

Trimming the Fat: School-based Child Obesity Prevention in British Columbia

by

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Abstract

This study investigates ways to improve the health and well-being of children in British Columbia (BC) through the education system. Despite BC's efforts, many BC children do not consume a healthy diet at school. A broad examination of case studies is used to ascertain common criteria for a health promoting school, while a detailed analysis of these criteria confirm that they are indeed indispensable for BC. Drawing on these findings, I formulate three policy options and conduct a policy analysis. The policy options are evaluated based on their ability to meet four criteria: effectiveness, cost, implementation complexity, and key stakeholder acceptability. Results indicate that legislating and enforcing the Guidelines for Food and Beverage Sales in BC Schools is the best option for BC in improving the health and well-being of schoolchildren. I recommend the legislation and enforcement of the Guidelines to the BC Ministry of Education because of the policy options ability to improve the school food environment, reduce child obesity prevalence, relative low costs, and ease of implementation.

Keywords: child obesity; school nutrition; prevention; policy; British Columbia; recommendations

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Executive Summary

Since the 1990's, British Columbia (BC) has been making efforts to improve the health and well-being of children through the education system. Despite BC's efforts, many children in BC do not consume a healthy diet at school. This is concerning because unhealthy eating habits that are formed in childhood continue into adulthood. Moreover, unhealthy eating habits often manifest in the form of obesity. The health consequences of obesity represent a serious challenge for BC's healthcare system. Obesity significantly increases the risk of developing certain chronic diseases. The economic costs of obesity on BC's healthcare system are significant, estimated to cost BC \$730 million to \$780 million per year.

This study attempts to address the current gaps in BC's school nutrition policy by identifying what criteria are indispensable for an effective school nutrition policy. Three case studies are examined that have been successful in improving children's health through the education system. The three case studies selected for investigation are: the Annapolis Valley Health Promoting Schools (AVHPS) initiative in Nova Scotia, Singapore, and England. Case studies are assessed based on their ability to address a Comprehensive School Health framework, which is an adaptation of the World Health Organization's health promoting school principles. Findings indicate that the case studies examined demonstrate the following criteria that are not present in BC's school nutrition policy: training for food service suppliers, school nutrition standards that are being complied with, and affordable and accessible healthy food options (with the exception of Singapore). A scan of the literature confirmed the importance of these criteria for improving the health and well-being of school children.

These findings helped formulate the following policy options for British Columbia:

1. Training for food service staff: This policy option involves the training of food service suppliers to give suppliers the knowledge to change their food menus at schools to better meet school nutrition standards.
2. Subsidize healthy foods: This policy option aims to make healthy foods more affordable for students who are purchasing food at school, and to make healthy foods more accessible to students by eliminating the price barrier for schools in complying with school nutrition standards.
3. Legislate and enforce Guidelines: This policy option necessitates the legislation of the Guidelines for Food and Beverage Sales in BC Schools. Once legislated, a governing body would be established to investigate and to ensure that schools are continually adhering to the Guidelines.

A policy analysis is conducted to determine which of these three policy options is the best option for BC in improving the health and well-being of schoolchildren. The policy options are evaluated based on their ability to meet the following criteria: effectiveness, cost, implementation complexity, and key stakeholder acceptability. The results of the analysis indicate that policy option three, legislate and enforce Guidelines, scores the highest among the policy options. The high score is primarily because of the policy option's high degree of effectiveness, low costs, and ease of implementation.

Chapter 1. Introduction

Obesity rates in children have grown to epidemic proportions over the past thirty years. According to Stats Canada (2012), close to one-third of all Canadian children are either overweight (19.8%) or obese (11.7%). Internationally, Canada has the third worst child obesity rates, only behind Greece and the United States (UNICEF Canada, 2011). Child obesity is a concern because it not only increases the likelihood of being obese as an adult, but it can also contribute to the early onset of a number of health-related problems.

The health consequences of obesity represent a serious challenge for the Canadian healthcare system. Obesity significantly increases the risk of several chronic diseases including; coronary heart disease, stroke, gallbladder disease, Type 2 diabetes, cardiovascular disease, osteoarthritis, sleep apnea, and certain kinds of cancer (Health Canada, 2006). Obese individuals are 50 to 100 percent more likely to die pre-maturely than their non-obese counterparts. The economic costs of obesity on Canadians are substantial and increasing. In 2008, the total cost of obesity to Canadians was \$4.6 billion; \$1.98 billion in direct costs (hospital care, pharmaceuticals, physician care) and \$2.63 billion in indirect costs (lost economic productivity) (Public Health Agency Canada, 2009). Rising obesity-related costs could impose a threat to the future fiscal viability of the British Columbian healthcare system, making obesity more than a private issue. With a healthcare system that is already struggling to prepare for the increased costs associated with an aging population, the repercussions of increasing

obesity rates in Canada necessitate the need for policy intervention. Schools are recognized as an effective setting to influence the eating habits and subsequent health outcomes of children. The current eating habits of children in British Columbia (BC) schools are less than ideal. The majority of students in Vancouver schools do not consume any fruits, vegetables, whole grains, and low-fat milk/soy during school hours, although many are consuming sugar-sweetened beverages (Rojas et al, 2013). Although no data is available to determine the eating habits of school children in areas of BC outside of Vancouver, it is reasonable to assume similar results. A healthy diet rich in fruits and vegetables is important in protecting children against developing obesity.

This study focuses on the role schools can play in the formation and monitoring of children's eating habits. Chapter 2 of this report analyzes the causes for the rise in obesity rates, and identifies direct and indirect risk factors that increase a child's likelihood of being obese. Chapter 3 examines critical periods of a child's development that are associated with fat cell growth. Chapter 4 of this report examines the relationship between obesity and academic performance, and outlines the impetus for addressing obesity through the education system. Chapter 5 examines the obesity issue in the context of British Columbia, and identifies institutions in BC schools that are in place to promote child health and development. Chapter 6 outlines the policy problem in BC. Chapter 7 discusses the methodology used in this research, which includes both primary and secondary research. Chapter 8 describes three case studies that have successfully improved child health through school nutrition policies, and analyzes each case study using the World Health Organization's Health Promoting School principles. BC's school nutrition policy is then compared to the common characteristics in the three case studies in an effort to highlight gaps in BC's school nutrition policy. Chapter 9

states the policy objectives, criteria and measures used to analyze policy options, and describes each of the policy options. Chapter 10 presents the results of policy option analysis, and provides a final policy recommendation. Chapter 11 provides concluding remarks, including the limitations of this research.

Chapter 2. Obesity Definition and Risk Factors

2.1. Health at Every Size

There can be some danger in focusing on exclusively body weight as an indicator of health. First, focusing on body weight can lead children to fall victim to weight stigmatization and sized-based bullying (Shelly et al, 2010). Second, some obese children are healthy. Conversely, some children who are not obese are unhealthy. The Health at Every Size (HAES) model recognizes that healthy children come in a variety of body shapes and sizes (Shelly et al, 2010). Rather than being focused predominantly on achieving a healthy weight, HAES emphasizes healthy lifestyles. HAES proposes that health is a result of behaviours that are independent of body weight (Miller and Jacob, 2001). It is clear that obesity is not a perfect measure for health. However, it is widely used in the literature, including the World Health Organization (2008) as a proxy for healthy schoolchildren. As a result, throughout this study I use obesity as a measure of good health.

Obesity is a condition caused by excessive fat deposits in the body that occurs when there is an imbalance between energy intake (proteins, fats, and carbohydrates) and energy expenditure (metabolic rate and physical activity; Alberga et al., 2011). The Body Mass Index (BMI) is a measure for obesity in adults and children. It is calculated by dividing a person's weight by his/her height. A person whose BMI is greater than or equal to 30 is classified as obese.

Obesity is a complex disorder that is influenced by a combination of direct and indirect and indirect risk factors.

2.2. Direct Risk Factors

The direct risk factors are genetics, social environment, and behaviour. First, certain genes pre-dispose an individual to develop obesity. A “thrifty” gene that helped cavemen store excess amounts of fat during times of food scarcity appears to be an underlying trigger for obesity (Baig et al, 2011). To examine the underlying role genetics play in developing obesity, twin and adoption studies have been conducted. They suggest that hereditary factors may be responsible for up to 80% of BMI variance (Moleres et al, 2012). The remainder of BMI variance is largely credited to social environmental and behavioural factors.

Second, the increase in obesity rates over a relatively short period of time exemplifies the role that the social-environment plays in obesity. According to the Public Health Agency of Canada (2011) adult obesity rates increased from 14% to 25% between 1978 and 2008. Obesity rates in children are also on the rise. Changes in Canada’s social environment are impacting the way individuals interact with food. The food landscape in Canada has drastically changed over the past thirty years. Large commercial farms are slowly displacing small-scale farmers, creating a disconnection between food and the farmers who grew it (Stats Canada, 2009). The country is increasingly becoming more dependent on other countries for food. Since 2000, food imports have increased by 50 percent in Canada (Canadian Agri-Food Policy Institute, 2011). Anecdotal evidence suggests that time constraints on families have made it increasingly more difficult to prepare nutritious meals, and have increased Canadians’

dependence on pre-packaged food and eating out at restaurants. Prevalence of convenience stores and fast-food outlets are known to contribute to higher obesity rates, regardless of neighbourhood socio-economic status, sex, age, or education (Spence et al, 2009). Collectively, local farmland displacement, easy access to fast-food, processed foods, and junk food, larger portion sizes, and time constraints are all changes in Canada's social-environment that are making it increasingly more difficult for Canadians to maintain a healthy weight. Immigrants and First Nations are especially susceptible to becoming obese because of the challenges faced by these groups in transitioning away from their traditional diets and lifestyles to a western diet and lifestyle (Bruce et al, 2011).

Third, behavioural risk factors are any behaviour that leads to obesity and obesity-related health problems. Behavioural risk factors represent the easiest causes of obesity to modify. Two modifiable behavioural risk factors known to increase the likelihood of developing obesity are: physical activity and diet.

Lack of physical activity is associated with obesity and obesity-related health problems. The majority of Canadians do not get enough physical activity. Only 5 percent of Canadian adults meet the World Health Organization's recommendation of 30 minutes of physical activity on at least 5 days of the week (Colley et al., 2011). Children are also not physically active enough. According to the Canadian Physical Activity Levels Among Youth study (2009), 88 percent of children aged 5-19 do not meet the guidelines of Canada's Physical Activity Guide (Public Health Agency of Canada, 2011). Lack of physical activity limits the amount of energy expelled during the day. Energy that is not expelled gets stored in the body as fat. Overtime, excessive fat deposits in the body can lead to obesity. The Public Health Agency of Canada (2011) shows that adults and children nowadays are living a more sedentary lifestyle. Sedentary behaviour is any

activity where there is minimal physical movement (television watching, playing video games, occupational sitting). The majority of Canadian children exceed the guidelines of two hours or less in front of a television. Excessive time being sedentary increases the chances of developing obesity.

Canadians today are consuming more calories than in the past, and an increasing amount of calories from salad oils, wheat flour, sugary soft drinks, shortening, rice, chicken, and cheese (Slater et al, 2009). There is reason to be concerned over this trend. Fat is deposited in the body when caloric intake exceeds the amount of calories burned. Over time, fat deposits build up in the body and often lead to obesity. Consuming fruits and vegetables is an important way to regulate weight and prevent the onset of obesity (Health Canada, 2013). Canada's Food Guide to Healthy Eating recommends eating 5 to 10 servings of fruits and vegetables per day. However, the majority of Canadians do not consume enough fruits and vegetables to meet their daily requirements. Bad eating habits between meals are also associated with obesity. Individuals who skip breakfast, consume sugary beverages between meals, and snack or eat while watching television are more likely to be obese than individuals who do not (Public Health Agency of Canada, 2011).

2.3. Indirect Risk Factors

Indirect factors are: socio-economic status, geographical location, and parental role modeling. First, low-income Canadians are more likely to be obese than their high-income counterparts (Veugelers and Fitzgerald, 2005). There are several reasons for this relationship between income and obesity prevalence. The first relates to the behavioural risk factor, physical activity. Low-income individuals are not as physically

active as their high-income counterparts (Taylor et al, 1998). Characteristics typical of low-income neighbourhoods present difficulties to individuals who want to be physically active. Low-income neighbourhoods have fewer recreational facilities and physical fitness equipment making it more difficult to exercise regularly (Ferreira et al, 2006). There are also fewer opportunities for children in low-income neighbourhoods to be physically active due to the high-cost of participating in organized sports. Moreover, high crime rates found in low-income neighbourhoods can make it unsafe for children to play in neighbourhood public parks (Jannsen et al, 2006).

The second reason for the relationship between income and obesity prevalence is the behavioural factor, diet. Children from low-income families are less likely to consume a healthy diet (St John et al, 2008). The low-cost, convenient nature of energy-dense foods such as processed foods and refined grains, and foods with high fat content create challenges for low-income families. Children from low-income families are less likely to consume fruits and vegetables (St John et al, 1998), more likely to eat junk food (Pabayo et al, 2012), more likely to consume sugary drinks, and are less aware of health-related diseases than children from high-income families (Morton & Guthrie, 1997). Other important socio-economic status factors that are known to be risk factors for obesity are age and education. The Public Health Agency of Canada (2011) shows that older individuals are more likely to be obese than their younger counterparts, while individuals with higher education are less likely to be obese than individuals with less education.

