the findings from school-based trials in non-Aboriginal communities where short-term changes in attitudes, behaviors and/or environments related to either physical activity (PA) or healthy eating (HE) have been demonstrated (P. J. Naylor & McKay, 2009; Sharma, 2007; van Sluijs, McMinn, & Griffin, 2008) with equivocal results of their impact on obesity (Brown & Summerbell, 2009). The sustainability of any of the short-term outcomes is yet to be established in Aboriginal communities (Ho, Gittelsohn, Harris, & Ford, 2006; Paradis et al., 2005). The school interventions that have been implemented in Aboriginal communities have been multi-component and included a healthy living curriculum in the classroom supported by activities in

other areas of the school. Notably, in Canada, these interventions (Sandy Lake Diabetes Prevention Project and Kahnawake Schools Diabetes Prevention Project) were embedded within, and supported by, broader community engagement and health promotion activities. Key intervention principles when working within Aboriginal communities that were identified in the Kahnawake and Sandy Lake projects include: involving community, providing learning opportunities, balancing community preferences with proven strategies, intervening in multiple settings, and allowing for tailoring to the local context (Ho et al., 2006; Potvin, Cargo, McComber, Delormier, & Macaulay, 2003).

To improve health and prevent chronic diseases such as type 2 diabetes, interventions must be implemented widely and sustained over time (Altman, 2009). Encouraging implementation of effective models has been a key challenge for public health and education stakeholders and researchers (Dzewaltowski, Estabrooks, Klesges, Bull, & Glasgow, 2004; Franks et al., 2007; Glasgow, 2008; Roberts-Gray, Gingiss, & Boerm, 2007). Ho et al emphasized the importance of learning how to ‘scale up’ effective interventions while allowing for community engagement and adaptation of the intervention to the individual context of each of many communities (Ho et al., 2006). Feasibility (including cost) is a primary consideration for scaling up. Adopting and adapting existing models that honour the principles for involving community and tailoring while providing a cost-effective alternative may be the best way forward. This may be particularly true in rural and remote communities where the cost of transportation (in both time and dollars) is already a primary barrier (Wharf-Higgins, Naylor, & Day, 2008).

Action Schools! BC (AS! BC)

AS! BC is a flexible, comprehensive, school health-oriented ‘model’ that provides tools for schools and teachers to create individualized Action Plans that take into account their local context and increase opportunities for physical activity (PA) and healthy eating (HE) across six Action Zones (P. J. Naylor, Macdonald, Zebedee, Reed, & McKay, 2006). These include: 1) School Environment, 2) Scheduled physical education (PE), 3) Classroom Action, 4) Family and Community, 5) Extra-curricular and 6) School Spirit. The AS! BC model provides teachers (primarily generalists) with enhanced training and classroom resources to implement their Action Plans (See Appendix A; descriptions also available at <http://www.actionschoolsbc.ca/Content/Quick%20Links/ASBC%20Support%20and%20Resources.asp>). Efficacy trials showed that AS! BC significantly increased school delivery of physical activity and healthy eating activities (Day, Strange, McKay, & Naylor, 2008; P. J. Naylor et al., 2006), children’s physical activity (P. J. Naylor et al., 2006), cardiovascular (Reed, Warburton, Macdonald, Naylor, & McKay, 2008) and bone health (Macdonald, Kontulainen, Khan, & McKay, 2007; Macdonald et al., 2008), and knowledge and consumption of fruit and vegetables (Day et al., 2008) when compared to schools and children that were usual practice. Based on these outcomes, the Government of British Columbia announced funding for the ‘scaling up’ of Action Schools! BC provincially, providing support in the form of resources for planning and implementation, training and ongoing provincial and regional facilitation (P. Naylor, Macdonald, Reed, & McKay, 2006).

A long-standing relationship between three communities of the Tsimshian Nation (located on the north coast of British Columbia) and researchers at the University of British Columbia on the Brighter Smiles project and an urgent need for diabetes prevention was the

foundation for further study into the feasibility of adopting Action Schools! BC as it was ‘scaled up’ in the Province of British Columbia.

Background to the Collaborative Partnership

Brighter Smiles, a successful community-driven and collaborative effort, originated to improve oral health within one rural and remote coastal Aboriginal community (Tsimshian) (Macnab, Rozmus, Benton, & Gagnon, 2008). As awareness of other health issues emerged in that community, ongoing support from the research team was requested, leading to a sustained collaboration. Two other Tsimshian communities subsequently became involved. This partnership has addressed health issues such as immunization rates, nutrition and most recently type 2 diabetes. The research team contributed suggestions for methodology, data collection and analysis while the community implemented the interventions and took ownership of the results.

Priority shifted to type 2 diabetes after an unsuspected case was identified in a child from one of the three communities (Wahi et al., 2009). Diabetes screening was requested for all children and subsequent to that, suggestions for community- and school-based activities to prevent the disease and promote health were developed. Two other communities also requested diabetes screening, and researchers leveraged funding for this, and the school-based activities were then offered to all three of the communities. Open public meetings were held in each community and included elders, band council members, parents, and some children. In each community, the people identified obesity and diabetes as major concerns and expressed great interest in participating in an initiative. They also wanted to explore incorporating elements of traditional diet and lifestyle practices into the initiative. Although adult Aboriginal health issues

were also important, the communities wanted to begin by targeting their children.

Concurrently, the AS! BC support team was actively consulting with Aboriginal stakeholders around the province of British Columbia about their needs and the suitability of the model for use in their communities. A partnership with the Brighter Smiles team was forged to determine the suitability of the model. The purpose of the project and research was a) to determine if the existing model was feasible and appropriate for schools and children in rural and remote Aboriginal communities, and 2) to explore implementation in that context (facilitators, barriers and adaptations).

Methods

Setting

The Tsimshian are a First Nations people whose territory is near Prince Rupert on the north coast of British Columbia and the southernmost corner of Alaska. Currently, there are about 10,000 Tsimshians; 8,700 living in Canada. The Tsimshian Nation consists of fourteen bands of which three have participated in this study. The economic base in the communities is primarily fishing, and logging.

