

# Costs of Implementing and Maintaining Comprehensive School Health: The Case of the Annapolis Valley Health Promoting Schools Program

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## ABSTRACT

**Objective:** Comprehensive school health (CSH) is increasingly receiving renewed interest as a strategy to improve health and learning. The present study estimates the costs associated with implementing and maintaining CSH.

**Methods:** We reviewed the accounting information of all schools in the Annapolis Valley Health Promoting Schools (AVHPS) program in 2008/2009. We considered support for nutrition and physical activity programs by the public system, grants, donations, fundraising and volunteers.

**Results:** The annual public funding to AVHPS to implement and maintain CSH totaled \$344,514, which translates, on average, to \$7,830 per school and \$22.67 per student. Of the public funding, \$140,500 was for CSH, \$86,250 for breakfast programs, \$28,750 for school food policy programs, and the remainder for other subsidized programs. Grants, donations and fundraising were mostly locally acquired. They totaled \$127,235, which translates, on average, to \$2,892 per school or \$8.37 per student. The value of volunteer support was estimated to be equivalent to the value of grants, donations and fundraising combined. Of all grants, donations, fundraising and volunteers, 20% was directed to physical activity programs and 80% to nutrition programs.

**Discussion:** The public costs to implement and maintain CSH are modest. They leveraged substantial local funding and in-kind contributions, underlining community support for healthy eating and active living. Where CSH is effective in preventing childhood overweight, it is most likely cost-effective too, as costs for future chronic diseases are mounting. CSH programs that are proven effective and cost-effective have enormous potential for broad implementation and for reducing the public health burden associated with obesity.

**Key words:** Costs; cost effectiveness; public health; childhood obesity; nutrition; physical activity; school health

La traduction du résumé se trouve à la fin de l'article.

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Childhood overweight has become a major public health concern. In Canada, the prevalence of overweight in childhood has increased dramatically from 15% in 1977/78 to 26% in 2004.<sup>1,2</sup> School-aged children embodied the bulk of this increase as rates for children aged 2-5 remained relatively unchanged.<sup>1</sup> There is mounting evidence that childhood overweight persists into adulthood and is associated with a number of co-morbidities including type 2 diabetes mellitus, cardiovascular disease and some cancers, leading to a reduced life expectancy and quality of life.<sup>3,4</sup> The health care costs of overweight constitute a tremendous burden to society and are subject to sharp increases.<sup>5</sup> Direct health care costs associated with excess body weight in Canada were estimated to be \$1.8 billion in 1997,<sup>6</sup> and the overall annual national costs (direct and indirect costs) to be \$4.3 billion in 2001.<sup>5</sup> The health care cost of diabetes in Canada has been projected to nearly double between 2000 and 2016 from CAD \$4.66 billion to about CAD \$8.14 billion.<sup>7</sup>

School-based programs have a great potential to prevent childhood overweight because they reach almost all children and at an early age.<sup>8</sup> Comprehensive school health (CSH) has been shown to be very effective in preventing overweight and obesity.<sup>9</sup> CSH is an internationally recognized framework for supporting both education and health in a planned, integrated and holistic way.<sup>10,11</sup> CSH is the preferred term by the Joint Consortium for School Health but is synonymous with Health Promoting Schools, the term most commonly used in Europe and Australia, and with Coordinated School Health, commonly used in the United States.<sup>11</sup> Few primary prevention programs have included economic evaluations, and to

date, no studies have reported on the costs associated with implementing and maintaining CSH.<sup>12-14</sup>

The Annapolis Valley Health Promoting Schools (AVHPS) program is a CSH program with documented benefits regarding the prevention of overweight and obesity.<sup>9</sup> For other schools, school boards and governments, it is important to know the costs of this program as part of their considerations to invest in CSH. The aim of the present study is to estimate the societal costs of school-board-wide implementation and maintenance of CSH.

## METHODS

### The AVHPS program

The AVHPS project began in 1997 as a grassroots initiative by parents and school staff at two elementary schools who had become

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**Conflict of Interest:** None to declare.

**Table 1.** Total Direct Public Funding for the Annapolis Valley Health Promoting Schools Program Schools During the 2008-2009 School Year

Programs	Schools (n=44)		Students (n=15,195)		Total
	Range	Mean	Range	Mean	
CSH funds					
Direct funding to schools	0-5041	1107	0-175.76	3.21	48,725
Program administration*	–	2086	–	6.04	91,775
School Food Policy	0-2250	610	0-13.55	1.77	26,847
Provincial Breakfast Program	0-5364	2037	0-107.99	5.90	89,623
Sport Animator Program	–	1591	–	4.61	70,000
Other public funding†	–	399	–	1.15	17,545
Total direct public funding	–	7830	–	22.67	344,515

\* includes liability insurance costs, and funds for some school meetings and professional development.