Second, geographical location matters and obesity rates in Canada are not equally distributed across the country. For example, The Legislative Assembly of British Columbia (2006) show that child obesity in Newfoundland is more than twice as

prevalent than child obesity in Quebec, Prince Edward Island, Alberta, and British Columbia. Individuals residing in Northern communities are especially prone to becoming obese. For example, a Public Health Agency of Canada report (2011) shows that the obesity rate in Nunavut is 6.8 percent higher than the Canadian average. The same report also shows that rural communities tend to be associated with higher obesity rates than their metropolitan city counterparts. This relationship persists even when controlling for demographic variables such as age and education. Differences in attitudes towards weight and weight loss may explain weight variation between urban and rural residents. Sweet et al (1997) show that urban residents are more likely to be trying to lose weight, suggesting that there is a cultural difference in feelings towards dieting between urban and rural residents

Third, parents play an important role in creating a home environment for children that encourages healthy eating and physical activity. Parents shape their children's dietary pattern and physical activity behaviour by acting as role models. Children who witness their parents' eating healthy foods are more likely to consume healthy foods (Campbell et al, 2006). Conversely, children of parents who eat foods that are high in fat are more likely to eat unhealthy foods (Snethen et al, 2008). Parents are also in a position to educate children about nutrition and the benefits of eating healthily. Children's physical activity levels are also moderated by parental influence. Children who have a parent who participates and supports physical activity are more likely to be physically active themselves (Spruijt-Metz, 2011). Lastly, the amount of television children watch is also moderated by parental influence (Yu, 2011).

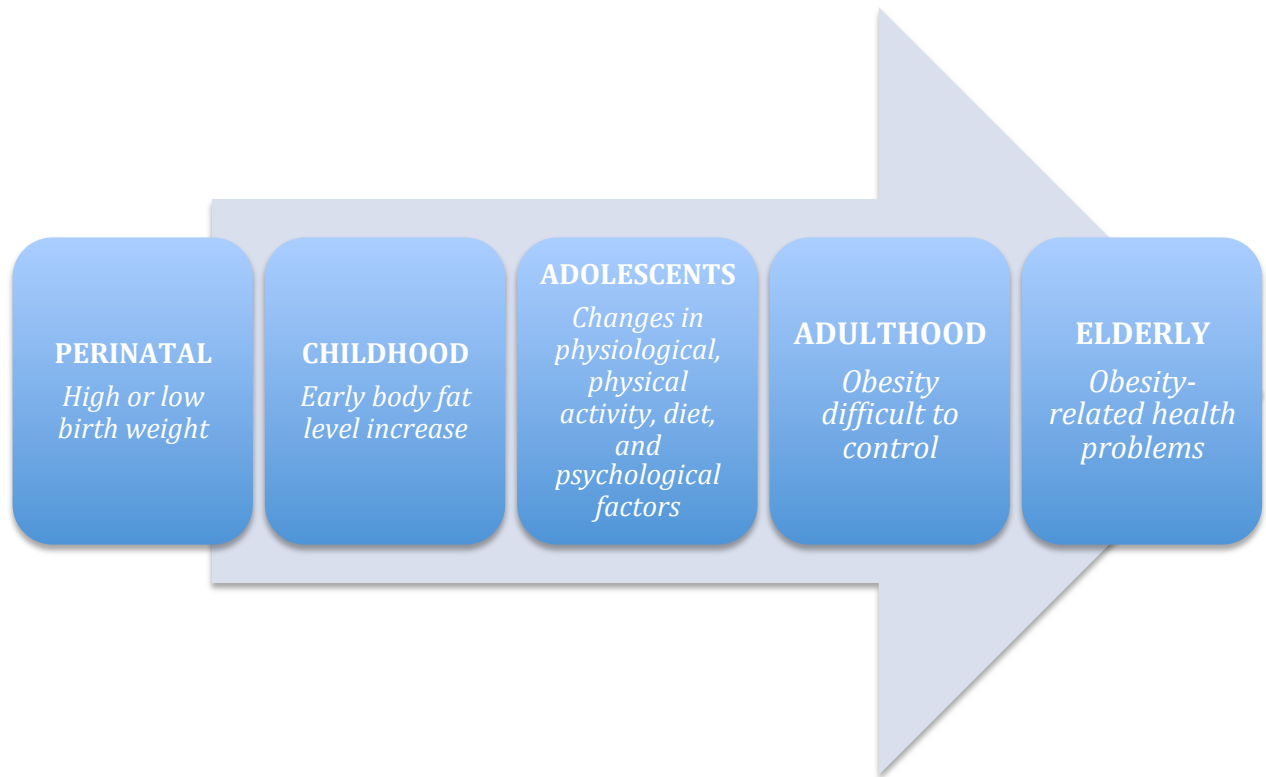
To summarize, genetic, social environment, and behaviour represent risk factors that directly influence the likelihood of becoming obese. There are also risk factors such

as socio-economic status, geographic location, and parental role modelling that indirectly influence obesity prevalence. Among direct risk factors, genetic factors are unmodifiable; however, social environment and behavioural factors can be addressed. The next section examines the development of obesity from an early age and illustrates the importance of early obesity prevention.

Chapter 3. Impact on Children

Child development is linked to adult health status. Early life experiences leave permanent imprints on human beings both physiological and psychological. This is consistent with the life-cycle model (Reese et al, 1984). Obesity, like many other developmental behaviours, has critical sensitive periods during a child's development. Obesity that develops during those periods is more likely to persist into adulthood (Dietz, 1994). The critical periods occur during the perinatal period, infancy (5-7 years-old) and adolescents (13-19 years-old). During the perinatal period, a birth weight higher than 4 kilograms or lower than 2.5 kilograms is associated with obesity prevalence. Encouraging pregnant mothers to maintain a healthy weight is an effective measure to prevent the birth of a child with an unhealthy weight. During the infancy period, adiposity, or body fat, levels, measured by the BMI, decline to a minimum point before rebounding. Adiposity levels that increase premature to the infancy period are associated with obesity prevalence. An unhealthy diet and low physical activity levels can lead to early adiposity rebound. During adolescents, changes in body composition, insulin sensitivity, physical activity levels, diet, and psychological factors contribute to an increased likelihood of developing obesity (Alberga et al, 2011). Figure 1 illustrates the evolving nature of early-life experiences on future obesity-related outcomes. Improving individual's long-term health requires particular emphasis on the critical sensitive periods in an individual's lifetime.

Figure 1: Life-cycle Approach



Source: Soon et al (2008)

The likelihood that obesity will persist into adulthood increases steadily with age (Leibel & Rosenbaum, 1988). An obese child at the age of 6 has a 50 percent chance of being obese in adulthood, while an obese child at the age of 10 has a 70 percent to 80 percent chance of obesity as an adult (American Heart Association, 2011). Before the age of three, the primary indicator of persistent obesity in adulthood is the obesity status of the child's parents (Whittaker et al, 1997). This pattern illustrates the role direct risk factors play in obesity. Before the age of three, genetics are the primary determinants of persistent obesity in adulthood. After the age of three, social environmental and behavioural factors are the primary driving forces behind persistent obesity. Eating habit formation can help explain this trend. When a child is young, eating habits and preferences are malleable; however, as children age, they become increasingly more

rigid (Olsen et al, 2013). Moreover, indirect risk factors such as socio-economic status, geographic location, or parental influence can limit exposure to healthy foods at an early age. Children from low-income families are twice as likely of being obese than their high-income counterparts (Veugelers and Fitzgerald, 2005). Eating habit formation has important policy implications for obesity prevention. Story (1999) highlights the need for policies that encourage healthy eating at an early-age, especially during a child's critical periods of fat growth. Story finds that obesity that persists into adulthood is much more difficult to treat. She suggests that obesity prevention programs tailored to children are more successful than similar programs for adults. School-based obesity prevention programs provide an opportunity to address child obesity.

Chapter 4. Obesity and Academic Performance

In part one of this section, I discuss the relationship between obesity and academic performance. In the latter part of the section, I discuss the theoretical framework that supports addressing obesity through the school system.

4.1. Relationship

Obesity has implications for children that extend beyond poor health. Obese children perform worse academically than their non-obese peers (Ding et al, 2009). Han (2012) ascertains several reasons for the relationship between obesity and poor academic performance: (1) poor work habits, (2) increased absenteeism, (3) behavioural problems, and (4) low educational expectations. First, poor work habits are the most important factor in poor academic outcomes by obese children. Obese children are more likely to see themselves as lazy and are less likely to possess effective studying strategies. Second, obese children are more likely to be absent from school because of an array of health-related medical conditions including diabetes, asthma, joint problems, sleep apnea, and depression (Story et al, 2006). Thirdly, behavioural problems such as being embarrassed to participate in physical activity or bullying may also incline obese children not to want to go to school or behave disruptively. Fourthly, obese children are held to a lower academic standard by their parents, indicating a weight stigma associated with obesity (Han, 2012). Given this relationship between academic

performance and future earnings, rising child obesity rates could lead to greater income inequality.

4.2. Role of Schools

Schools are recognized by the World Health Organization (2008) as a key setting to mitigate or prevent the public health issue of obesity. While schools alone are unlikely to have the capacity to completely eliminate the obesity epidemic, there are good reasons for addressing obesity through schools. First, children spend more time in school than in any other place outside of their homes. Second, many children eat at least one meal per day at school. Third, schools are in a good position to deliver obesity prevention programs because of the resources available at most schools such as school nurses, counsellors, and spaces for physical activity such as gymnasiums, and playgrounds. Fourth, schools have a duty to educate children in academic subjects and social responsibilities that will enable them to reach their full potential. Fifth, health and academic success are not mutually exclusive. Children with poor diet quality do not perform as well in school. Sixth, schools are able to reach students from various ethnic and socio-economic backgrounds. For the above reasons, schools are an ideal environment to address childhood obesity.

Essentially, there are three avenues for schools to treat or prevent obesity, modify the amount of energy input, modify the amount of energy output, or both. In other words, schools can address a child's diet, a child's physical activity level, or both. British Columbia schools currently have a number of programs that aim to address either a child's diet or physical activity level.

Chapter 5. British Columbia

In this section, I discuss the obesity epidemic in British Columbia and the costs associated with it. I also describe school-based initiatives the BC government is currently adopting to address obesity.

5.1. Obesity in British Columbia

British Columbia (BC) leads the country with the lowest obesity rates at 7 percent (Legislative Assembly of BC, 2006). Although obesity prevalence is not as high in BC as in other provinces, the impact of obesity on BC's healthcare system is significant. After cigarette smoking, obesity is the second most preventable, contributing cause of death and approximately 2000 individuals die prematurely due to obesity-related health issues (Kendall, 2010). In 1997, obesity-related illnesses cost the BC healthcare system an estimated \$380 million in direct costs, and an additional 350-\$400 million in indirect costs i.e. lost productivity at work (Kendall, 2010). On a per capita basis, the cost of obesity in BC is nearly \$200.¹

5.2. School Food Availability

The food available to students in BC school varies depending the level of schooling. Rideout et al (2007) show that the majority of elementary schools do not have

¹ Population estimates collected from BC Stats (2013)

permanent onsite cafeterias. The majority of school food found in elementary schools emanates from tuck shops or school fundraisers selling food to students. Moreover, Mâsse and de Niet (2013) show that the majority of primary schools do not have onsite kitchens or cafeterias. Secondary schools, however, do have onsite kitchens, cafeterias, and vending machines. In terms of food coming from outside schools, Rideout et al (2007) show that over 1/3 of students purchase food from an off-campus retailer during the school week.²

5.3. British Columbia Institutions

In Canada, by virtue of the Constitution Act (1867) provincial legislatures have authority over education. Until 1990, BC's education system did not have any programs in place to target childhood obesity. The BC education system's disposition changed shortly after the first international health conference in 1986. The 38 participating nations in the conference, including Canada, agreed to implement public health policies that support and enable people to make healthy life choices (World Health Organization, 1986). The Ottawa Charter was created to guide governments in setting up strategies and programs for health promotion (World Health Organization, 1986). Under the guidance of the Ottawa Charter, BC began introducing programs aimed at encouraging healthy lifestyles in schools. Healthy Schools is one of the earliest health-promoting initiatives in BC. It was implemented in 1990, and provides funding to schools to successfully create school environments that support the healthy development of school children by enhancing personal skills for health (BC Ministry of Children and Family Development, 2003). Since its introduction, the program has evolved into a one-stop

² This study only included Vancouver schools

web-portal aimed at providing tools and resources to support schools and health authorities in designing and implementing healthy school initiatives.

In 2002, Action Schools! BC was introduced as a pilot project in 10 schools. McKay (2004) asserts that Action Schools! BC is designed to help elementary and middle schools in creating and implementing individualized actions plans that promote healthy living and academic excellence. She states that the long-term goal of Action Schools! BC is to cultivate healthy living behaviours in children. To achieve this vision, Action School! BC provides planning recommendations and tools that integrate physical activity, physical education, and healthy eating practices into the school community at large. There are two key focuses of the Action Schools! BC program: a physical activity and a healthy eating component that was added in 2007. For the physical activity component, teachers are given resources, materials, and physical equipment and asked to introduce an additional 15 minutes of physical activity in the classroom per day (Masse et al, 2012). The goal of the healthy eating component is to assist teachers in bringing healthy eating into the classroom by providing teachers with resources and activities (Day et al, 2008). Since its inauguration, Action Schools! BC has held workshops for over 1350 schools and over 600 schools have submitted action plans (Action Schools! BC, 2013). All workshops are attended on a voluntary basis. The results of the program are mixed. It has a modest, but significant impact on the physical activity of boys; however, the program does not appear to influence girl's physical activity levels (Naylor et al, 2008). In terms of healthy eating, Action Schools! BC significantly impacts children's fruit and vegetable consumption and willingness to try new fruits and vegetables (Day et al, 2009). As for impact on BMI, boys in schools participating in Action Schools BC! are less likely to be overweight than boys in other

schools; however, the program does not appear to reduce the prevalence of overweight girls (McKay, 2004).