Hartley Bay (Gitga'at) is a village located on the Inside Passage, 135 km south of Prince Rupert and 70 km from Kitimat. The population is approximately 180 (fluctuating up to 400). It is a 3.5 hour passenger ferry trip or a 1 hour float plane trip from Prince Rupert. There are no stores in the village, although snack foods and pop can be purchased at several private homes. Groceries are purchased in bulk and transported to Hartley Bay dependent on space and weather. There is a

fully equipped nursing station and two nurse practitioners reside, currently temporarily, in the village.

Kitkatla (Gitkxaahla) is located 45 miles southwest of Prince Rupert and has a population of approximately 500. It is accessible by passenger ferry once weekly (1 hour 45 min) or float plane (30 minutes). There are 3 general stores. There is an elementary/junior high school, a community hall, a recreation hall, church, fitness center, and youth community center.

Port Simpson (Lax Kw'alaams) is on the Alaska border, 50 km north of Prince Rupert and accessible only by passenger ferry (1 hour 10 min) four times per week or float plane (15 minutes). The population is 900 with 5% non-Aboriginal. There is a new aquatic/recreational center with a weight room and meeting rooms. There is a convenience store and 2 restaurants and the school is a private academy. Port Simpson was the most recent community to join the Brighter Smiles project.

Participants

Participants were staff and students from schools in the three rural and remote Aboriginal communities described above. All grade levels up to Grade 12 were represented in these schools. Therefore, all students K-12 and their teachers were involved in the AS! BC intervention and invited to participate in the evaluation. One hundred percent of the teachers and administrators in the 3 schools consented to participate in the process evaluation.

Intervention

Action Schools! BC Model

As described previously (P. J. Naylor et al., 2006), the AS! BC model is a ‘whole school model’ that provides tools for schools and teachers to create individualized Action Plans that increase opportunities for PA and HE across six Action Zones. These include; 1) School Environment, 2) Scheduled PE, 3) Classroom Action, 4) Family and Community, 5) Extra-curricular and 6) School Spirit.

The AS! BC model provided teachers (primarily generalists) with enhanced training and resources to implement their Action Plan for their class. Schools had three visits from the AS! BC support team. Teachers received two half-day training sessions: an overview of AS! BC and Classroom Action - PA (half-day Spring 2007) and Classroom Action - HE (Fall 2007). The support team also provided a further in-class refresher mid-year (both PA & HE), student leadership training for indoor and outdoor games, Sport Fit™ training (Winter 2008), and telephone check-ins and consultation (on request). Each teacher received a Planning Guide, a copy of the Action Pages and a Classroom Action Bin (descriptions of the resources have been published previously (P. J. Naylor et al., 2006). The Classroom Action Bin was dedicated to the teacher’s classroom and contained equipment and resources to facilitate Classroom Action (PA & HE) activities (for example enough skipping ropes, dyna-bands, grippers for the class as well as colanders and cutting boards for preparing fruit and vegetables, DVD’s, posters and ‘how-to’ manuals). The PA resources prioritized gender and skill level inclusive activities. Information about these activities and resources can be found at

<http://www.actionschoolsbc.ca/Content/QuickLinks/ASBCSupportandResources.asp>.

Although the model emphasized choice using a whole school framework, Classroom Action was a ‘flagship’ component. Teachers were asked to provide students with a minimum of 15 additional minutes of PA each school day and at least one HE activity per month in the Classroom Action Zone. Teachers provided “physical activity breaks” throughout the school day using a variety of activities and equipment outlined in the Action Pages and/or with equipment provided in the Action Bin. These activities included Hip Hop dancing, skipping, Bounce at the Bell, chair aerobics, yoga and strength work with exercise bands. Most activities required minimal equipment and could be performed in the classroom, hallway or on the school playground (where there was one). DVD-based resources that could be used to lead student sessions were also key resources (e.g. Energy Blasts®, Classroom Workout® and Get Strong video®). Descriptions of the DVDs can be found at http://www.kidsfitnessvideos.com/product_info.php?products_id=20

The AS! BC model was initially designed for and evaluated with students in the upper elementary grades (4-7). The school model was then adapted (a modified selection of resources and activities) for lower elementary (K-3) and middle school (6-9). The schools in these First Nations communities served K-12. Therefore, the AS! BC resources were further adapted by the teachers in each community for use with students in the higher grades. Depending on Grade, teachers were provided with a choice of, and selected from, a variety of grade appropriate activities. Activities were also adapted by the local teachers to enhance the relevance of the activity in the Aboriginal community e.g. Bounce at the Drum (instead of Bell) or introducing more fruit and vegetables into cultural feasts. Each school, in collaboration with the research team, created individualized Action Plans for the whole school year, based on the feedback

provided by students and teachers in the preliminary focus group discussions. As well, individualized physical activity circuits were created for each school.

Design

Based on the history of the project, the relationship with communities and the purpose of the research, we implemented a formative evaluation to explore the feasibility of the model, stakeholder satisfaction, implementation barriers and facilitators, and recommendations for modifications.

Measurement & Analysis

Focus group interviews

To explore early perceptions of feasibility and potential implementation challenges and supports, we conducted semi-structured focus groups with participating teachers and administrators at the sites (n=19) following a brief introduction to the model and prior to implementation (Spring 2007) (see Appendix B). To explore the needs of the students and the match between their needs and the Action Schools! BC model, we also conducted semi-structured focus groups with students across the three communities (n=16) (see Appendix B).

To address feasibility of the model, explore implementation and identify facilitators and barriers to implementation, we conducted semi-structured focus groups with participating teachers and administrators at each of the 3 schools (n=19) following intervention (Spring 2008). Interview schedules addressed satisfaction, benefits of the model, cultural relevance, challenges and supports for implementation and future implementation commitment (see Appendix B).