† includes matched funding for after-school program from municipalities and from the Nova Scotia government.

increasingly concerned about the poor eating habits, physical inactivity and consequent health of their children and students. The initial project brought together partners from education, health, recreation, and food industry sectors to change the school environment and to make “the healthy choice the easy choice” for students. This included developing of healthy policies and practices, creating supportive environments, enabling strong community leadership and partnerships as well as providing personal skill development through education. As a result of these changes, students in these schools received more physical activity, had a variety of healthy food choices and were more educated on health and nutrition matters.<sup>15</sup>

In 2003, the Children’s Lifestyle and School Performance Study (CLASS) revealed that students attending the AVHPS schools had healthier diets, were more active, and were 59% less likely to be overweight or 72% less likely to be obese relative to their peers attending schools with no prevention programs.<sup>9</sup> These findings were instrumental to expanding the AVHPS program to a school-board-wide program including 44 schools. The AVHPS program addresses a range of health issues, however, the present study focuses on those related to the promotion of healthy eating and active living.

**Economic evaluation methods**

The AVHPS program, like other primary prevention initiatives, differs from health interventions as health benefits and health care cost savings are expected to happen in the future, for the most part decades later. This creates challenges related to estimating health benefits, valuing future costs and discounting rates, and to whether one should take a health care or societal perspective.<sup>16,17</sup> Additional challenges may also originate from the fact that CSH has more diverse incoming monetary and in-kind resources that include those from the health sector, the education sector, parents, the school community and local businesses.

Funding for the AVHPS program comes from several sources. The school board receives government funding earmarked for CSH, for Breakfast programs and for the School Food Policy. The school board distributes these to their schools based on the schools’ CSH plan. The AVHPS program approves these plans and their budgets. The AVHPS also receives support by individuals, firms and charitable organizations either in the form of monetary donations or of free products, labour or services. The monetary donations that supported healthy eating and physical activity were tracked using data from school-based transaction reports for the 2008-2009 school year. In most cases, these reports had specified the intended use of the donation.

The funds were used mainly for two purposes: to enhance student physical activity (during or after school) and to support school nutritional programs. Although some of the costs incurred were from investments in school kitchen equipment (like microwave ovens, refrigerators) and physical education equipment, these costs were relatively small and therefore not distinguished from operating costs.

In the fall of 2009, we reviewed the program cost accounts from all schools of the Annapolis Valley Regional School Board (AVRSB) for the 2008-2009 school year. We also reviewed resources coming to the program from the parents and the larger community using the AVHPS program documents for each of the schools. There was no systematic record-keeping of volunteer hours in support of CSH. We therefore interviewed four schools at varying stages of implementation on volume of volunteerism. We valued voluntary work using \$10 per hour as an estimate based on local wages for non-skilled persons. We expressed all monetary values in Canadian dollars in 2009 values, but did not apply discounting as all costs occurred in a single school year. We calculated costs by school, per student and school-board wide.

**RESULTS**

The direct public funding to implement and maintain CSH totaled \$344,515, which translates to an average of \$7,830 per school and \$22.67 per student (Table 1). The public funding by the province constituted \$140,500 earmarked for CSH funds, \$86,250 from the Provincial Breakfast Program funds, \$28,750 from the School Food Policy Program funds and \$17,545 from other public sources. The AVRSB also received \$70,000 per year in federal funding through the Sport Animator Program to support a physical activity coordinator.

The AVHPS program further received \$127,235 in the form of grants, donations and fundraising, of which approximately 20% was for physical activity and 80% for nutrition programs. The mean funding from grants, donations and fundraising was \$2,892 per school or \$8.37 per student. Two of the 44 AVRSB schools did not report incoming funding through grants, donations and fundraising. The single largest donation received was \$11,216.

Each of the AVHPS schools reported to be supported by volunteer time of staff and teachers. School facilities were reportedly used for nutritional and after-school activities. The value of these resources is not included in this analysis.