In 2003, the BC Ministry of Education launched CommunityLINK, a provincial-wide program that provides over \$51 billion in funding to school districts to invest in programs and services that support vulnerable children (BC Ministry of Education, 2013). The BC Ministry of Education (2013) reports that school districts are given complete autonomy on where and how to spend the funding. Funding is based on the number of vulnerable students in the school district. Several measures are used to assess vulnerability including income; involvement with the provincial social service ministries and related agencies; socio-economic status; community mapping information; and other less objective measures including staff observation and self-identification. One of CommunityLINK's aims is to provide food for students in need. A source from the BC Ministry of Education estimates that 26 percent of the program's funding is currently being used to support meal services such as breakfast programs or school lunches.

In 2003, health promotion in BC schools was elevated to new heights when Vancouver won the bid to host the 2010 Winter Olympic Games. Geneau et al (2009) report that the provincial government at the time used the window of opportunity to leave a legacy of BC as one of the healthiest jurisdictions ever to host the Olympic Games. In 2005, ActNow BC was introduced, a whole-of-government strategy to achieve the ultimate goal of changing individual behaviours that lead to chronic illnesses. Geneau et al report that the provincial government at the time transferred \$25 million to the non-governmental organization, the British Columbia Health Living Alliance. According to the authors, numerous school-based health initiatives would be introduced under the auspices of ActNow BC, including the Guidelines for Food & Beverage Sales in BC

Schools (Guidelines), BC Fruits and Vegetable Nutrition Program, Farm to School Salad Bar, and Sip Smart! BC, while other programs such as Action Schools! BC would be scaled up. Although ActNow BC's mandate expired in 2010, these initiatives are still in place in BC schools today,

In 2005, the Guidelines for Food and Beverage Sales in BC Schools (Guidelines) was introduced with the goal of increasing children's access to healthy food options, and providing nutritional standards for the foods and beverages sold in BC schools. The Guidelines outlines minimum nutritional standards for schools to follow, including the outlawed sale of soda pop, candy, potato chips, and other junk foods (BC Ministry of Education and Ministry of Health, 2008). The Guidelines applies to all vending machines, school stores, cafeterias, and fundraising sales in the school setting (BC Ministry of Education and Ministry of Healthy Living and Sport, 2010). In addition to implementing the nutrition standards in the Guidelines, there are a number of optional policies that discourage the use of marketing to children; using food as a reward; and the use of sugar substitutes and water bottles (BC Ministry of Education, 2013). Since 2005, it has undergone several revisions to include stricter nutrient criteria for the consumption of calories, fats, salt, and sugar (BC Ministry of Education, 2010). As of September 2008, all BC public schools are required to implement the Guidelines (BC Ministry of Education, 2010). However, very few schools are adhering to this rule. For example, data from a BC Ministry of Education and Ministry of Health report (2008) shows that 67 percent of reporting schools are still selling prohibited beverages in school vending machines and 92 percent are still selling prohibited snacks in school vending machines. In the government report, many schools cite not having adequate resources (financial or

knowledge) as barriers to fully implement the Guidelines. A second issue with the Guidelines is that it does not cover children who bring unhealthy lunches to school.

In 2005, the BC Fruits and Vegetable Nutrition Program (BCFVNP) was introduced in 10 BC schools as a way of getting children to consume more fruits and vegetables (Naylor and Bridgewater, 2007). Since BCFVNP's inauguration, the program has grown to provide fresh fruits and vegetables to over 525,000 students in 1439 K–12 BC public schools (BC Ministry of Education, 2013). In addition to the health benefits of consuming fresh fruits and vegetables, students also learn that eating local, fresh produce supports local farmers and the community at large (BC Ministry of Education, 2013). The program has received positive feedback from students, teachers, and parent advisory committees (PAC) (Naylor and Bridgewater, 2007). A milk component that provides subsidized milk to schoolchildren K to grade 2 across the province was added to the program in 2013 (BC Ministry of Finance and Ministry of Agriculture, 2013). Despite the BCFVNP's efforts, the program only provides fruits and vegetables to students on a bi-weekly basis. Masse and de Niet (2013) show that on a day-to-day basis, fruits and vegetables are not available in the majority of BC elementary schools. Moreover, although the program is free for schools, schools can be hesitant to register because of the time it takes to administer the program.

In 2008, the Public Health Association of BC setup Farm to School (F2S) Salad Bar programs in 16 schools in aboriginal communities across BC's north and interior using funds from ActNow BC (Bays, 2011). According to Bays (2011), the aim of the program is to increase access to local, healthy foods at an affordable price. He notes that foods are served in the salad bar twice per week at participating schools at a cost of approximately \$3.00 per child, per meal. Since its inauguration, the F2S Salad Bar

program has expanded from 16 to 28 participating schools (Public Health Association of BC, 2013). Bay claims that the program has received positive feedback from participants. All participating schools report that children are consuming more fruits and vegetables as a result of the program. However, Bay also notes the challenges that the F2S Salad Bar program has faced, which include: low participation among secondary schools, and low quality of local food during winter months.

In 2008, Sip Smart! BC was introduced as a pilot project in 230 BC classrooms (BC Pediatric Society, 2010). Sip Smart! BC is an educational program that teaches children from grade 4 to 6 about the nutritional content of sugary beverages and how to make healthier beverage choices (BC Pediatric Society, 2010). Similar to other health-promoting school programs, Sip Smart! BC is encouraged by the BC Ministry of Education to schools, but is not mandatory. The efficacy of Sip Smart! BC program in changing long-term eating and drinking habits is unconvincing. A Public Health Agency of Canada (2012) report shows that although Sip Smart! BC is effective in curtailing children's consumption of sugary beverages in the short-term, it is ineffective in the long run.

Summary

Table 1 summarizes the list of school nutrition programs in BC.

Table 1: School Nutrition Programs in BC

| Program | Year Introduced | Description | Range |
|---|------------------------|--|--|
| Healthy Schools | 1990 | Provides funding to schools to develop ways to successfully create school environments that support the healthy development of school children by enhancing personal skills for health | Currently, a one-stop web portal for schools and health authorities |
| Action Schools! BC | 2002 | Designed to help elementary and middle schools in creating and implementing individualized actions plans that promote healthy living and academic excellence under a comprehensive school health framework | Over 1350 BC schools have participated in an Action Schools! BC workshop Over 600 schools have submitted Action Plans |
| Community Link | 2003 | Provides funding to school districts to invest in programs and services that support vulnerable children | 60 school board districts in BC |
| Guidelines for Food & Beverage Sales in BC Schools (Guidelines) | 2005 | Outlines minimum nutritional standards for schools to follow | As of September 2008, all public schools in BC are required to implement Guidelines |
| BC Fruits and Vegetable Nutrition Program | 2005 | Provide fresh fruits and vegetables on a biweekly basis | 525,000 students in 1439 K–12 BC public schools |
| Farm to School Salad Bar | 2005 | Increase consumption of healthy foods among children in schools where access to such foods is limited | 28 participating BC schools, primarily in the North and Interior of the province |
| Sip Smart! BC | 2008 | Educate children about the harmful health effects of sugary beverages | Grade 4, 5, and 6 BC school children |
| School Milk BC | 2013 | Provides subsidized milk to children | BC Schoolchildren in grades K to 2 |

Although it is difficult to assert causation, the build-up of school nutrition programs in BC to address children’s diet and physically activity levels have assisted in the recent stagnation in the prevalence of children with unhealthy weights in the province. BC’s child obesity rate has not increased in a decade. However, there is no indication that child obesity level is returning to the one experienced in the late 1970’s.

This suggests more assertive action is required. Despite the multitude of school nutrition programs currently in BC schools, problems exist with school compliance, range, and the general efficacy of these programs.

Chapter 6. Policy Problem and Stakeholders

My policy problem is: Despite the efforts by the BC government, many children in BC schools still do not consume a healthy diet. The consequences of not consuming a healthy diet in early childhood can be significant. First, children with poor diets perform less well academically at school. Poor diets place children at an academic disadvantage and can impede them from reaching their full academic potential. Second, early life experiences embed habits and preferences in children that can impact them later in life. Poor eating habits that are formed during childhood often continue into adulthood. Poor diet is contributing to the rising obesity rates in Canada. Obesity costs the BC economy an estimated \$730 to \$780 million every year. Schools are internationally recognized as an ideal environment to address the obesity epidemic for several reasons: children spend more time in school than in any other place outside of their homes; many children eat at least one meal per day at school; schools are already equipped with many of the necessary resources to address obesity; schools have an obligation to ensure children reach their full potential; and schools are able to reach students from various ethnic and socio-economic backgrounds. This study aims to ascertain what school nutrition programs need to be developed or redeveloped in BC to improve the health and well-being of BC schoolchildren.

The major stakeholders are: BC families, and schools. BC families are broken down into 3 subcategories: school children, parents, and parent advisory committees (PAC). BC school children will be the most directly impacted by the changes in school

nutrition policy. Their parents are also major stakeholders as they have a vested interest in their child's health. PACs are also major stakeholders because they advise the school principal and staff on matters relating to school. Schools are major stakeholders because healthy children perform better academically (Florence et al, 2008). Improved academic performance could result in fewer children repeating grade years, which would place less of a burden on schools.

The minor stakeholders are private catering companies, taxpayers, and local farmers. Private catering companies could experience more or less business depending on the change in school nutrition policy. Taxpayers are also minor stakeholders as they could experience a short-term increase in taxes as a result of the change in school policies. All residents in BC pay a school tax, regardless of whether or not their families use the education system. School taxes cover approximately 32 percent of the total cost of education in BC (B.C. Home, 2013). Local farmers are minor stakeholders because recent changes in other jurisdictions' school nutrition policies have seen a stronger emphasis on the procurement of local foods (Gillie and Long, 2011). This being the case in BC, we could expect more business for local farmers.

Chapter 7. Methodology

This section outlines the methodology used to derive the policy options. The goal in this study is to ascertain the most effective criteria for improving the health and well-being of children through the education system. The primary methodology is comparative analysis using case studies³, while the secondary methodology assesses the importance of each criterion through the examination of academic literature.

First, the case study analysis compares each jurisdiction's school nutrition policies/programs ability to address the Comprehensive School Health (CSH) framework. In this sense, the purpose behind the case study analysis is both exploratory and comparative (Yamaguchi, 1991).⁴ The three case studies selected for investigation are: the Annapolis Valley Health Promoting Schools (AVHPS) initiative in Nova Scotia, Singapore, and England. The jurisdictions are selected based on the following criteria: economically developed region or country; similar average class sizes to BC schools; a school nutrition program implemented in a large-scale in the sense that it applies to an entire school district or larger geographical region; and an effective program in reducing child obesity rates. Comparisons of the criteria are provided in Table 2. The rationale for selecting AVHPS for a case study is it is a school board located in Nova Scotia, Canada,

³ Throughout this study, I refer to comparative analysis of case studies as simply "case study analysis".

⁴ Exploratory case study analysis attempts to gain an understanding of why a decision was made; how the decision was implemented; and what were the results of the decision.

and therefore has a similar education system as BC.⁵ Singapore and England are selected to provide international context and experience with regards to school nutrition policies and, both jurisdictions have well-developed education systems. The shortcoming of selecting international jurisdictions is that the cultural norms, attitudes, and beliefs towards diet and exercise may be different than in BC. The extent of these differences and subsequent impact on diet and exercise are beyond the scope of this study.

Table 2: Case Study Analysis

| | Education System Style | Average Class Sizes | Beginning of School Nutrition Policy | School Nutrition Policy Range | Effectiveness |
|------------------|-------------------------------|----------------------------|---|--------------------------------------|---|
| AVHPS | Public | 21-26 students | 1997 | All students | <ul style="list-style-type: none"> • Students of the AVHPS project schools are 72% less likely to be obese |
| Singapore | Public | 33 students | 1992 | All students | <ul style="list-style-type: none"> • 4% decrease in obesity rate |
| England | Public | 21-27 students | 2006 | All students | <ul style="list-style-type: none"> • 31% decrease in obesity for children aged 2-10 • No change for children aged 11-15 |

Sources: AVRSB (2010); Wößmann and West (2002); UK Department for Education (2011); University of Alberta (2011); Gupta et al (2010); Public Health England (2013)

⁵ Although AVHPSs represent only a small number of schools in a rural area in Nova Scotia, the model has been applied in other jurisdictions across Canada and its effectiveness has been proven to be transferable (Fung et al, 2012).

Table 2 shows that school nutrition policies are less than 25 years old in all three case studies. The education systems in all three cases are public, meaning that funding emanates from government, rather than private sources. The average class size in two of the case studies, AVHPS and England, is very similar, whereas in Singapore class sizes are larger.⁶ In all the case studies, the school nutrition policies are a population health approach, meaning that the policies aim to improve the health of the entire student population. Finally, all three case studies have experienced a decline in child obesity rates. In AVHPSs, students are 72 percent less likely to be obese than students attending non-AVHPSs in Nova Scotia. In Singapore, child obesity rates decreased from 14 percent in 1992 to 10 percent in 2000. In England, obesity among children 2 to 10 year old dropped by 31 percent following the legislation of school nutrition standards. The fact that the school nutrition policy has had no impact on older children exemplifies the importance of cultivating healthy eating habits in children at an early age.