Focus groups were audio-recorded (digitally) and transcribed verbatim. Transcripts were then coded using NVIVO 2.0 Qualitative Software. Data was reduced into themes by creating nodes of like information. Following the initial analysis of data, themes were reviewed and further reduced. A third and final review of the themes was completed using Microsoft Word. Themes were organized to provide a succinct display of the data and two members of the research team reviewed the transcripts and the data display.

Results

Need

The focus groups with the teachers were held after their introductory workshop. The comments were universally positive. Teachers felt that it was important (...”I know the goal for this program is fitness... but I think there is going to be a side benefit and that is to get the blood flowing to the brain. I think we will find [that] the children will be easier to teach”); they appreciated the information (e.g. “yesterday I was so amazed when I heard about the bones, you do a little bit and it is beneficial, I learned a lot”); and liked the variety and simplicity of resources (e.g. “I think the materials are really well laid out, it is almost like how could you not, its so step-by-step of what you do. You don’t have to do any personal work except to ensure that it happens”). In one school where the focus group was held the day after the workshop, the teachers had already tried it and found it worked very well. Some of the issues that they felt would limit implementation were difficulties doing the activities with the older children, getting the parents on board, and remembering to do the activities.

Key ideas they had for enhancing the cultural appropriateness were integrating the activities with local language (teacher initiated), incorporating traditional foods and activities like seafood and sawing wood, and possibly making the classroom posters using the native language. However, none of the teachers named this as a barrier and some felt that the bottom line was “I would rather teach a healthy child rather than one that isn’t and this will help us do that”... and “ [finding out that almost half of our children were overweight or obese]... that was a major wake up call.”

The focus groups with the children highlighted their interest in and knowledge about the benefits of physical activity and that their parents encouraged them. They felt that options were limited by the size of their community, the availability of facilities, weather, wild animals, computers/video games and teasing/gossiping. They wanted more equipment, more school teams, more group activities, dance classes and more facilities (pool, soccer field, rain cover over the community walkways, etc.). They reported having only ‘junk food’ stores available and limited physical education time (2-3 times per week).

Feasibility

After implementing for over 8-9 months, participants were positive about AS! BC. Twenty-two out of 27 comments about AS! BC represented positive thoughts and feelings. For example, “I think it’s awesome. ... it’s good to see that... the government is actively trying to do something about making the schools more active”, and “I agree [to the above] plus I think it’s great to bring it into the more isolated communities” or “that’s the beauty of it. Those little short bursts that can be used at any time of the day...”. Of the five negative comments, two related to

the evaluation component (e.g. “I just don’t like doing the logs... it’s just one extra thing to do at the end of the day”), one to their workload (e.g. “making the time to do it. It’s just an add-on... but... it is easy to do once you [do it]), and one to students (e.g. “Not negative with the program, but again with the older kids they’re not so interested in doing things and it’s hard to keep them going....”).

When asked why AS! BC went well, the following three key themes emerged:

- Theme 1: Easy to implement
 - “it’s pretty easy for me to [do].. like I said I like the CDs and all of the songs and the dancing and all that and that just goes well with my curriculum
 - “there’s not a lot of time to do these big long lessons about this stuff sometimes, so just to kind of throw it in here and there, is really good I think”

- Theme 2: Motivating
 - “I think the AS! Project is great...it has provided me with an opportunity to really provide some vision for the staff and for the students...over all, I can’t imagine that we would have got as far as we have without AS!”.
 - “and it’s great for the kids to know that it’s not just the teachers here that are expecting them to do this...” but that “...the fact that it is this coordinated program coming from outside....because all of the students know that everybody’s doing it, it’s not just one class... that is across the province... and you know, my kids really like that, that they’re taking part in you know a big thing....”
 - “the kids really enjoyed it”
 - “and the choices they give you, you know empowers teachers to make choices”

- Theme 3: It was well supported
 - “there is a team that visited us early in the year; I think that was always the biggest thing”

- “the fact that we’re getting all of these resources and activities and things to use is pretty amazing, you know”
- “this seems to be one of the most well executed committed programs I’ve seen come through in a while. I mean, you have the follow-ups happening, as well as again I keep saying the resources there, the support, that’s huge.”

In addition, the following quotes highlight the importance of observing changes in the children (Table 1) and the school (Table 2).

Table 1. Quotes regarding the impact that Actions Schools! BC is having on the students.

<p>“...last year they kind of just stood around, they didn’t really do a whole lot. They seem to be playing more, like if there are the skipping ropes...and they were playing four square for a while. Like last year, you had to fight constantly with the DSs [Nintendo DS™] they had out and the MP3s, cause they weren’t doing anything they were just doing those. But, this year they seem to be kind of moving a bit more.”</p>
<p>“I think so, definitely positive. With the health Action Schools, which is new...um..just seeing the kids the other day, which was Earth Day, like gobble up all of those vegetables and be excited about it. Like even a lot of adults who came said they had never tried something like that before. So, just exposure to new...to new eating habits.”</p>
<p>“Yeah, like in my classroom the kids notice, if like we don’t do fitness break that’s the first thing they notice. And the first thing they want, like if we sometimes don’t get time they’re like “oh the fitness break” and they get really upset, so they’re really used to it now.”</p>
<p>“Or if it’s a day like this and it’s sunny they want to go running. Like they already asked me today, “Can we go running this afternoon?”</p>
<p>“At the higher grade level, the snack program...I’m seeing a lot less junk food coming in. Kids aren’t bringing snacks from home; they’re coming with the expectations of having the yogurt and the apple (provided by the AS! BC food grant money), so it’s a definite improvement from my stand point.”</p>

Table 2. Quotes about the impact that Action Schools! BC is having on school changes.