Table 2 summarizes volunteer activities along with acquired funding in four AVHPS schools. The estimated value of volunteer work ranged from \$875 to \$7,000 per year. On average, the value

**Table 2.** Costs Reported by Four Schools in the Annapolis Valley Health Promoting Schools Program on Volunteer Work, External Grants, Donations and Fundraising in the 2008-2009 School Year

	<b>Volunteers</b>	<b>Grants</b>	<b>Donations</b>	<b>Fundraising</b>	<b>Total</b>
School 1	Nutrition: 30 persons/week, 30 min/person = 15 hours Value: 15 x \$10 x 35 = \$5,250 Physical activity: 1 person 5 days a week; 1 hour/person = 5 hours Value: 5 x \$10 x 35 = \$1,750 Total Value: 20 x \$10 x 35 weeks = \$7,000	Nutrition: Lunchtime program \$400 Physical activity: Girls program \$1,500 Total: \$1,900	Nutrition: Food donations \$750 Money donations \$3,568 Other: Kitchen Facility \$2,016 Physical activity: None Total: \$6,334	Nutrition: \$3,542 Physical activity: None Total: \$3,542	Nutrition: \$15,126 Physical activity: \$3,650 Total: \$18,776
School 2	Nutrition: 1 person/day, 30 min = 2 h 30 min Value: 2.5 x \$10 x 35 = \$875 Physical activity: 0 Total Value: \$875	Nutrition: None Physical activity: None Total: 0	Nutrition: Occasional food donation; value unknown (+) Physical activity: None Total: unknown	Nutrition: None Physical activity: \$936 Total: \$936	Nutrition: \$875 (+) Physical activity: \$936 Total: \$1,811
School 3	Nutrition: 2 persons/day; 30 min each; Value: 5 x \$10 x 35 = \$1,750 Physical activity: 0 Total Value: \$1,750	Nutrition: None Physical activity: None Total: 0	Nutrition: Food donations \$900 Money donations \$295 Physical activity: None Total: \$1,195	Nutrition: \$335 Physical activity: Significant sports teams fund raising (+) Total: \$335 (+)	Nutrition: \$3,280 Physical activity: (+) Total: \$3,280 (+)
School 4	Nutrition: 2 persons/day; 30 min each; Value: 5 x \$10 x 35 = \$1,750 Physical activity: 1 person/day lunch hour, 1 person one morning/week = 6 hours Value: 6 x \$10 x 35 = \$2,100 Total Value: \$3,850	Nutrition: None Physical activity: None Total: 0	Nutrition: Food donations; value unknown Physical activity: None Total: unknown	Nutrition: None Physical activity: None Total: 0	Nutrition: \$1,750 Physical activity: \$2,100 Total: \$3,850 (+)
Overall mean	Nutrition: \$2,406 Physical activity: \$962 Total Value: \$3,368	Nutrition: None Physical activity: \$475 Total: \$475	Nutrition: \$1,882 (+) Physical activity: None Total: \$1,882 (+)	Nutrition: \$970 Physical activity: \$234 (+) Total: \$1,204 (+)	Nutrition: \$5,258 Physical activity: \$1,671 (+) Total: \$6,929 (+) (Total per student: \$20.1)

(+) Includes donations/fundraising that were not expressed in monetary value by the schools.

of volunteer activities (\$3,368) approximated that of acquired grants, donations and fundraising (\$3,561). In the estimation of the value of volunteer work, we considered an hourly wage of \$10. If we had used the minimum wage of \$8.60 in Nova Scotia in 2009, the value of the volunteer work would be 14% less. And if the volunteer work were valued at the average hourly wage of \$19.24, the value of the volunteer work would exceed the value of the public funding.

All funds listed in Table 2 were acquired locally with the exception of one school that obtained a \$1,500 external grant in support of physical activity. All four schools reportedly accepted food donations with a mean value of about \$2,000 per school (not including renovations). On average, the combined grants, donations and fundraising were about \$7,000 per school, of which approximately 75% was for nutritional programs. These may represent underestimations as food donations were not consistently reported or did not have any monetary value.

**DISCUSSION**

Declines in diet quality and activity levels with consequent increases in body weights have resulted in an urgent need for preventive actions. CSH addresses both education and health in a planned, integrated and holistic way, and has been shown to benefit healthy eating and active living.<sup>9,11</sup> Healthy eating and active living, in turn, have been demonstrated to benefit learning.<sup>11,18</sup> This has sparked increasing interests in CSH. However, a dearth of information on costs associated with the implementation and maintenance of CSH may keep public health decision makers from making the investment. The present study describes the costs of the AVHPS program for which the benefits of CSH had been described previously.<sup>9</sup> The study revealed annual public costs of \$344,515 for the school

board, or on average, \$7,830 per school and \$22.67 per student. Locally acquired grants, donations and fundraising contributed \$127,235, and the monetary value of volunteer work was estimated to double this. The cost of CSH is estimated to be approximately \$10,700 per school and \$31 per student. When further considering the value of volunteer work, this became \$13,600 per school and \$39 per student.

The costs for the AVHPS program seem similar to those of the Planet Health study<sup>19</sup> and CATCH<sup>20</sup> that estimated costs of US \$14 and US \$35 per student, respectively. As both the Planet Health study<sup>19</sup> and CATCH<sup>20</sup> were found to be cost effective, the AVHPS program will likely be as well if their school-board-wide expansion appears effective in preventing overweight and obesity. The costs of the MCG FitKid Project<sup>21</sup> and the New Zealand Apple project<sup>14,22</sup> were substantially higher at US \$956 and NZ \$1,281 per student, respectively.