All my case studies will focus on the history of school nutrition policy and programmes currently being offered by each government. Programmes funded exclusively by non-government institutions or charities are not considered.

7.1. Evaluation Framework

Case studies are assessed based on their ability to address the CSH framework. CSH is an adaptation of the World Health Organization's (WHO) Health Promoting School principles (World Health Organization, 1998). The Health Promoting School

⁶ In AVHPSs, the average class size in primary schools is 23 students and in secondary schools is 24 students. In England schools, the average class size in primary schools is 27 students and in secondary schools is 21 students. Information could not be gathered on the dichotomy of average class sizes in Singaporean primary and secondary schools.

principles are meant to serve as a framework for governments, schools, and nongovernmental organizations to support health and well-being of school children. There are four inter-related guiding principles: (1) social and physical environment, (2) teaching and learning, (3) healthy school policy, and (4) community partnerships and services. Table 3 summarises the framework of analysis and shows the measures to identify the characteristics of school nutrition. It is also important to note that the criteria I use to assess the health promoting school principles are not directly mentioned in the WHO model, but are rather formulated for the purpose of this study to capture the spirit of the principles.

First, social and physical environment principle encompasses having a positive school environment that encourages learning. I have excluded the social and physical environment principle from the analysis for the following reasons: The WHO encourages all countries, regardless if the country is developing or developed, to adopt its health promoting school framework. Most schools in developed countries already include things such as a physical building for the school, a playground, a gymnasium, and basic amenities such as sanitation and cleanliness. For this reason, I have excluded the social and physical environment principle. Any difference in the health outcomes of children in the case study analysis is most likely not the result of a factor relating to the school's social and physical environment.

Second, the teaching and learning principle is represented by any resources, activities, workshops, training sessions, etc., for school children and school staff that help them build the skills necessary to improve their health and well-being. The criteria I use to assess teaching and learning are: health service training for school staff, physical education training for school staff, training for food service staff, health education for

children K to 12, and physical education training for children K to 12. Health service and physical education training for school staff is measured by any workshop, lecture, or training seminar that school staff would have received as a result of the introduction of the school nutrition program. Training for food service staff is measured by any workshop, lecture, or training seminar that food service staff would have received as a result of the introduction of the school nutrition program. Health education for children is measured by the presence of health education in the school's curriculum for students throughout grades K to 12. The physical education (PE) for children criterion is measured by having a physical education curriculum for school children from grades K to 12 that meets the WHO's recommendations of 60 minutes of moderate to vigorous physical activity per day (World Health Organization, 2010).

Third, healthy school policy is a broad-term that can encompass many different facets of management-practices, regulations, and policies within a school that relate to student health. To narrow the range of what is meant by healthy school policy, I narrow it down to nutritional services. The criteria I use to assess nutritional services include: nutritional standards, access to healthy food options, and food service programs. The nutritional standards criterion is measured by the existence of nutritional guidelines that regulate food and beverages sold at schools. The access to healthy food options criterion is measured by the availability and affordability of healthy foods and beverages for students at school. The foodservice programs criterion is measured by the presence of breakfast, lunch, and snack programs at school.

Fourth, the community partnerships and services principle is demonstrated by a supportive relationship between the school, parents, and community. The criteria I use to assess partnerships and services include: parental involvement with the school nutrition

program, teacher involvement with the school nutrition program, and the school's relationship with the community. Parental involvement with school nutrition program is measured by whether or not parents were consulted during the planning of the nutrition program, and efforts to inform and include parents throughout the school year on an ongoing basis. Examples of efforts to include parents are: workshops, information sessions, newsletters, websites, and school events that encourage parents to participate. Similar to parental involvement, teacher involvement with school nutrition program is measured by whether or not teachers were consulted during the planning of the nutrition program, and efforts to inform and include teachers throughout the school year on an ongoing basis. Examples of efforts to include teachers are: workshops, information sessions, classroom activities, and school events that encourage teachers to participate. The quality relationship with the community criterion is measured by: community involvement with the school nutrition program, school access to community facilities, community access to school facilities, and third-party (health professional, sports professional) involvement.

In addition to the CSH principles, I add an additional criterion: implementation. Implementation is important because any policy can ultimately fail to achieve its objectives if the policy is not judiciously implemented. The criteria I use to assess implementation are the nature of the implementation of the school nutrition policy, and of government support. Nature of implementation is measured by whether the policy was compulsory, voluntary, or incentive-based. Government support is measured by whether government subsidies or other government tools are used to support the school nutrition policy.

The next chapter examines the school nutrition policy in each case study.

Table 3: Evaluation Framework

| CSH Principle | Criteria | Measure |
|--|---|---|
| Teaching and Learning | <ul style="list-style-type: none"> • Health service training for staff • Physical education training for staff • Training for food service staff | <ul style="list-style-type: none"> • Are there workshops, training seminars, and/or lectures available for staff? • Are the lessons available one time only or on an ongoing basis? • Are the lessons compulsory or voluntary? |
| | <ul style="list-style-type: none"> • Health education for children (K-12) | <ul style="list-style-type: none"> • Is there a health education component embedded in the school curriculum? • Is there a practical component to the health education curriculum? |
| | <ul style="list-style-type: none"> • Physical education for children (K-12) meets physical activity recommendations | <ul style="list-style-type: none"> • Does the physical education curriculum meet the WHO's physical activity recommendations? |
| Nutritional Services | <ul style="list-style-type: none"> • Nutritional standards | <ul style="list-style-type: none"> • Is there a Guideline for food and drinks sold at schools? |
| | <ul style="list-style-type: none"> • Access to healthy food options | <ul style="list-style-type: none"> • Are healthy food options available and affordable? |
| | <ul style="list-style-type: none"> • Food service programs | <ul style="list-style-type: none"> • Is there a breakfast program? • Is there a school lunch program • Is there a snack program? |
| Community Partnerships and Services | <ul style="list-style-type: none"> • Parental involvement • Teacher Involvement | <ul style="list-style-type: none"> • Were parents/teachers consulted in the planning of the program? • Is information available to parents/teachers about school nutrition? • Are workshops, information seminars, etc.. made available to parents/teachers? Are they ongoing or one-time only? |
| | <ul style="list-style-type: none"> • Quality relationship with community | <ul style="list-style-type: none"> • Is the community involved? Ex. Newsletters • Does the community have access to school facilities after school hours? • Does the school have access to community facilities? • Are 3rd parties (health, sports professionals) involved with school nutrition? |
| Implementation | <ul style="list-style-type: none"> • Nature of Implementation • Government support | <ul style="list-style-type: none"> • How was the program implemented? Was it voluntary, compulsory, or incentive-based? • Does the government offer support in the form of subsidies and/or other tools for schools to support school nutrition policy? |

Chapter 8. Case Studies

In this section, I describe the school nutrition policy in the three selected case studies: Annapolis Valley Health Promoting Schools (Nova Scotia), Singapore, and England. Each sub-section outlines how each case study addresses the teaching and learning, nutritional services, partnerships and services principles of the CSH framework, and the supplementary implementation component. From the analysis, I identify the criteria missing from BC's school nutrition policy, and then examine those missing criteria further. The summary of the results are in Table 4 at the end of the chapter.⁷

Sources

The sources of the data for ANVHPSs are: Annapolis Valley Regional School Board (2006/2013); Teacher Association for Physical and Health Education (2013); University of Alberta (2011); Nova Scotia Department of Education (2006); and Ohinmaa et al. (2011). For Singapore schools the sources are: O'Dea and Eriksen (2010); Singapore Ministry of Education (2010/2013/2014); Foo and Ling (2013); Health Promotion Board (2013); Lee (2003); and Soon et al (2008). Finally, for England the sources are: Gillie and Long (2011); Department for Education (2013); School Food Trust (2007); Children's Food Trust (2014); Nelson (2012); and Sport England (2013).

⁷ See Appendix A for a more detailed summary of the case study analysis.

8.1. Annapolis Valley Health Promoting Schools (Nova Scotia, Canada)

The Annapolis Valley Health Promoting Schools (AVHPS) is an initiative first introduced as a 2 ½ year pilot project in 8 primary and secondary schools. Funding for the pilot project was provided by the Public Health Agency of Canada. The AVHPS is an all-inclusive project meaning that all those affected by the initiative, i.e., students, teachers, parents, and the community at large, are involved in the planning and implementation of the project. The AVHPS initiative aims to make healthy eating and physical activity choices easier for students to make. Some of the AVHPS-supported programs at schools include: redesigning the menu at schools to include more healthy foods that students indicated that they like, universal breakfast program, school gardens, increased physical activity opportunities before and after school, at recess and lunch, professional development for staff, family inclusion and health education, increased access to school and community facilities before, during, and after school, and breaking down barriers to physical activity such as transportation. The results of the AVHPS pilot project were compelling enough to convince the Nova Scotia government to make AVHPS initiative a provincial program.

8.1.1. *Teaching and Learning*

In terms of training, school staff do not receive additional health and physical training opportunities. That being said, food service staff receive training and support to help facilitate knowledge about the school nutrition program. Food service staff are also involved in designing the school menu to ensure that it meets the nutrition needs of students and the school nutrition guidelines.

A new health curriculum was setup in AVHPSs to achieve the program's health-related objectives. The new health curriculum is taught to all children attending a AVHPS. In addition to learning about health concepts in class, many AVHPSs have school gardens to help students gain valuable hands-on experience with growing and nurturing produce.

In terms of physical education (PE), all Nova Scotia schools allocate between 100 to 150 minutes per school week, depending on the school grade, to physical exercise. Although this falls short of the WHO's recommendation, the AVHPS program goes beyond the standard PE curriculum. This is accomplished in several ways: planned family physical activity events after school, allowing students to take-out school sport equipment after school hours, encouraging students to walk to school, and by giving students physical education homework (i.e. logging extra physical activity time at home).

8.1.2. Nutritional Services

In AVHPSs, nutritional guidelines are based upon the Food and Beverage Standards for Nova Scotia Public Schools. The nutritional standards group food and beverages into three categories: maximum, moderate, and minimum nutrition. Food and beverages that fall under the minimum nutrition category (very high sugar, fat, salt, caffeine, artificial sweeteners, and/or processing) can only be sold at schools once or twice per month at special functions. All schools in the AVHPS project were required to implement the provincial standards for school food and beverages.

AVHPSs' school nutrition program is driven under the motto "making the healthy choice the easy choice" (Annapolis Valley Health Promoting Schools, 2006, p.1). Schools in the program applied for grants, conducted fundraisers, and received financial

support from community partners to help lower the costs of healthy food options for students.

In terms of food service programs, AVHPSs offer a universal breakfast program to all students, and a farm to school fruit and vegetable program that delivers fresh, local produce to selected schools on a monthly basis. Schools do not offer a school lunch program to students.

8.1.3. *Partnerships and Services*

Parents and teachers were involved during the planning and implementation of the school nutrition program in AVHPSs through a number of channels, which include: information sessions, workshops, participation in school events and activities, surveys, nutrition committees, and newsletters. Additionally, teachers are encouraged to be engaged with the school nutrition program throughout the school year by giving their students extra opportunities to be physically active outside of the classroom.

In terms of quality relationship with the community, the fourth mandate of the AVHPS project is creating links with schools and communities. AVHPSs hold workshops to educate members of the community about the project, and keep the community informed about initiatives through school newsletters and the media. School facilities are made available to community agencies that are offering physical activity programs, and conversely, schools use community facilities to expand the number of physical activity opportunities available to students. A project advisory committee consisting of members from the education, sports and recreation, health, food industry, and research is established at the onset of the project to achieve the program's health objectives.

8.1.4. Implementation

The AVHPS program is a test pilot project, and it is therefore compulsory for all participating schools. For Nova Scotia schools that are implementing the program post the test pilot project, the program is voluntary. In terms of government support, AVHPSs receive funding from the government to be allocated for breakfast programs and school food policy.

8.2. Singapore

In Singapore, the Trim and Fit (TAF) program is an initiative introduced by the Singaporean national government in 1992 in response to the growing obesity epidemic. The program aims to reduce obesity in children by improving physical fitness and healthy eating among children from grades K to 12. The TAF program is a population-based approach that incorporates the entire student body. In 2007, the Holistic Health Framework (HHF) replaced the TAF program to include broader concepts of students' health, well-being, and healthy life-styles. Several other initiatives have been launched by the Ministry of Education with the aim of improving children's eating habits and physical activity levels, including: The CHERISH (Championing Efforts Resulting in Improved School Health) awards, and the Health Promoting School Canteen (HPSC) Program.

8.2.1. Teaching and Learning

Schools do not offer additional health and physical education training for staff. In terms of training for food service staff, tuck-shop vendors receive culinary training as part of the HPSC program. The purpose of the culinary training is to help inform tuck-

shop vendors on how to create meals that meet school nutrition standards and that children want to eat.

Health education is taught to students at all levels, while the health curriculum emphasizes making a connection for students between healthy lifestyle concepts and practical applications.