<p>“Some of the staff in [higher grades] are doing AS! activities on a daily basis, and for us that is pretty substantial.”</p>
<p>“Yeah, I would say so, in a positive way, re-examining the snack, and...apply through AFN (Assembly of First Nations) for piloting a breakfast program next year, and we were accepted as 1 of 11 schools, in Canada, and...actually we are having the lady come down tomorrow to look the place over...and that’s all over nutrition, you know having a closer look at snacks and nutrition..”</p>
<p>“We are going to be painting a permanent hop-scotch design out there; we have a tether-ball pole that is going to be erected. We are trying to look for some more playground equipment ...things that promote... activity in general.”</p>
<p>“For Earth Day, normally our traditional Earth Day menu is hotdogs and donuts, but this year we did vegetarian wraps, so we did cheese, and peppers, and cucumbers, and lettuce. ...we are making great inroads in some ways.”</p>
<p>“We’ve done... As well as we can. Our school has been buying Yogurt and the Rotary Club supplies apples, and we’ve done several things like smoothies, and we make cooperative soup...and we are going to do salads and things.”</p>

Barriers

Despite the very positive response to AS! BC, barriers remained. Lack of time, lack of financial resources, high staff turn-over, evaluation requirements, student behaviour, low levels of staff knowledge about their own healthy living and lack of variety were key themes highlighted by the participants as barriers to implementation. In particular, the appropriateness of the resources for older children and the need for enhancing the variety for these children was highlighted. Table 3 displays key quotes which relate to the above themes.

Table 3. Challenges associated with the implementation of Action Schools! BC

Lack of time	“What I was going to say, maybe a disadvantage is make the time to do it. It’s an add-on. And, when you’re curriculum driven, but I think that it’s easy enough to do once you get, just take a quick little break and do it, and then get back. Because it really is time well spent, but at the beginning people think of it is an add-on, but it doesn’t have to be.”
Lack of financial resources	“So, I didn’t have a TV or DVD...So, I uh...the DVDs although I’m sure they are amazing, I didn’t get to use...so that was a bit of a barrier. Although, I think it’s a fabulous resource...I really do, and in a school with more technology, it would probably be really amazing.”
High staff turnover	“The turnover rate can be really high...like next year there is going to be a whole new batch of teachers... are they going to know what the resources are?”
Evaluation Requirements	“I hated filling out those forms when I was in the classroom, because I found that was difficult, but I think you need that push from an outside source, periodically to make sure that you are doing or it will get left.”
Student Behaviour	“I mean a lot of your activities are action orientated, which is great...um...the one thing that I have in my classroom is some kids react...they have a hard time being able to partake in an active break per say, and then be able to refocus their attention, right?”
Lack of Personal Health Knowledge	“I think it could totally be a barrier with someone who is definitely not as health[y]...or active in their daily lives. I think it would totally be a barrier. You can’t just give them a resource package and say “here use this in your classroom.”
Lack of Variety	“I would like more variety of resources. I find the older kids in my room...they get bored very quickly with the same...and even with the variety of equipment we’ve got, you know they have done it so many times that some kind of variety would be really good.”

Facilitators

The fact that AS! BC was easy to implement and that the schools received support from the AS! BC support team were key facilitators to implementation. Focus groups participants also felt that the support would be essential for sustainability. For example, one participant said “*I think as long as there is AS! people coming up...I think it will keep going*” and another commented “*I would like to see if we can’t set up another time early...early in the Fall, maybe even in August for the trainers to come back...sort of showing how to implement all of this into the regular curriculum...that would really help us to keep going*”. The AS! BC support team was asked to return to conduct more training in 2009.

Recommended modifications/adaptations

Participants suggested a number of adaptations that would enhance implementation and the relevance of the model and resources for Aboriginal communities. Participants suggested that enhanced community partnerships, parent education and a greater focus on the First Nations traditions would all improve the program. They also identified that if the model was part of the curriculum, they would have the additional support needed for successful implementation. These participant suggestions are displayed in Table 4.

Table 4. Stakeholder suggestions on how to improve Action Schools! BC

Community Partnerships	<p>“Include the communities. Have the parents involved with this. Because we could talk about apples and oranges ...food all day, but some of these students are still going to be coming to school with pop and chips...in the morning and not eating breakfast.”</p> <p>“...like instead of it being Action Schools it could be Action Communities...spreading it out farther than the school.”</p>
Parent Education	<p>“I think just having...what might be good is...some of the parents can get involved, have the students say...like to make not even a contest, but just who can get out there the longest or the most frequently with their mom or their dad. Either just walking, or biking, or any other type of exercise, and just include the parents in it and just see what comes about.”</p>
First Nations Traditional Focus	<p>“But we have to encourage...the traditional diet, you know, a lot more, but the fact is...it’s so much cheaper to buy a box of potato chips, rather than a box of apples, and...going back and having some of the stuff that’s so available to us from the sea.”</p> <p>“You could redo the posters in our native language Sawing wood, carrying wood, maybe we need to bring some of that type of activity in, where as a school it is a service, we would take wood to the smoke house for the elders.”</p> <p>“You do have to focus on the traditional foods and everything, but I think that you have to be realistic and think about how many live traditionally, that they don’t. So, I know that we could encourage that, but I think that you have to be realistic, too.”</p>

<p>Include in curriculum (even across curriculum)</p>	<p>“If the BC Ministry of Education took it in as part of the curriculum it would be...there would be a lot more support for it...people would maintain it and not drop the ball...it would be easier to implement.”</p> <p>“If any of the um...the Action School’s activities could be related to curriculum that we have to give to them, you know we have to use anyways, so if there was a Language Arts component, like the...the riddles, the veggie riddle cards, I use those in my language groups. Because it’s describing something. Giving a riddle is a good language activity. So, if in anyway they could be incorporated into Language Arts and Math that would be really, you know, really useful.”</p>
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Discussion

Action Schools! BC represented several of the best practice principles for implementing community-based interventions in Aboriginal communities outlined by Potvin (Potvin et al., 2003) and Ho (Ho et al., 2006). It was flexible, it engaged the community school stakeholders in planning and implementation and it provided learning opportunities for staff and students. At the school level, teachers and administrators chose the activities most suitable for their own school.