Our cost analysis was greatly facilitated by the systematic financial documentation of amount and purpose of incoming funds by the school board and AVHPS program. However, not all donations, and particularly smaller donations, had been put on file. As such, we may have underestimated those contributions. Similarly, the value of donated foods like fresh vegetables and fruits, and breakfast cereals, were often not given a dollar value. Also, none of the schools had a systematic recording of volunteers contributing to in- and after-school activities. We had therefore captured these for the four sample schools. One may argue that revenues for schools and school jurisdictions may change with the introduction of healthful foods. Studies have shown both increases and declines in overall sales of foods.<sup>23,24</sup> Another study showed that of 17 schools and school districts that tracked revenue from fundraising after switching to healthier foods, 12 increased revenue and 4 reported

no change. The one school district that did lose revenue in the short term experienced a subsequent revenue increase after the study was completed.<sup>25</sup> If the latter study findings would apply to the AVHPS program, the costs to the schools and school jurisdiction would be less than estimated in this study.

The Nova Scotia Government provides funding to the AVRSB to support CSH in their schools. Other public funding supports breakfast programs, the implementation of a school food policy and the organization of physical activity in schools. As the school board's financial management team has understanding and appreciation for the integrated and holistic nature of CSH, the funds are pooled such that the implementation of CSH is facilitated while ensuring that the purposes of the funds are met.

The AVHPS program is recognized as a 'best practice'.<sup>15</sup> It is a 'real world' example of a grassroots approach and gradually evolved into an ongoing school-board-wide program. This 'real-world' program differs from most obesity prevention programs that are researcher initiated.<sup>12-14,19,20</sup> Data collection in researcher-initiated studies are generally most systematic, providing better-quality data. However, 'real world' practice-based evaluations are important as they provide better judgement of feasibility, political acceptability and sustainability and they also provide better estimates of actual cost of the CSH program.<sup>11</sup> The combination of 'real world' practice-based evaluations and researcher-initiated studies provides public health decision makers with broader perspectives on costs and effectiveness that will facilitate their consideration and decision making.

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## RÉSUMÉ

**Objectif :** L'Approche globale de la santé en milieu scolaire (AGSS) est de plus en plus remarquée comme stratégie d'amélioration de la santé et de l'apprentissage. Notre étude estime les coûts associés à la mise en œuvre et au maintien de l'AGSS.

**Méthode :** Nous avons examiné les données comptables de toutes les écoles du programme *Annapolis Valley Health Promoting Schools* (AVHPS) en 2008-2009. Nous avons examiné le soutien aux programmes de nutrition et d'activité physique provenant du système public, des subventions, des dons, du produit des collectes de fonds et des activités bénévoles.

**Résultats :** Le financement public annuel aux écoles participantes pour mettre en œuvre et maintenir l'AGSS s'est élevé à 344 514 \$, soit en moyenne 7 830 \$ par école (22,67 \$ par élève). De ce financement public, 140 500 \$ étaient liés à l'AGSS, 86 250 \$ aux programmes de petit déjeuner, 28 750 \$ aux programmes de politique alimentaire des écoles, et le reste à d'autres programmes subventionnés. Les subventions, les dons et le produit des collectes de fonds ont pour la plupart été obtenus localement. Ils se sont chiffrés à 127 235 \$, soit en moyenne 2 892 \$ par école (8,37 \$ par élève). La valeur du bénévolat a été estimée comme étant équivalente à la valeur combinée des subventions, des dons et du produit des collectes de fonds. De ces subventions, dons, fonds recueillis et activités bénévoles, 20 % ont été destinés à des programmes d'activité physique et 80 % à des programmes alimentaires.

**Discussion :** Les coûts publics de la mise en œuvre et du maintien de l'AGSS sont minimes. Ils ont exercé un effet de levier ayant permis de recueillir un financement local considérable, en nature et en espèces, qui témoigne de l'appui de la collectivité à l'alimentation saine et à la vie active. Lorsque l'AGSS prévient efficacement le surpoids chez les enfants, elle est probablement rentable, car les coûts des futures maladies chroniques augmentent. Les programmes de l'AGSS qui s'avèrent efficaces et rentables se prêtent extrêmement bien à une mise en œuvre généralisée et à la réduction du fardeau pour la santé publique associé à l'obésité.

**Mots clés :** coûts et analyse des coûts; efficacité (économie); santé publique; obésité infantile; nutrition; exercice physique; service hygiène scolaire