Time allocated to PE was increased in 2010 from 1.5 hours to 2 hours per week for primary grades 1 and 2 (plus 2 hours of activities that incorporate some elements of physical activity), from 1.5 to 2.5 hours per week for primary grades 3 to 6, and from 1.5 hours to 2 hours per week for secondary grade students. Other than primary grade students 1 and 2, PE curriculum falls short of the WHO's physical activity recommendations. However, the HHF program expands beyond the national PE curriculum by encouraging physical activity among all students. This is accomplished through several ways: increasing the opportunities to be active before school, during recess, and after school, increasing the variety of physical activities at school, and working closely with parents.

8.2.2. *Nutritional Services*

The HPSC Program sets guidelines for schools on the types of food and drinks that can be served and the required proportions for school meals. A School Canteen Committee is also set up to ensure that school's continue to adhere to the HPSC guidelines. In terms of access to healthy foods, unhealthy foods are made less accessible through the HPSC guidelines, but healthy foods are not made more affordable for children. Schools offer a free breakfast program to students in financial need, but schools do not offer a lunch or snack program.

8.2.3. Partnerships and Services

Schools offer workshops and culinary training to parents. There are also ongoing outreach efforts to parents to complement the school nutrition program's health objectives. Teachers also receive training sessions on how to effectively implement the school nutrition program. In terms of relationship with the community, Singapore schools offer health education programs that are targeted towards a range of individuals. To help encourage community participation, these health education programs are conducted in community settings. There is no evidence of the community having access to school facilities. There is, however, evidence of schools making efforts to include third-party professionals. Overweight children who are at high risk of developing medical problems are referred to paediatric specialists for treatment.

8.2.4. Implementation

The school nutrition program is not compulsory in Singapore schools; however, the Health Promotion Board, the government body in charge of healthy living and disease prevention, incentivizes schools to participate in the program. The CHERISH awards are awarded to schools that demonstrate the WHO's Health Promoting School principles. To date, approximately 80 percent of schools have been awarded the CHERISH award. To further complement the CHERISH awards, the Health Promotion Board offers schools a grant of up to a total of SGD\$5000 (approximately US\$3660) to use towards any health promotion initiative. In terms of government support, although the government does offer cash awards to schools that are making health-promoting efforts, there is no evidence of the Singaporean government offering upfront grants or subsidies to schools.

8.3. England

In 2006, there were significant changes to nutrition policies in England schools. In response to growing public concerns over the quality of food in public schools that emanated from celebrity chef Jamie Oliver's television show highlighting the dismal state of school lunches, the British government legislated strict nutritional standards for food served at British public schools. School nutrition standards apply to all local authority maintained primary, secondary, special and boarding schools and pupil referral units. Independent schools and academies are exempt from following the standards, but are encouraged. Additionally, the national government established a School Food Trust, a six-year grant worth a total of 480 million euros. The purpose of the School Food Trust was to help subsidize the costs imposed on schools in meeting the new school nutrition standards.

8.3.1. *Teaching and Learning*

England schools do not offer any additional health and physical education training for school staff. In terms of training for food service staff, school-catering staff receives training intended to provide them with the skills necessary to prepare foods that meet the new school lunch nutritional standards.

In terms of health education for children K to 12, health education is a non-statutory subject at the primary school level. Each primary school is given the flexibility to adopt their own health education curriculum to meet the needs of their students. The U.K. Department for Education only provides funding for primary schools to help them develop their own curriculums. Schools do provide opportunities for students to learn

practical skills. The School Food Trust provides funding to schools to develop a cookery class for children in secondary schools.

There is also no national PE curriculum at the secondary school level. Schools are given the flexibility to develop their own curriculum that matches the needs of their students. Schools are only given guidelines as to what students should be taught.

8.3.2. *Nutritional Services*

England schools have legislated requirements for food and beverages that are provided at schools. These legislated school nutrition standards prohibit the sale of confectionary, unhealthy snacks, cakes, biscuits, sugary beverages, and limits the sale of deep-fried foods and processed foods. The Office for Standards in Education (Ofsted), the official, independent school inspection body, regularly conducts inspections to ensure schools are adhering to the legislated school food and beverage regulations. In terms of access to healthy food, schools receive funding from the national government to help lower the cost of healthy ingredients in school lunches. School lunch and breakfast programs are free for students in financial need. The range of free school lunch recipients is slated to expand. Starting in 2014, all students eight years old and younger will receive a free school lunch. A school milk program that provides free milk for children under 5 and subsidized milk for children 5 to 11 years old is also available.

8.3.3. *Partnerships and Services*

Parents were informed and educated about the new school nutrition guidelines at the onset of the program. However, there is no evidence of continuous efforts made by schools to include and inform parents about the school nutrition program. There is no

evidence of teacher involvement during the implementation of the school nutrition program or on a continuous basis. The community is given access to school facilities after school hours for a variety of purposes such as play/recreation, special interest clubs, sports, and study support, to name only a few. No other community link efforts were identified in the analysis.

8.3.4. Implementation

The school nutrition policy in England schools is compulsory. The government legislated strict nutritional regulations for all primary, secondary, and special schools and contracted out monitoring duties to Ofsted to ensure that schools are complying with the nutritional regulations. In terms of government support, schools receive funding from the government as part of the School Food Trust to help subsidize healthier ingredients, purchase new kitchen equipment, train kitchen staff, and offer cooking classes for children.

8.4. Case Study Analysis Summary

Table 4 provides a summary of the analysis. All three case studies demonstrate criteria of a health promoting school. Under the CSH principle teaching and learning, all three case studies provide culinary training to food service staff, and teach health education to students (both theoretical and practical). Both AVHPSs and Singapore schools offer opportunities for physical education that exceed the curriculum standards and that potentially meet the WHO's recommendations for physical activity.

Under the CSH principle, nutritional services, all three case studies have minimum school nutrition standards, and in two of the case studies a committee is in

place to ensure adherence to the standards. Food service programs vary. All three case studies offer some form of breakfast program for students. Both AVHPSs and England schools offer a school snack program.

Under the CSH principle, community partnerships and services, all three case studies informed parents of the changes to the school nutrition policy at the onset of the school nutrition program. In AVHPSs and Singapore schools, there are also ongoing resources made available to parents to encourage their continuous participation in the program. Both AVHPSs and Singapore schools consulted with teachers during the implementation of the school nutrition program. Quality relationship with the community predicated AVHPSs, as the program demonstrates all four of the quality relationship with the community criteria. It also plays an important role in Singapore's school nutrition program. Both AVHPSs and England schools have made it compulsory for schools to comply with the school nutrition program. Government financial-support helped lower the costs of implementing the new school lunch program in both of these case studies.

The implication of identifying the common features of a health promoting school is significant. The common features are potentially indispensable criteria for a CSH framework. Before analyzing these potentially indispensable criteria further, I assess whether BC's school nutrition policy demonstrates any of the common CSH features.

Table 4: Case Study Analysis Summary

| CSH Principle | Criteria | Nova Scotia | Singapore | England |
|-------------------------------------|--|-------------|-----------------|------------|
| Teaching and Learning | Health service training for staff | ✘ | ✘ | ✘ |
| | Physical education training for staff | ✘ | ✘ | ✘ |
| | Training for food service staff | ✓ | ✓ | ✓ |
| | Health education for children: Theoretical | ✓ | ✓ | ✓ |
| | Practical | ✓ | ✓ | ✓ |
| | Physical education for children | ✓ | ✓ | ✘ |
| Nutritional Services | Nutritional standards | ✓ | ✓ | ✓ |
| | Access to Healthy Food | ✓ | ✘ | ✓ |
| | Food service programs: Breakfast | ✓ | ✓ | ✓ |
| | Lunch Fruit and Vegetable | ✘ ✓ | ✘ ✘ | ✓ ✓ |
| Community Partnerships and Services | Parental involvement | ✓ | ✓ | ✓ |
| | Teacher Involvement | ✓ | ✓ | ? |
| | Quality relationship with community: | 1. ✓ | 1. ✘ | 1. ✘ |
| | Community involvement | 2. ✓ | 2. ✓ | 2. ✘ |
| | School access to facilities within the community | 3. ✓ | 3. ✘ | 3. ✓ |
| | Community access to school facilities 3rd party involvement | 4. ✓ | 4. ✓ | 4. ✘ |
| Implementation | Compulsory, voluntary, incentive-based | Compulsory | Incentive-based | Compulsory |
| | Government-support | ✓ | ✘ | ✓ |

8.5. BC and Common CSH Features

By comparing BC's school nutrition policy to these criteria we can gauge how well BC schools are doing in promoting healthy lifestyles in children. The common CSH features selected for examination are: training for food service staff, health education for children (theoretical and practical), physical education for children, nutritional standards, a breakfast and school snack program, access to healthy food, parental involvement, teacher involvement, quality relationship with the community, compulsory nutrition standards for school food, and government support. The rationale for examining only selected CSH characteristics rather than all of the CSH characteristics is to ignore the redundancy of assessing idiosyncratic criteria that are not demonstrated in other health promoting schools. Table 5 shows the CSH features that are common in the three case studies and compares them to BC's school nutrition policy.⁸

⁸ See Appendix B for a more detailed summary of the analysis

Table 5: BC and CSH Common Features Summary

| CSH Principle | Criteria | BC |
|--|--|--------------|
| Teaching and Learning | Training for food service staff | ✘ |
| | Health education for children: 1. Theoretical 2. Practical | 1. ✓ 2. ✓ |
| | Physical education for children | ✓ |
| Nutritional Services | Nutritional standards | ✘ |
| | Food Service Program: 1. Breakfast 2. Snack | 1. ✓ 2. ✓ |
| | Access to healthy food | ✘ |
| Community Partnerships and Services | Parental Involvement | ✓ |
| | Teacher Involvement | ✓ |
| | Quality relationship with community: | ✓ |
| Implementation | Compulsory | Voluntary |
| | Government Support | ✓ |

Sources: BC Ministry of Education (2006/2010/2011); McKay (2004); Dietitians of Canada (2007)

First, under teaching and learning, BC schools do not provide training for food service staff. In terms of health education for children, BC has a curriculum that educates children about health from as early as kindergarten. Moreover, many schools in BC are beginning to introduce school gardens as a means to give children hands on experience, and to introduce children to a variety of local fruits and vegetables. BC schools are also required to provide children up to Grade 7 with at least 30 minutes of physical activity per day. Children in Grades 8 and higher are required to engage in 150 minutes of physical activity per week at school. The allotted time for PE falls short of the WHO's recommendation of 60 minutes of physical activity per day; however, the Action

Schools! BC program increases the number of opportunities for students to be physically active.

Second, for nutritional services, although the BC government introduced nutritional guidelines for food and beverages sold at schools in 2006, few schools are complying with the new nutritional guidelines. Moreover, unlike other successful school nutrition policies, BC does not have a committee in place to ensure that schools are complying with school nutrition standards. In terms of food service programs, some BC schools do offer free breakfast programs. However, breakfast programs are not universal in BC schools. BC schools also offer a fruit and vegetable program and school milk program. Some BC schools also subsidize the cost of school meal programs, or healthy foods; however, the majority of BC schools do not lower the cost of healthy foods for students.

Third, for community partnerships and services, the Action Schools! BC model encourages the involvement of parents, teachers, and the broader community through a variety of activities in and outside of the school grounds. Teams consisting of parents, teachers, and community practitioners are also formed in each school to implement and sustain the health promoting goals of the school nutrition program. Community nutritionists also supported schools during the implementation of the Guidelines.

Fourth, in terms of the implementation, most of the school nutrition programs in BC, with the exception of the Guidelines⁹, are voluntary. Schools are not required to participate in the programs if they do not wish to. Despite the voluntary nature of the programs, both the Action Schools! BC program and BC Fruits and Vegetables Nutrition

⁹ Although very few BC schools are complying with the mandatory Guidelines

program have experienced high uptake from schools, with 84 percent and 90 percent participation rates for each respective program. As for government support, there is some government funding to help support school nutrition programs through the CommunityLINK program.

In summary, although BC schools demonstrate many of the common features of a health promoting school, a number of potentially indispensable criteria do not exist in BC's school nutrition policy. These missing criteria are: training for food service staff, nutritional standards, and access to healthy foods.

8.6. Secondary Methodology

This section aims to support the findings from the case study analysis regarding school nutrition programs. Academic articles are used to assess whether the common features in the case studies are indispensable criteria for a successful health promoting school. The three criteria currently missing from BC's school nutrition policy are selected for examination: training for food service staff, nutritional standards, and access to healthy foods.

8.6.1. *Training for Food Service Staff*

Training for food service staff provides them with the knowledge and skills to deliver healthy foods. Often when considering a whole school approach to improving dietary habits among students, food service staff are overlooked. However, Cho and Nadow (2004) suggest that lack of support and training for food service staff can be a barrier to implementing a successful school nutrition policy. Kimberlee et al (2013) examines the impact a training and professional development programme for school

kitchen staff in the United Kingdom on a number of factors, including: professional skills, staff development, encouraging school meal uptake, and job satisfaction. The study finds that the training programme had a positive impact on school kitchen staff's knowledge, job satisfaction, partnership networking, and co-operation with stakeholders. In terms of impact on knowledge, school kitchen staff knew more healthy recipes as a result of the programme. Although this study does not directly look at the impact of training for food service staff on schoolchildren's health, the study nevertheless demonstrates the importance of food service staff in delivering the goals of a health promoting school.¹⁰

8.6.2. Nutritional Standards

Nutritional standards set limits on the calories, salt, sugar, and fat for food and beverages sold at all school locations and events. This includes food and beverages sold in school cafeterias or tuck-shops, school stores, vending machines, and fundraisers. Nutritional standards are an effective tool in promoting healthy dietary habits among school children. Woodward-Lopez et al (2010) assessed the impact of recent legislated nutrition standards for California schools on students' nutritional intake. The researchers find that school nutritional standards induce positive changes in the school food environment and student dietary behaviours. Following implementation of the nutritional standards, intake of healthy foods increased, while intake of unhealthy food decreased among students. The World Health Organization (2008), Centers for Disease Control and Prevention (2011), and Dietitians of Canada (2013) all support school nutrition standards.