Based on the focus groups at the outset, AS! BC met a perceived health need in the communities, addressed many of the teachers needs (simple, supported), and provided more activities for the children and youth. Stakeholders wanted both the physical activity and healthy eating components, and training and resources were provided for both. To address their concerns about the older children, AS! BC provided leadership training (older students were trained to

lead activities with younger students). AS! BC did not address the lack of facilities specifically, although through the School Environment zone, school staff initiated plans to add playground equipment and provide playground markings for games. Cultural adaptations were undertaken by the teachers individually during the pilot to allow the AS! BC support team to base any larger scale adaptations to the resources on a year of experiences using the model within these communities.

Feedback from the second set of focus groups, after one year of implementation, was remarkably consistent with the initial focus groups. We found that AS! BC was feasible and well accepted in these rural and remote Aboriginal BC communities. However, cultural adaptations were recommended, specifically related to food and language. Some individual teachers made adaptations to make the activities more culturally relevant, while others did not. Some modified cultural events to make them more health relevant. Our data and both the Kahnawake and Sandy Lakes schools research clearly indicated the importance of these cultural adaptations (Macaulay et al., 1997; Saksvig et al., 2005).

AS! BC provided planning tools, training, classroom resources and ongoing facilitation to support implementation. These resources and ongoing support and facilitation were identified as critical to implementation and sustainability at both baseline and follow-up.

Although Action Schools! BC incorporates family and community within the whole-school model, our stakeholders felt that this component needed to be enhanced. Independent community initiatives were being planned, but were not necessarily implemented during the pilot

of the AS! BC model. Many of the researchers involved with Aboriginal/First Nations communities have emphasized the need for a multi-setting and multi-level approach, not only to shift the social culture within the overall community, but also to allow for integration of theoretical and cultural concepts and provide the space for active involvement of a variety of community members (Gittelsohn et al., 1999; Ho et al., 2006; Potvin et al., 2003; Saksvig et al., 2005).

Barriers to implementation cited in this project were similar to those identified in previous research in Aboriginal schools. Lack of time, health attitudes of some teachers, and staff turn-over were all barriers we found in common with other Aboriginal interventions (Gittelsohn et al., 1999) and other school-based literature (P. J. Naylor et al., 2006). Action Schools! BC is uniquely non-curricular in the Classroom Action zone, in that it focuses on ‘doing’ enjoyable physical activity rather than learning about it cognitively in a didactic teaching format. As a result, some of the teachers (from higher grade levels) identified the potential for disruptive student behaviour as a barrier and mentioned treating these activities as optional. Financial resources were cited as a potential barrier to the hands-on healthy eating activities like fruit and vegetable tasting sessions. Ongoing financial support is currently available through an AS! BC food grant that schools can access annually. The teachers in our study emphasized that evaluation activities like tracking were also a burden.

Providing ongoing support to rural and remote communities was challenging and will be an issue for “scaling up” health promotion initiatives in these and other Aboriginal communities. Both the AS! BC support and research teams had to fly, boat or travel long distances in and out

of some of the communities and transportation was expensive and limited by inclement weather. Creating a network of regional Aboriginal trainers and measurement teams (if further evaluation is being conducted) that reside in First Nations communities is a potential solution and a key recommendation from the Kahnawake evaluation (Potvin et al., 2003). Conversely, participants felt part of a larger initiative because the AS! BC support team traveled to them. The importance of this inclusion to the participants warrants consideration.

Summary

Adaptation of existing school models, if they are flexible and allow for community involvement and control, is a cost-effective option for promoting health in Aboriginal communities. Action Schools! BC, as such a model, is appropriate for broader dissemination to Aboriginal communities. We need to facilitate affordable localized cultural adaptations and support for rural and remote locations because of their specific challenges. Collaboration with Aboriginal health organizations provincially and locally, and the provision of training for local community stakeholders appears to be a viable way forward.

To respond to the needs identified in this research, the AS! BC support team has formed a partnership with the First Nations Health Council and Aboriginal Act Now (a government funded initiative) to hire an Action Schools! BC First Nations Coordinator. The First Nations Coordinator is working with partners to identify opportunities for integrating Aboriginal resources and culture, and is currently enhancing the inclusion of traditional Indigenous foods into the resources.

References

- Altman, D. G. (2009). Challenges in sustaining public health interventions. *Health Education & Behavior : The Official Publication of the Society for Public Health Education*, 36(1), 24-8; discussion 29-30.
- Brown, T., & Summerbell, C. (2009). Systematic review of school-based interventions that focus on changing dietary intake and physical activity levels to prevent childhood obesity: An update to the obesity guidance produced by the national institute for health and clinical excellence. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 10(1), 110-141.
- Day, M. E., Strange, K. S., McKay, H. A., & Naylor, P. J. (2008). Action schools! BC--healthy eating: Effects of a whole-school model to modifying eating behaviours of elementary school children. *Canadian Journal of Public Health. Revue Canadienne De Sante Publique*, 99(4), 328-331.
- Dzewaltowski, D. A., Estabrooks, P. A., Klesges, L. M., Bull, S., & Glasgow, R. E. (2004). Behavior change intervention research in community settings: How generalizable are the results? *Health Promotion International*, 19(2), 235-245.
- Federal, Provincial, Territorial Advisory Committee on Population Health. (1999). *Towards a healthy future: Second report on the health of Canadians*. Ottawa: Minister of Public Works and Government Services Canada.