¹⁰ No study to this researcher's knowledge has examined the relationship between training for food service staff and schoolchildren's health.

8.6.3. Access to Healthy Foods

Children must have access to affordable, healthy food at school. Competitive pricing is one method for increasing access to healthy foods. Competitive pricing refers to two types of price modification: lowering the cost of healthy foods, and raising the cost of unhealthy foods. In terms of lowering the cost of healthy foods, French et al (2003) show that a 50 percent reduction in the price of fresh fruit at school results in a four-fold increase in fresh fruit sales. This finding is consistent with other studies on the effectiveness of subsidizing the cost on healthy foods on consumption behaviours (An, 2013). As for raising the cost of unhealthy foods, the evidence is not as clear. Fletcher et al (2010) find that children from states with a soft drink tax consume slightly more calories from soda than states without a tax. Although this finding is not specific to schools, it is telling of the little consumer response to taxes on unhealthy foods.

In summary, training for food service staff, nutritional standards, and access to healthy foods should be considered as alternatives by BC. Although training for food service staff has not been proven to reduce child obesity rates, food service staff are important in delivering a health promoting school. Nutritional standards are an effective tool in encouraging healthier eating habits among children. Reducing the cost of healthy foods at school induces children to eat more healthily. These three strategies are used to formulate policy options for BC.

8.7. Interviews

Interviews were conducted with key stakeholders to verify policy options, and criteria and measures. Interview participants consisted of one vice-principal and two cafeteria managers in BC's public education system. Participants' contact information

was acquired through the BC Ministry of Education website. Participants were contacted to participate in the study via email or telephone. Three semi-structured interviews were conducted via telephone. The semi-structured interview format allowed for a more free-flowing conversation between the interviewer and interviewee. The interview was centered on broad themes of school-based child obesity prevention. Participants were asked about the effectiveness of current school nutrition policies in BC that are aimed at promoting student health, how they could be improved, and to evaluate school support for the policy options.¹¹ Interviews were partially transcribed. Thematic analysis was used to identify common themes among the participants' responses.

The key findings from the interviews indicate that BC school staff would like to see the BC government do more to address students' health. As for tools to address students' health through the education system, most interviewees indicate that schools face a challenge in offering healthy food that is both affordable and appealing to students. In terms of knowledge and compliance with the Guidelines, interviewees felt that food service suppliers possess sufficient knowledge about the Guidelines, but welcomed more training on how to cost-effectively deliver food that meets nutritional standards. Interviewees indicate that their schools are adhering to the Guidelines to the best of their ability, but not fully. Most interviewees also welcomed a policy that would require the BC government to monitor and enforce the Guidelines.

¹¹ See Appendix for more details regarding the interviews, including a copy of the questionnaire.

Chapter 9. Policy Objective, Criteria for Evaluating Policy Options

This section outlines the policy objectives, describes the criteria and measures, and offers three policy options to strengthen BC's current school nutrition policy.

For BC's school nutrition policy to improve, both short-term and long-term objectives must be met. The long-term objective of the policy options is to reduce child obesity rates in BC to levels experienced in the late 1970's, before the steady rise in obesity. Obesity costs the BC healthcare system hundreds of millions of dollars every year. These costs are expected to rise in the coming years. In order to achieve this long-term objective, a more manageable short-term objective must first be met to ensure that BC is on the right path. BC's short-term objective is to reduce child obesity rate by 18 percent below current levels. BC's short-term objective should be realized within the next 2 to 5 years, while its long-term objective should be accomplished between 10 and 15 years.

9.1. Criteria and Measures

The policy options are compared based on four criteria: effectiveness, cost, implementation complexity, and key stakeholder acceptance.¹² Each criterion is given a

¹² Equity is not selected as a criterion in the analysis because of the presence of the CommunityLINK program, which provides funding to schools to support vulnerable student populations.

measure. Each measure has an index, and each policy option receives a score based on their ranking on the index. For most measures, a policy option that scores a high on the index corresponds to a numeric score of 3, while a medium on the index corresponds to a score of 2; and a low score corresponds to a 1. The cost and implementation measures are exceptions, with the lowest value scoring the highest. Scores for the policy options are tallied individually, and the policy option with the highest score is considered the most favourable option for the policy problem. Table 6 summarizes the criteria and measures used to evaluate the policy options.

Table 6: Criteria and Measures Matrix

| Criteria | | Description | Measure | Methodology |
|-------------------------------|---------------------------------------|---|--|--|
| Effectiveness | Lowers child obesity prevalence in BC | The extent to which the policy reduces child obesity rates in BC. | Child obesity rate: > 18% decline 10-17% decline 0-9% decline | (1.5) High (1) Medium (0.5) Low |
| | Improves school food environment | The extent to which the policy increases the likelihood that schools would comply with the Guidelines for Food & Beverage Sales in BC Schools | Compliance rate: 80-100% 50-79% < 50% | (1.5) High (1) Medium (0.5) Low |
| Cost | | The impact of the policy on the provincial government's budget | < \$3.2 million \$3.2 million- \$3.7 million > \$3.7 million | (3) Low (2) Medium (1) High |
| Implementation Complexity | | The ease of implementing the policy | The number of groups required to cooperate in order to effectively implement and maintain the policy | (3) 1-2 groups (2) 3-4 groups (1) 5 groups |
| Key Stakeholder Acceptability | | The extent to which BC families would support the policy | Resources required: Less than status quo | (1.5) High (1) Medium (0.5) Low |
| | | The extent to which BC schools would support the policy | Equal to status quo More than status quo | (1.5) High (1) Medium (0.5) Low |

Effectiveness

The effectiveness criterion is made of two components: one related to child obesity prevalence, and one related to the school food environment. Because this criterion consists of two components, each component is scored on a scale of 0.5 to 1.5,

rather than 1 to 3. The two scores are then summed to calculate total effectiveness. This ensures that each criterion receives equal weighting.

The child obesity prevalence criterion is defined as the policy's ability to reduce child obesity rates in BC, and is measured by the percentage decrease in obesity rates in BC. This criterion assumes that changes in school nutrition would be accepted by the children in terms of taste, and that children would not substitute food purchased at school with food from off-campus vendors. The rate of child obesity in BC is 7 percent. From 1992 to 2000, child obesity fell by 29 percent in Singapore. This translates into a 3.75 percent decrease in child obesity per year. Using Singapore's experience as a benchmark for effectiveness, and the maximum length of achieving BC's short-term goal, a policy option that is able to reduce the child obesity prevalence in BC by 18 percent or more scores high.¹³ A medium score is a policy option that is able to reduce the child obesity prevalence in BC between 10 percent and 17 percent. A policy option that reduces child obesity by 9 percent or lower receives a low score.

Improves school environment evaluates the extent to which the policy increases the likelihood schools would comply with the Guidelines. As of 2007, 7 percent of BC schools were fully complying with the Guidelines. School nutrition policies in Singapore serve as a role model for school compliance. A Singapore Health Promotion Board report (2014) shows that as of 2012, 95 percent of Singapore schools are adhering to school nutrition standards. Using Singapore's experience as a benchmark for compliance, a policy option that increases school compliance with the Guidelines to 80

¹³ This goal is also consistent with the government of Ontario, Canada's 2012 target of reducing the number of obese children by 20 percent within the next five years (Office of the Auditor General of Ontario, 2013).

percent or higher scores a high on the index. A medium score is a policy option that is able to increase school compliance to between 50 percent and 79 percent. A policy option that increases school compliance to 49 percent or less scores a low.

Cost

Cost evaluates the financial burden on the BC government's budget of implementing the policy option. BC's 2005 health-related initiative, ActNow BC is used as a benchmark for the amount allocated for health-related initiatives. As described in Chapter 5, ActNow BC saw the government transfer \$25 million to an NGO for the specific purpose of introducing programs in BC that would improve the health and well-being of British Columbians. ActNow BC is not a perfect measurement for the amount of BC government budget allocated for school nutrition policy. The programs introduced under the auspices of ActNow BC are not specifically aimed for schoolchildren's health. Considering this, \$25 million is not a realistic budget for a new school nutrition policy. To address this discrepancy, I take the proportion of children in BC public schools relative to the total BC population to calculate a figure for the amount of BC government revenues that theoretically could be used to fund a new school nutrition policy. I then translate dollars in 2005 in present value dollars.¹⁴ Table 7 shows the calculations for establishing government funds allocated to school nutrition. The BC public school student population accounts for 12 percent of BC's total population. After controlling for inflation, the value of BC government funds potentially available specifically for BC school children's health is approximately \$3.6 million. This value becomes the base measurement, in the cost analysis.

¹⁴ Bank of Canada (2014)

Table 7: Status Quo Cost Summary

| ActNow BC (2005) | Student Population (2013) | BC Population (2013) | % | % of ActNow BC (2005) | BC Government Funds (2014) |
|-----------------------------|--|-------------------------------------|----------|--------------------------------------|---------------------------------------|
| \$25,000,000 | 564530 | 4581978 | 12% | \$3,080,165 | \$3,616,353 |

A policy option that costs more than \$3.6 million scores high; a medium if it costs between \$3.2 million and \$3.6 million; and a low if it costs less than \$3.2 million.

Implementation Complexity

Implementation complexity assesses how difficult a policy option is to implement, and is measured by the number of groups that would be required to cooperate in delivering the policy option. A policy option that requires cooperation among various groups would be more difficult to implement than a policy option that requires the involvement of fewer groups. This is because of the time that would be necessary in coordinating the policy among the involved groups, and the difficulty in determining each group's role in delivering the policy. Five potential groups are taken into consideration: BC schools, government, parents, food service suppliers, and non-profit organizations. BC schools comprise of all staff, including principals, vice principals, teachers, and administrative staff, and of the trustees who work at one of the 60 boards of educations throughout BC. Government refers to the provincial government. Parents comprise of parents, or legal guardians, of children who are attending BC public schools. Food service suppliers covers any corporation or individual who supplies food in a BC public school. Non-profit organizations comprise of agencies that have signed agreements with the BC Ministry of Education that support and deliver programs in the school setting, such as Breakfast Club of Canada. A policy option that requires one or two groups to

cooperate scores low; three or four groups to cooperate scores medium; and five groups to cooperate scores high.

Key Stakeholder Acceptability

It is important for any policy to be accepted by those who are directly impacted by the policy. A policy that is not favourable to key stakeholders is less likely to be adopted. Moreover, a policy that requires significant resources from those directly impacted is less likely to be accepted than a policy option that requires fewer resources. Hence, the index for the measure is resources required. Time and money are valuable resources, and measure key stakeholder acceptability. A policy option that requires an increase in time or money scores a low on the index; a medium if it does not change the time or money required from the status quo; and a high if it requires less time or money. Less time or money could entail the BC government providing tools or financial aid to key stakeholders.

The two key stakeholders in the analysis are: BC families and BC schools.¹⁵ As mentioned in Chapter 6, BC families is broken down into three sub-groups: parents, students, and parent advisory council. All three sub-groups are considered when referring to BC families. Interviews with BC school staff are conducted to confirm the acceptability of the policy options for BC schools. The measure for the two stakeholders are scored on a scale of 0.5 to 1.5, and then added to calculate a total key stakeholder acceptability score with the same weight as the other criteria..

¹⁵ BC government was excluded as a key stakeholder in the analysis because of the overlap between government acceptability and the cost criterion.

9.2. Policy Options

This section outlines the three policy options that have been derived from the case study analysis to address the current gaps in BC's school nutrition policy. The three policy options are complementary to one another, and can be implemented together or separately. For the purpose of this analysis, the policy options are analyzed independently to determine which one is the best alternative in strengthening BC's school nutrition policy. Each of the policy options address nutrition in school, rather than physical activity, parental or teacher involvement, or some other criteria for a health promoting school. Although these features are key components for a health promoting school, BC's school policy already adequately meets the WHO's guidelines for physical activity for children, and criteria for parental and teacher involvement.¹⁶ However, criteria aimed at nutrition in schools are missing. Hence, the policy options are: training for food service staff, subsidize healthy foods, and legislate and enforce Guidelines.

9.2.1. *Training for Food Service Staff*

Unlike successful school nutrition programs in other jurisdictions, BC does not offer training to food service staff. The Guidelines for Food and Beverage Sales in BC schools came into effect in 2005, and mandated for all public schools by 2008. The BC Ministry of Education disseminates the Guidelines with a list of sell most (at least 50%), sell sometimes (less than 50%), and do not sell items to schools (0%). The onus is on schools to select food service suppliers that proactively meet the Guidelines (BC Ministry of Education and Ministry of Health, 2013). Problems could arise, however, if there is some ambiguity, or indifference, for food service suppliers on how to change their menus

¹⁶ Similarly for other criteria for a health promoting school

to meet the Guidelines. Other than the checklist of permissible foods, the only resources made available to food suppliers by the BC Ministry of Education are suggestions for planning healthy cafeteria meals, boosting sales, a school meal and school nutrition handbook, and a Dietician hotline.