- Fox, K. R., Cooper, A., & McKenna, J. (2004). The school and promotion of children's health-enhancing physical activity: Perspectives from the united kingdom. *J Sch Health*, 23, 338-358.
- Franks, A. L., Kelder, S. H., Dino, G. A., Horn, K. A., Gortmaker, S. L., Wiecha, J. L., et al. (2007). School-based programs: Lessons learned from CATCH, planet health, and not-on-tobacco. *Preventing Chronic Disease: Public Health Research, Practice, and Policy*, 4(2), 1-9.
- Fuentes, R. M., Notkola, I. L., Shemeikka, S., Tuomilehto, J., & Nissinen, A. (2003). Tracking of body mass index during childhood: A 15-year prospective population-based family study in eastern Finland. *International Journal of Obesity and Related Metabolic Disorders : Journal of the International Association for the Study of Obesity*, 27(6), 716-721.
- Gittelsohn, J., Evans, M., Story, M., Davis, S. M., Metcalfe, L., Helitzer, D. L., et al. (1999). Multisite formative assessment for the pathways study to prevent obesity in American Indian schoolchildren. *The American Journal of Clinical Nutrition*, 69(4 Suppl), 767S-772S.
- Glasgow, R. E. (2008). What types of evidence are most needed to advance behavioral medicine? *Annals of Behavioral Medicine : A Publication of the Society of Behavioral Medicine*, 35(1), 19-25.
- Health Canada Aboriginal Diabetes Initiative. (2001). *Diabetes among aboriginal (first nations, Inuit and Métis) people in Canada: The evidence* Health Canada.

- Himes, J. H., Ring, K., Gittelsohn, J., Cunningham-Sabo, L., Weber, J., Thompson, J., et al. (2003). Impact of the pathways intervention on dietary intakes of American Indian schoolchildren. *Preventive Medicine, 37*(6 Pt 2), S55-61.
- Ho, L. S., Gittelsohn, J., Harris, S. B., & Ford, E. (2006). Development of an integrated diabetes prevention program with first nations in Canada. *Health Promotion International, 21*(2), 88-97.
- Janz, K. F., Dawson, J. D., & Mahoney, L. T. (2000). Tracking physical fitness and physical activity from childhood to adolescence: The muscatine study. *Medicine and Science in Sports and Exercise, 32*(7), 1250-1257.
- Katzmarzyk, P. T. (2008). Obesity and physical activity among aboriginal Canadians. *Obesity (Silver Spring, Md.), 16*(1), 184-190.
- Kirby, M. J., & LeBreton, M. (2002). *The health of Canadians- the federal role*. Ottawa: The Standing Senate Committee on Social Affairs, Science and Technology, Parliament of Canada.
- Liu, J., Young, T. K., Zinman, B., Harris, S. B., Connelly, P. W., & Hanley, A. J. (2006). Lifestyle variables, non-traditional cardiovascular risk factors, and the metabolic syndrome in an aboriginal Canadian population. *Obesity (Silver Spring, Md.), 14*(3), 500-508.
- Macaulay, A. C., Paradis, G., Potvin, L., Cross, E. J., Saad-Haddad, C., McComber, A., et al. (1997). The Kahnawake schools diabetes prevention project: Intervention, evaluation, and baseline results of a diabetes primary prevention program with a native community in Canada. *Preventive Medicine, 26*(6), 779-790.

Macdonald, H. M., Kontulainen, S. A., Khan, K. M., & McKay, H. A. (2007). Is a school-based physical activity intervention effective for increasing tibial bone strength in boys and girls? *Journal of Bone and Mineral Research : The Official Journal of the American Society for Bone and Mineral Research*, 22(3), 434-446.

Macdonald, H. M., Kontulainen, S. A., Petit, M. A., Beck, T. J., Khan, K. M., & McKay, H. A. (2008). Does a novel school-based physical activity model benefit femoral neck bone strength in pre- and early pubertal children? *Osteoporosis International : A Journal Established as Result of Cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*, 19(10), 1445-1456.

MacMillan, H. L., MacMillan, A. B., Offord, D. R., & Dingle, J. L. (1996). Aboriginal health. *CMAJ : Canadian Medical Association Journal = Journal De l'Association Medicale Canadienne*, 155(11), 1569-1578.

Macnab, A. J., Rozmus, J., Benton, D., & Gagnon, F. A. (2008). 3-year results of a collaborative school-based oral health program in a remote first nations community. *Rural and Remote Health*, 8(2), 882.

Malina, R. M. (1996). Tracking of physical activity and physical fitness across the lifespan. *Research Quarterly for Exercise and Sport*, 67(3 Suppl), S48-57.

Mossberg, H. O. (1989). 40-year follow-up of overweight children. *Lancet*, 2(8661), 491-493.

Mullen, P. D., Evans, D., Forster, J., Gottlieb, N. H., Kreuter, M., Moon, R., et al. (1995). Settings as an important dimension in health education/promotion policy, programs, and research. *Health Education Quarterly*, 22(3), 329-345.

Nagarajan, K. V. (2004). Rural and remote community health care in Canada: Beyond the kirby panel report, the romanow report and the federal budget of 2003. *Canadian Journal of Rural Medicine : The Official Journal of the Society of Rural Physicians of Canada = Journal Canadien De La Medecine Rurale : Le Journal Officiel De La Societe De Medecine Rurale Du Canada*, 9(4), 245-251.

Naylor, P., Macdonald, H. M., Reed, K. E. & McKay, H. A. (2006). *Action schools! BC: A socio-ecological approach to modifying chronic disease risk factors in elementary school children. preventing chronic disease: Public health research, practice, and policy.* Retrieved 03/25, 2009, from http://www.cdc.gov/pcd/issues/2006/apr/05_0090.htm

Naylor, P. J., Macdonald, H. M., Zebedee, J. A., Reed, K. E., & McKay, H. A. (2006). Lessons learned from action schools! BC--an 'active school' model to promote physical activity in elementary schools. *Journal of Science and Medicine in Sport / Sports Medicine Australia*, 9(5), 413-423.

Naylor, P. J., & McKay, H. A. (2009). Prevention in the first place: Schools a setting for action on physical inactivity. *British Journal of Sports Medicine*, 43(1), 10-13.