This policy option involves the training of food service suppliers to give suppliers the knowledge to change their food menus at schools to better meet the Guidelines. Training for food service suppliers applies to only school cafeteria operators and not vending machine operators. The rationale for this dichotomy is that it is a bigger challenge for school cafeteria operators to formulate new recipes that incorporate numerous ingredients than for vending machine operators who typically only sell pre-packaged items. Training for food service suppliers would be in the form of a workshop, or seminar held in different regions throughout BC. The training sessions would be held on a yearly basis for food service suppliers. The rationale for holding the training sessions on a yearly basis rather than only once is to account for food service companies exiting and entering the market of supplying food to schools, and to account for personnel changes within the company. The purpose of the sessions is to ensure that food service suppliers have a complete understanding of the Guidelines, share recipes, and to create an environment for food service suppliers to ask questions that they may have about the nutritional standards for food sold at schools. Essentially, the purpose of the training session would be to ease the transition of adopting the Guidelines for food service suppliers.

9.2.2. Subsidize Healthy Foods

Given that healthy foods cost more than unhealthy foods (Rao et al, 2013), children can be dissuaded to eat healthily due to price constraints. When healthier foods are priced lower, students are more likely to choose healthier alternatives (Masse and de Niet, 2013). One of the categories of the Guidelines is for schools to offer competitive pricing for healthy foods. Competitive pricing refers to lowering the cost of healthy alternatives or raising the price of unhealthy foods. Many schools do not have the resources to lower the cost of healthier foods. Many schools cite lack of resources or finances as being a barrier to fully complying with the Guidelines (BC Ministry of Education and Ministry of Health, 2008). As of 2007, only 33 percent of schools use competitive pricing to encourage children to eat healthy foods (BC Ministry of Education and Ministry of Health, 2008). Among the 33 percent of schools using competitive pricing, it is unclear what competitive pricing mechanism schools are using.

The purpose of this policy option is twofold. Firstly, to make healthy foods more affordable for students who are purchasing food at school. Secondly, to make healthy foods more accessible to students by eliminating the price barrier for schools in complying with the Guidelines. Funding for the subsidy would likely require an increase in the BC Ministry of Education's budget. To further incentivize schools to comply with the Guidelines, the BC Ministry of Education would require schools to comply with the Guidelines or risk losing the subsidy.

This policy option would be tailored depending on the level of school. As mentioned earlier, unlike secondary schools, the majority of primary schools do not have kitchens, cafeterias, or vending machines. Therefore, this policy option would subsidize healthy foods for predominantly tuck shop operators in primary schools. For secondary

schools, this policy option would subsidize the cost of healthy foods for cafeteria and vending machine operators.

9.2.3. *Legislate and Enforce Guidelines*

BC's current school nutrition policy mandates schools to comply with the Guidelines for Food and Beverage Sales in BC Schools. This means that all schools are required to implement the rules and regulations outlined in it. However, very few schools are adhering to the Guidelines. The current school nutrition policy in BC is not a legislated requirement for schools, and there are no monitoring and enforcement programs to ensure that schools are complying with the Guidelines.

This policy option necessitates the legislation of the Guidelines for Food and Beverage Sales in BC Schools. A provincial law would force schools to comply with the Guidelines. Once legislated, a governing body would be established to investigate and to ensure that schools are continually adhering to the Guidelines. The penalties for non-compliance would be contained in the initial legislation bill. Other jurisdictions, including Ontario, California, West Virginia, and Kentucky have taken similar steps in legislating nutritional standards for school food and beverages (Center for Disease Control and Prevention, 2012; Ontario Ministry of Education, 2014). An example of a non-compliance penalty for schools in West Virginia that serves as a model for BC is removal of school vending machine privileges (West Virginia Department of Education, 2004).

In the next Chapter I evaluate the three policy options using the criteria outlined in Section 9.1.

Chapter 10. Policy Option Evaluation

In this Chapter the policy options are scored and ranked. At the end of the Chapter, a policy recommendation is provided based on the results of the analysis.

10.1. Training for Food Service Staff

Effectiveness

Training for food service staff would have only a limited range. As mentioned in Section 5.2, the majority of elementary schools do not have permanent onsite cafeterias. The majority of junk food found in elementary schools emanates from tuck shops or food-sales based fundraising. Rather than complex recipes that require numerous ingredients, tuck shops typically sell simple items with few ingredients similar to snacks. Therefore, there would only be a limited benefit in training tuck shop operators about creating healthy recipes that meet school nutrition standards. Moreover, training for food service staff would not have any impact on food sold through fundraisers. The effectiveness of this policy option in secondary schools would also be limited due to the fact that the policy option does not address food and beverages sold through vending machines.

As for compliance with the Guidelines, without any monetary or disciplinary incentives to encourage food service suppliers to use the training to make healthy food that meets school nutrition standards, there is no guarantee that food service suppliers would comply with the Guidelines. Moreover, this policy option does not cover food and

beverages sold through vending machines. Hence, training for food service staff scores LOW on both effectiveness criteria.

Cost

In 2006, England allotted £2m for the establishment of regional training kitchens for schools (Gillie and Long, 2011). Using England's experience as a yardstick to gauge the cost of training food service suppliers in BC schools, £2m translates to \$3.5 million CDN.¹⁷ However, considering that the number of state-funded primary and secondary schools in England is twelve and a half times the number of BC public schools, the cost of training food service suppliers in BC schools would most likely be less than this cost estimate. Using \$3.5 million and then dividing it by the percentage of BC public schools as a proportion of England state-funded schools¹⁸, I estimate that training food service staff would cost the BC government \$280,000. To account for differences in land size, I multiply this number by the percentage of England's total area as a proportion of BC's total area.¹⁹ The final cost calculation is \$2.03 million. Therefore, the policy option scores a LOW on the cost index.

Implementation Complexity

Training for food service staff would require cooperation among public schools, food service suppliers, and government. In total, this option would require the cooperation of three groups, and therefore scores a MEDIUM on the implementation complexity index.

¹⁷ Bank of Canada (2014), and currency conversion of £1=\$1.53 CDN (Bank of Canada, Retrieved on March 3, 2014).

¹⁸ 1604 public schools (British Columbia Teachers' Federation, 2012); 20,065 state-funded schools (gov.uk.government, 2013).

¹⁹ European Land Information Service (2008); Statistics Canada (2005).

Key stakeholder Acceptability

Training for food service staff would not require any additional resources from BC families or schools. Both secondary schools and parents with children in secondary school would benefit from the increased skills and knowledge of food service suppliers in preparing healthy, tasty recipes for students. Findings from interviews with regional cafeteria managers in BC schools corroborate BC school support for this policy option. Hence, this option scores a HIGH on key stakeholder acceptability for both key stakeholders..

10.2. Subsidize Healthy Food

Effectiveness

Sturm and Dater (2008) examine the relationship between food prices and BMI levels among schoolchildren K to 5. The results of their study show that children's weight is significantly related to fruit and vegetable prices, and this relationship is stronger for older children, children living in poverty, and children at risk of being overweight. The study finds that a one standard deviation increase in fruit and vegetable prices increases children's BMI levels by 0.09 units by grade three and 0.18 units by grade five. Moreover, children in poverty are 50 percent more sensitive to price changes in fruit and vegetables, while those at risk of being overweight are 39 percent more sensitive. These findings indicate that price plays a strong role in individuals' dietary choices and can be a barrier to eating healthy at school. French (2003) finds that a price reduction of 10, 25, and 50 percent on healthier snacks results in an increase in sales of health snacks by 9 percent, 39 percent, and 93 percent respectively. Extrapolating the results of French's and Sturm and Dater's studies, I conclude that subsidizing healthy food can reduce the

prevalence of child obesity in BC by at least 18 percent. Therefore, this policy options score a HIGH on the ability to reduce child obesity rates in BC measure.

As for increasing school compliance with the Guidelines for Food and Beverage Sales in BC Schools, Reynolds Secondary in Victoria, BC demonstrates the potential efficacy of subsidizing healthy food (Dietitians of Canada, 2007). The school uses competitive pricing to lower the cost of healthy foods. In addition to significantly increasing the sale of milk and water, Reynolds Secondary is one of the few BC schools that have been successful in implementing the Guidelines. Although it is not possible to isolate the school's compliance with the Guidelines specifically on competitive pricing, lower healthy food options have a positive correlation with compliance. To incentivize compliance, this policy option also requires schools to continually adhere to the Guidelines, or risk losing funding. Therefore, I conclude that this policy option would increase the school compliance rate with the Guidelines to at least 80 percent. Subsidizing healthy foods scores a HIGH on the ability to increase school compliance with the Guidelines.

Cost

Ohinmaa et al (2011) investigate the cost of implementing and maintaining a CSH program in Nova Scotia, Canada. It shows that the proportion of provincial government finances that were used to subsidize school food and school food policy programs in the 44 schools amounted to \$344,515 or \$7830 per school.²⁰ Using \$7830 as an estimate for the cost of subsidizing healthy foods per school, and then multiplying

²⁰ Although this amount includes funding for both physical activity and nutrition programs, I am assuming that the majority of the funding was directed towards subsidizing nutrition programs.

the amount by the total number of BC public schools²¹, I estimate that the cost of this policy option would be approximately \$12.6 million per year. Therefore, this policy option scores a HIGH on the cost index.

Implementation Complexity

This policy option would require the cooperation of government to supply and distribute the funding for the subsidy, schools to receive and implement the subsidy, and NGO's and food service staff to supply the healthy foods to students. In total, this policy option would require the cooperation of 4 groups, and therefore scores a MEDIUM on the implementation complexity index.

Key Stakeholder Acceptability

This policy option would require additional time from schools to manage and distribute the subsidy to food service suppliers. However, given that interviews with key stakeholders in BC schools indicate that schools struggle with providing healthy food at affordable prices, the gains from cheaper healthy food items in schools would outweigh time lost from schools. As for BC families, this policy option would not require any additional resources. Parents and students would both benefit from more affordable healthy foods at school. Moreover, Slusser et al (2011) find that cost is the most common barrier for parents in providing healthy foods to children. Therefore, this policy option scores a HIGH on the key stakeholder acceptability for both key stakeholders.

²¹ 1604 public schools (British Columbia Teachers' Federation, 2012)

10.3. Legislate and Enforce Guidelines

Effectiveness

Woodward-Lopez et al (2010) examine the impact of California's legislatively mandated nutrition standards for food and beverages sold in schools. It finds that legislated school nutrition standards successfully improve dietary intake among schoolchildren. Although the researchers did not assess child obesity specifically, post-legislation saw children at school and home consume more water and fruit, and less soda and junk food. Jaime and Lock (2009) support the case for school nutrition standards. In the researchers' meta-analysis they find that school nutrition guidelines are an effective tool to improve schools' food environment and students' diet. Public Health England (2013) shows that since the introduction of legislated school nutrition standards, the obesity rate among 2 to 11 year olds in England has declined by 31 percent. This translates to a 5.2 percent decrease per year. I conclude based on these findings that legislating and enforcing the Guidelines would decrease the child obesity rate in BC by at least 18 percent. Therefore, this policy option scores a HIGH on the ability to reduce child obesity prevalence index.

As for increasing school compliance with the Guidelines, Woodward-Lopez et al also show that legislating school nutrition standards increase compliance with beverage standards from 54 percent to 71 percent, and compliance with food standards from 37 percent to 64 percent. The researchers suggest that 100 percent compliance was not achieved for two reasons: lack of monitoring in some schools, and costs. In Singapore schools, where monitoring is a regular occurrence, schools have been able to achieve a near 100 percent compliance rate. These findings exemplify the importance of monitoring and enforcing school nutrition standards when regulating food and beverages

sold at schools. Based on California's and Singapore's experience, I conclude that legislating and enforcing the Guidelines would increase the school compliance rate with the Guidelines to over 80 percent. Therefore, this policy option scores a HIGH on the school compliance rate index.

Cost

Costs for this policy option includes the costs of creating a monitoring and enforcement agency to ensure schools are complying with the Guidelines. Two costs are identified: agency personnel salaries and travel costs. First, agency personnel would be required to have expertise in nutritional content analysis. The Canadian Food Inspection Agency's (CFIA) salary for Inspection Management positions serves as an estimate for agency personnel salaries. Inspection Management positions at the CFIA receive a salary range from \$88,625 to \$106,740. I take the average salary for the Inspection Management position, \$97,635, and apply it to the cost calculation. Considering that the agency would be responsible for monitoring all BC public schools throughout the province, it is important that the monitoring and enforcement agency have enough personnel to effectively conduct investigations. I assume that the monitoring and enforcement agency would require five staff members. The five agency personnel would be strategically situated throughout the province to help lower travel costs. Two personnel would be based in Metro Vancouver due to the number of school districts in the region. The other personnel would be based in the Okanagan, Prince George, and Prince Rupert. To calculate travel costs, I use Canada Revenue Agency's (2014) automobile allowance rate of 54 cents per kilometer driven. As for distance, I assume that agency personnel would not have to travel the distance between the farthest school district from an agency personnel's base (Atlin and Prince Rupert), a total distance of

1375 kilometres²², more than five times per year. Therefore, the total distance is estimated to be 5,500 kilometers or less per staff member. The total cost calculation for this policy option is as follows:

$$(\$96,725 * 5) + [(0.54*5,500)*5] = \$498,475$$

So, this policy option would cost \$498,475 per year, and therefore scores a LOW on the cost index.

Implementation Complexity

Because this policy option is a top-down approach to improving children's health, the policy option only requires the involvement of one agency, the government. The BC government would be responsible for commencing the legislation process, receiving parliamentary approval, communicating the legislation to schools, and monitoring and enforcing the legislation. Therefore, this policy option scores a LOW on the implementation complexity index.

Key Stakeholder Acceptability

This policy option would require additional resources from both BC families and schools. Although parents would benefit from a healthier school food environment for their children, without a price mechanism in place to lower the cost of healthy foods, this policy option would most likely result in an increase in the price of healthy foods for parents and students. The same holds true for BC schools. Enforcing schools to comply with the Guidelines without any price mechanisms would result in schools having to pay more money to purchase healthier foods. Moreover, school staff would be responsible

²² Per Google maps

for ensuring that food and beverages in the school are complying with the Guidelines. This would require additional time from school staff. In addition, the general consensus among the stakeholder interviews is that schools that are already complying with the Guidelines would not have an issue with monitoring and enforcement. However, interview participants foresee schools that are not complying with the Guidelines to resist enforcement. This policy option therefore scores a LOW on the key stakeholder acceptability index for both key stakeholders.

Summary

Table 8 summarizes the outcomes of the policy options analysis.

Table 8: Policy Options Evaluation Summary

| Criteria | | Training for Food Service Staff | Subsidize Healthy Foods | Legislate Guidelines |
|--------------------------------------|--|--|--------------------------------|-----------------------------|
| Effectiveness | Mitigates child obesity prevalence in BC | LOW (0.5) | HIGH (1.5) | HIGH (1.5) |
| | Increases school food environment | LOW (0.5) | HIGH (1.5) | HIGH (1.5) |
| Cost | | LOW (3) | HIGH (1) | LOW (3) |
| Implementation Complexity | | (2) | (2) | (3) |
| Key Stakeholder Acceptability | BC families | HIGH (1.5) | HIGH (1.5) | LOW (0.5) |
| | BC schools | HIGH (1.5) | HIGH (1.5) | LOW (0.5) |
| TOTAL | | 9 | 9 | 10 |

10.4. Policy Recommendation

The results of the analysis indicate that legislating and enforcing the Guidelines for Food and Beverage Sales in BC Schools is the best option for improving the health and well-being of school children. The high score is primarily because of the high degree of effectiveness, low costs, and ease of implementation.

The above analysis demonstrates that school nutrition standards are an effective strategy in achieving BC's short-term goal of reducing child obesity rates in the province by 18 percent from current levels. Achieving this goal would set BC on the right track to achieve its long-term objective of reducing child obesity rates to levels experienced in the late 1970's. Although BC mandated the Guidelines in 2008, schools have been slow in implementing the new standards for school food and beverages. Legislating the Guidelines would send a strong signal to schools to get serious about improving the food environment in schools. Moreover, establishing a governing body to monitor and enforce the Guidelines would ensure schools' ongoing commitment to the Guidelines. Legislating and enforcing the Guidelines is also the least expensive policy option, estimated to cost the BC government over \$1.5 million less than the next cheapest policy option. Legislating and enforcing the Guidelines also requires the least number of cooperating agencies/groups in delivering the policy option, requiring the involvement of only the BC government.

The above analysis also highlights some potential issues with legislating and enforcing school compliance with the Guidelines. Inadequate resources are often barriers in complying with school nutrition standards. As mentioned in Chapter 5, many BC schools feel that they do not have the resources (personnel and financial) to fully implement the Guidelines. This policy option would not resolve this issue. The BC

Ministry of Education would need to work with school districts to reconcile these concerns before the Guidelines are monitored and enforced. If costs are an issue, funding from the CommunityLINK program could help mitigate some of these financial concerns. If lack of information is an issue, one possibility would be for the BC Ministry of Education to develop a Guidelines' best-practices model for schools to follow. The purpose of the model would be to highlight schools in BC that have effectively implemented the Guidelines. These 'best-practices' schools would serve as role models for less ambitious schools to exemplify how to successfully implement the Guidelines in schools.

Lastly, as mentioned in Chapter 9.2, the policy options are complementary to one another, rather than mutually exclusive. Ideally, the BC government would implement each policy option; however, this is perhaps not feasible. Given the cost barrier schools often face in complying with school nutrition standards, the BC government should seriously consider subsidizing at least a portion of the costs of purchasing healthy foods for schools. This would help solidify BC's short-term objective of reducing the number of obese children by 18 percent from current levels, and the long-term goal of reducing child obesity rates in BC to levels experienced in the late 1970's, before the rise in child obesity.

Chapter 11. Conclusion

Since the 1990's, the BC government has been making efforts to improve the health and well-being of schoolchildren through the education system. Despite BC's efforts, many children in BC do not consume a healthy diet at school. This study attempts to address the gaps in BC's school nutrition policy by identifying what criteria are indispensable for an effective school nutrition policy. Three case studies were examined that have been successful in improving schoolchildren's health. BC's school nutrition policy was then compared to the common features among the case studies. My findings indicate that the case studies examined demonstrate the following criteria that are not present in BC's school nutrition policy: training for food service suppliers, school nutrition standards that are being complied with, and affordable and accessible healthy food options. The secondary methodology confirmed the importance of these criteria for improving the health and well-being of school children.

Based on these findings, I formulated three policy options disparate from the status quo: training for food service suppliers, subsidizing healthy foods, and legislating and enforcing the Guidelines. Findings based on four criteria indicate the legislating and enforcing the Guidelines ranks the highest of the three policy options. Therefore, I recommend the legislation and enforcement of the Guidelines to the BC Ministry of Education because of the policy options ability to improve the school food environment, reduce child obesity prevalence, relative low costs, and ease of implementation. I also recommend that the BC government consider subsidizing some of the costs of

purchasing healthy foods for schools to help address some of the issues around inadequate resources. Given that obesity costs the BC economy an estimated \$730 million to \$780 million per year, and the estimates for subsidizing healthy foods in BC public schools is \$13 million per year, supporting schools through subsidization, in parallel with school nutrition standards, is a cost-efficient strategy to reduce the financial burden of obesity on BC.

The main limitation in this study is the lack of statistical data available. The data collected in this study emanate mainly from secondary sources. No interviews were conducted with individuals who work in the education systems or Ministries of Education from the case studies examined. Future studies would benefit from primary research in each of the case studies examined, rather than relying exclusively on secondary data sources. A second issue with the data collected is some of the information could be outdated. For example, the most recent BC Ministry of Education report that examined school compliance with the Guidelines was published in 2008. Future studies on this topic would benefit from more recent reporting, especially on the progress BC schools are making in meeting the school nutrition standards outlined in the Guidelines. Finally, due to time constraints, this study only examined provincially funded school nutrition programs, and did not investigate programs that are funded by non-government institutions or programs specific to individual schools.

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Appendix A.

Case Study Analysis Using CSH Framework

| CSH Principle | Criteria | Nova Scotia | Singapore | England |
|-----------------------|--|---|---|--|
| Teaching and Learning | Health service training for staff | No | No, but nurses trained as part of pilot project | No |
| | Physical education training for staff | No | No, but more PE teachers were hired | No |
| | Training for food service staff | Yes. Involved in ongoing discussions | Yes. Canteen vendors receive culinary training and individual consultations with nutritionists and chefs. | Yes. Regional kitchens established to train school kitchen staff. |
| | Health education for children: 1. Theoretical 2. Practical | 1. Yes. New health curriculum developed to be consistent with nutrition policy. 2. Yes. School gardens available at some schools | 1. Yes. Health education taught to children at all grade levels 2. Yes. Health curriculum emphasizes real-world applications | 1. Yes. Department for Education provides funding to schools to develop own curriculum. 2. Yes. Cookery classes available |

| CSH Principle | Criteria | Nova Scotia | Singapore | England |
|------------------------------|---------------------------------|---|--|--|
| Teaching and Learning | Physical education for children | Yes. 3 gym class periods per week. In addition, students received physical activity homework, and classes were rescheduled to allow for more for physical activity opportunities. - Recess everyday. | Yes. Time allotted for physical education increased. | No. No national PE curriculum at secondary school level. |
| | Nutritional Services | Nutritional standards | Yes | Yes with monitoring and enforcement |
| | Access to Healthy Food | Yes. The maxim for the program is "making the healthy choice the easy choice". Schools applied for grants and ran fundraisers to raise funds in order to lower the cost of healthy foods. | No | Yes. Cost of healthy ingredients subsidized |

| CSH Principle | Criteria | Nova Scotia | Singapore | England |
|--|------------------------|---|--|---|
| Nutritional Services | Food service programs: | 1. Yes. Universal | 1. Yes, for students with financial needs. \$12 million per year | 1. Yes, free for students in financial need |
| | 1. Breakfast | 2. No | | |
| | 2. Lunch | 3. Yes. Fruit and vegetable service once per month for all students | 2. No | 2. Yes, free for students with financial need |
| | 3. Fruit and Vegetable | | 3. No | 3. Yes, but only for children aged 4 to 6 |
| Community Partnerships and Services | Parental involvement | Yes. Planning and implementation of school nutrition policy. Workshops created to educate and support parents about changes to school nutrition. | Yes. Ongoing outreach efforts to include parents. | Yes. Parents informed and educated about changes to school nutrition policy |
| | Teacher Involvement | Yes. Planning and implementation of school nutrition policy. Teachers also brought children outside to allow for more physical activity opportunities | Yes. Ongoing outreach efforts to include teachers. | No evidence |

| CSH Principle | Criteria | Nova Scotia | Singapore | England |
|--|---|---|---|---|
| Community Partnerships and Services | Quality relationship with community: | High | Medium | Low |
| | 1. Community involvement | 1. Yes. Workshops held to involve community in implementing, promoting, and supporting health promotion and physical activity opportunities. Schools also kept community informed about school initiatives through local media and school newsletters. | 1. No 2. Yes. Health educational programs held in a variety of community settings. | 1. No 2. No |
| | 2. School access to facilities within the community | | | 3. Yes. Community is provided with access to school facilities post school hours. |
| | 3. Community access to school facilities | | 3. No | |
| | 4. 3rd party involvement | 2. Yes 3. Yes 4. Yes. Project Advisory Committee consisting of experts from a range of health-related fields was formed to achieve health promotion goals. Committee met on a monthly basis. | 4. Yes. Overweight children referred to pediatric specialists. | 4. No |

| CSH Principle | Criteria | Nova Scotia | Singapore | England |
|-----------------------|--|--|--|---|
| Implementation | Compulsory, voluntary, incentive-based | Compulsory | Incentive-based. Schools that demonstrate health promoting principles receive a CHERISH award valued at \$3,660 USD. | Compulsory |
| | Government-support | Yes. Project was partially funded by the Public Health Agency of Canada. | No | Yes. British government provides funding to schools through the School Food Trust |

Appendix B.

BC and CSH Common Features

| CSH Principle | Criteria | BC |
|-------------------------------------|--|--|
| Teaching and Learning | Training for food service staff | No |
| | Health education for children: 1. Theoretical 2. Practical | 1. Yes 2. Yes |
| | Physical education for children | Yes |
| Nutritional Services | Nutritional standards | Yes, but little to no monitoring and enforcement |
| | Food Service Program: 1. Breakfast 2. Snack | 1. Yes 2. Yes |
| | Access to healthy food | No. Very few schools use competitive pricing to lower the cost of healthy foods |
| Community Partnerships and Services | Parental Involvement | Yes |
| | Teacher Involvement | Yes. Voluntary |
| | Quality relationship with community: | Yes. High |
| Implementation | Compulsory | Voluntary |
| | Government Support | Yes. CommunityLINK program provides funding to schools to support vulnerable students; however, support does not have to be health-related |

Appendix C.

Interviews

| Stakeholder # | Position | Date of Interview |
|---------------|------------------------------------|-------------------|
| 1 | Secondary School Cafeteria Manager | March 14, 2013 |
| 2 | Secondary School Cafeteria Manager | March 14, 2013 |
| 3 | Secondary School Vice-Principal | March 14, 2013 |

Interview Questionnaire

Thank you for taking the time to speak with me this morning/afternoon. The purpose of this study is to identify gaps in BC's school nutrition policies/programs and to give recommendations to the BC Ministry of Education that would improve school children's diet and physical activity levels. I would greatly appreciate your help in conducting this research. The interview should not take more than 20 to 30 minutes. Your responses will remain strictly confidential.

1. What kind of policies or programs does your school currently have in place that are addressing children's eating habits and physical activity levels?
2. In your opinion, have these policies/programs been successful in improving children's eating habits or physical activity levels? Why or why not?
3. In your opinion, should the BC government be doing more to address child obesity?

If no, why do you think the BC government is not doing more to address childhood obesity?

If no, what more could the BC government be doing in the area of school-based obesity prevention?

4. In your opinion, is eating healthily at school affordable for students?
5. In your opinion, do food service suppliers have enough knowledge about the Guidelines for Food and Beverage Sales in BC Schools?
6. Does your school comply with the Guidelines for Food and Beverage Sales in BC Schools?
7. Why or why not?
8. In your opinion, should the Guidelines be monitored and enforced?
9. Would you support a program that educated food service suppliers on how to cost-effectively supply food that meets the Guidelines for Food and Beverage Sales in BC Schools?
10. Would you support a policy that required the BC government to monitor schools to ensure that they are complying with the Guidelines for Food and Beverage Sales in BC Schools?