Paradis, G., Levesque, L., Macaulay, A. C., Cargo, M., McComber, A., Kirby, R., et al. (2005). Impact of a diabetes prevention program on body size, physical activity, and diet among kanien'keha:Ka (mohawk) children 6 to 11 years old: 8-year results from the kahnawake schools diabetes prevention project. *Pediatrics*, 115(2), 333-339.

Potvin, L., Cargo, M., McComber, A. M., Delormier, T., & Macaulay, A. C. (2003).

Implementing participatory intervention and research in communities: Lessons from the

- Kahnawake schools diabetes prevention project in Canada. *Social Science & Medicine* (1982), 56(6), 1295-1305.
- Reed, K. E., Warburton, D. E., Macdonald, H. M., Naylor, P. J., & McKay, H. A. (2008). Action schools! BC: A school-based physical activity intervention designed to decrease cardiovascular disease risk factors in children. *Preventive Medicine*, 46(6), 525-531.
- Ritenbaugh, C., Teufel-Shone, N. I., Aickin, M. G., Joe, J. R., Poirier, S., Dillingham, D. C., et al. (2003). A lifestyle intervention improves plasma insulin levels among Native American high school youth. *Preventive Medicine*, 36(3), 309-319.
- Roberts-Gray, C., Gingiss, P. M., & Boerm, M. (2007). Evaluating school capacity to implement new programs. *Evaluation and Program Planning*, 30(3), 247-257.
- Saksvig, B. I., Gittelsohn, J., Harris, S. B., Hanley, A. J., Valente, T. W., & Zinman, B. (2005). A pilot school-based healthy eating and physical activity intervention improves diet, food knowledge, and self-efficacy for native Canadian children. *The Journal of Nutrition*, 135(10), 2392-2398.
- Sharma, M. (2007). International school-based interventions for preventing obesity in children. *Obesity Reviews : An Official Journal of the International Association for the Study of Obesity*, 8(2), 155-167.
- Story, M., Snyder, M. P., Anliker, J., Weber, J. L., Cunningham-Sabo, L., Stone, E. J., et al. (2003). Changes in the nutrient content of school lunches: Results from the pathways study. *Preventive Medicine*, 37(6 Pt 2), S35-45.

- Trudeau, F., Laurencelle, L., & Shephard, R. J. (2004). Tracking of physical activity from childhood to adulthood. *Medicine and Science in Sports and Exercise*, 36(11), 1937-1943.
- van Sluijs, E. M., McMinn, A. M., & Griffin, S. J. (2008). Effectiveness of interventions to promote physical activity in children and adolescents: Systematic review of controlled trials. *British Journal of Sports Medicine*, 42(8), 653-657.
- Wahi, G., Zorzi, A., Macnab, A., & Panagiotopoulos, C. (2009). Prevalence of type 2 diabetes, obesity and the metabolic syndrome among Canadian First Nations children in a remote pacific coast community. *Paediatrics & Child Health*, 14(2): 79-83.
- Wharf-Higgins, J., Naylor, P., & Day, M. (2008). Seed funding for health promotion: Sowing sustainability or skepticism? *Community Dev J*, 43(2), 210-221.
- Young, T. K., Dean, H. J., Flett, B., & Wood-Steiman, P. (2000). Childhood obesity in a population at high risk for type 2 diabetes. *The Journal of Pediatrics*, 136(3), 365-369.
- Young, T. K., & Katzmarzyk, P. T. (2007). Physical activity of aboriginal people in Canada. *Canadian Journal of Public Health. Revue Canadienne De Sante Publique*, 98 Suppl 2, S148-60.
- Young, T. K., Reading, J., Elias, B., & O'Neil, J. D. (2000). Type 2 diabetes mellitus in Canada's first nations: Status of an epidemic in progress. *CMAJ : Canadian Medical Association Journal = Journal De l'Association Medicale Canadienne*, 163(5), 561-566.

Appendix A

Descriptors of AS! BC resources cited in Day et al 2008

1. *Six Action Zones*: The model incorporates planning within the following six Action Zones based upon local needs and identified by representatives of the whole-school community.
 - a) School Environment, which strives to make the healthy choices the easy choices by creating safe and inclusive physical environments and promoting policies that support healthy living. Examples:
 - Physical Activity/Physical Education – sustain and increase the number of permanent play equipment and painted playground markings on tarmac surfaces to promote spontaneous physical activity
 - Healthy Eating – develop and implement policies that address healthy food choices including vending machines and food services
 - b) Scheduled Physical Education, which provides an annual physical education calendar of ideas and best practice resources that support the Ministry of Education recommended time allotment of scheduled physical education per week and nutrition education. Examples:
 - Physical Activity/Physical Education – encourage teachers to plan the year and share resources and success stories amongst each other
 - Healthy Eating - invite a sports nutritionist to talk to your class
 - c) Classroom Action, which provides creative, alternative classroom physical activity and healthy eating ideas that complement and support physical and nutrition education, and build healthy bodies and minds. Examples:

- Physical Activity/Physical Education - ‘Snack’ on physical activity throughout the day (15 minutes) using resources such as Bounce at the Bell and Energy Blast videos (see www.actionschoolsbc.ca).
 - Healthy Eating – incorporate healthy eating messages into regular classroom scheduling by implementing activities from the Classroom Healthy Eating Action Resource
- d) Family and Community, which fosters the development of partnerships with families and community practitioners to benefit from the wealth of resources available to promote and encourage healthy living. Examples:
- Physical Activity/Physical Education – support students gaining community activity experiences such as rock climbing, skating, skiing, swimming, hiking or curling
 - Healthy Eating – provide nutrition workshops or student/parent cooking classes based on nutrition guidelines
- e) Extra-Curricular, which supports a variety of opportunities for students, staff and families to engage in physical activity and healthy eating activities before and after school, and during lunch and recess. Examples:
- Physical Activity/Physical Education – offer non-traditional intramurals (e.g. yoga, dance, aerobics) to entice more students to become involved
 - Healthy Eating – establish healthy food guidelines for hot lunch programs
- f) School Spirit, which cultivates school spirit by encouraging physical activity, supporting healthy eating choices, and celebrating the benefits of healthy living for the whole school. Examples:

- Physical Activity/Physical Education – during school assemblies showcase physical activities (e.g. dances, combatives, Inuit games)
 - Healthy Eating – create a School Cookbook focusing on fruit and vegetable recipes
2. *Action Teams*: AS! BC schools establish an Action Team comprised of administrators, teachers, parents, students and identified community practitioners. The Action Team develops an individualized Action Plan that addresses goals based on identified needs within each of the six Action Zones.
 3. *Planning Guide* for Schools and Teachers: The Planning Guide is a resource that includes: 1) a set of inventories to guide the Action Team in the development of the Action Plan, and 2) creative ideas to support the Action Team achieve their goals in the six Action Zones as established in their Action Plan.
 4. *Action Pages!*: This user-friendly resource links teachers, parents, coaches and community practitioners to the multitude of resources available to support healthy living in school children.
 5. *Classroom Action Resource*:
 - a) The Classroom Action Resource for physical activity provides classroom teachers with creative, alternative physical activity ideas that complement scheduled physical education and support the Ministry of Education recommended time allotment of 150 minutes of physical education per week. The goal is to provide 15 minutes of physical activity a day, each day of the school week (in addition to the scheduled physical education).

- b) The Classroom Healthy Eating Action Resource is a curriculum resource that is organized based on grade-specific prescribed learning outcomes. It provides teachers with a menu of creative classroom healthy eating activities that focus on fruit and vegetable knowledge, awareness and consumption. The activities incorporate opportunities for both the learning about, and tasting of, fruits and vegetables. Every participating teacher is provided with a grant of \$12.50 per month with which to purchase fruit and vegetables for classroom tasting activities.
6. *Action Bins*: support the physical activities and healthy eating activities recommended in the classroom action resources.
- a) The Physical Activity Action Bin includes posters, DVDs, books, games, playground balls, skipping ropes, exercise bands, strength grippers, teaching resources and all other materials necessary to implement the Classroom Action Resource activities.
 - b) The Healthy Eating Action Bin includes posters, DVDs, books, games, food preparation utensils, a cooler, teaching materials and all other materials that are necessary to implement the Classroom Healthy Eating Action Resource activities.
7. *AS! BC Support Team*: The AS! BC Support Team facilitates a comprehensive training workshop to ensure that the teachers are adequately prepared to implement the activities and utilize the resources provided. The Support Team also provides ongoing consultation and support to schools and teachers.

Appendix B: Interview schedules

TEACHER'S INTERVIEW SCHEDULE (Baseline)

1. What do you think about the Action Schools project?
2. What factors do you think facilitated the implementation of Action Schools?
3. What factors do you think were barriers to the implementation of Action Schools?
4. What do you think of the role of the Action School BC regional facilitator during implementation?
5. What impact (+/-) has Action Schools B.C.! had in the schools? the school district?
 - Probe: Has your school become involved in other initiatives or activities as a result of AS! BC?
6. What is the likelihood that your school will continue implementing Action Schools?
7. What factors will influence the continued use of Action Schools in your school?
8. Do you have any new or existing partnerships with the community that support your efforts to implement AS! BC
 - Yes /No (circle)
 - If yes, what is the nature of the partnership (do they come in and help, do they provide low cost alternatives etc.)
9. Do you share information about Action Schools! BC with others?
 - Yes /No (circle) (why do you think this happens)
 - If so, who do you share info. With
10. If you were asked to expand Action Schools! BC how would you describe your school's capacity to do this?
 - prompt e.g. add more minutes, add healthy eating component etc.

11. What improvements could be made to the Action Schools Initiative to enhance its chances of success in other schools and classrooms?

12. What have we missed that you feel is important to say?

STUDENT FOCUS GROUP INTERVIEW QUESTIONS

1. What or whom do you think influences your physical activity?

2. How do you feel about physical activity?

3. Why do you think that physical activity is important for you? For your parents?

4. What has influenced you to think that physical activity is important?

5. In what ways do you influence your parents to be physically active?

6. Describe to me your parents' physical activity.

7. In what ways does your parent influence you to be physically active?

8. How does this make a difference in your own physical activity?

9. What do you think about Action Schools! BC (following description)?

10. What would be your favourite activities to do in Action Schools! BC? Why?

11. What would be your least favourite activities to do Action Schools! BC? Why?

12. Have you made any changes because of Action Schools! BC?

-Describe for me some examples.

13. What has changed at your school because of Action Schools! BC?

TEACHER/ADMINISTRATOR'S INTERVIEW SCHEDULE (POST)

1. What do you think about the Action Schools project?
2. What factors do you think facilitated the implementation (made doing) of Action Schools (go well)?
3. What factors do you think were barriers to the implementation made Action Schools difficult?
4. What do you think of the role of the Action School BC regional facilitator during implementation? How did it work having the support of the Action School trainer and support team at a distance? How did it work having AS trainer and support team come up...and provide specific telephone support?
5. What impact (+/-) has Action Schools B.C.! had in your school?

Probe: Has your school become involved in other initiatives or activities as a result of AS! BC?

6. What is the likelihood that your school will continue implementing Action Schools?
7. What factors will influence the continued use of Action Schools in your school?
8. What new or existing partnerships with your community or other schools that support your efforts to implement AS! BC

If yes, what is the nature of the partnership (do they come in and help, do they provide low cost alternatives etc.)

9. In what way do you share information about Action Schools! BC with others?

- If so, who do you share info. With

10. If you were asked to expand Action Schools! BC how would you describe your school's capacity to do this?

Prompt: e.g. add more minutes, add healthy eating component etc.

11. What improvements could be made to the Action Schools Initiative to enhance its chances of success in other remote rural Aboriginal schools and classrooms?

12. What have we missed that you feel is important to say?