An Ounce of Prevention

A Public Health Rationale for the School as a Setting for Health Promotion:

A Report of the Provincial Health Officer

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BRITISH COLUMBIA
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Executive Summary

The data from a variety of British Columbian sources clearly indicate that adolescence is a time of special risk and adaptation for children as they pass through puberty and attain adult status. On this journey adolescents typically engage in a range of experimentation behaviours related to the developmental tasks they have to undertake during this time. In addition, habits of living, nutrition and exercise patterns also become established during these years which can have either beneficial or harmful impacts in later life.

These behaviours may or may not result in negative outcomes and they may or may not be socially sanctioned. As one example, involvement in extreme sports may be sanctioned, while street racing is not.

Similarly, if tobacco smoking has not been established by age 19, the chances are very good that an individual will never become a regular smoker.

Thus, the knowledge, attitudes and behaviours established in childhood and youth have significant implications, beneficial or otherwise, for behaviours and circumstances in later adult life. These outcomes are experienced by individuals, by communities and by society at large.

It is clear from the global experience that opportunities exist within the school setting from kindergarten to Grade 12 to significantly and positively influence many domains of youth health.

There is also a broad consensus on the types, frequency and dosage of interventions that will work to positively influence youth health and conversely, an array of interventions that have been shown to be ineffective.

British Columbia, in common with many other jurisdictions, has in the past failed to take universal advantage of this body of knowledge and the opportunities a “captive” school-age population presents.

This is said not to lay blame on any sector, but to reflect a reality. This report is presented at a time of significant public concern over certain aspects of youth health (for example, obesity), and at a time of change in the educational system in British Columbia.

British Columbia thus has an unprecedented opportunity to take action to address the health status of its youth, and government an opportunity to further address its New Era commitments to “intensify efforts to promote wellness and preventive care through better education, dietary habits and physical activity.”

The B.C. school health curriculum is open for review and innovation. Federal and provincial ministers of health are supportive of a pan-Canadian Healthy Living Strategy, which is currently under development and will focus on promoting healthy nutrition and increasing levels of physical activity.

There are indications that ministers of education across Canada are interested in working with health ministers to focus this strategy initially on the school setting.

In support of this strategy in B.C., we can ensure the school curriculum follows best practices which should include physical activity and healthy nutrition components in the Grades 11 and 12 curriculum.

This in turn will support and enhance a number of other current interministry government initiatives, such as Action Schools!BC, Active BC 2010, the Premier's Sport Award Program and Chronic Disease Prevention Initiatives.

Recommendations:

1. Re-commit to support Healthy Schools initiatives.
2. Develop and implement an evidence-based curriculum that runs from school entry to graduation as part of a comprehensive school health promotion process.
3. Develop an infrastructure (staff) at the provincial and regional levels to support implementation of comprehensive school health promotion.
4. Support multi-level training in health education in the form of university degree options and substantial in-service training for practicing teachers.
5. Set up an ongoing student health monitoring process to evaluate progress over time.
6. Establish a formal mechanism whereby all related ministries and other stakeholders in child and youth health contribute to comprehensive school health promotion.

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Introduction

The Provincial Health Officer is required by the *Health Act* to report independently to British Columbians on their health status, on health issues and on the need for legislation, policies or other actions that will improve the health of the population. In addition to producing an annual report, the *Health Act* states that reports on health issues affecting British Columbians should be issued from time to time in the manner the Provincial Health Officer considers most appropriate.

This review has been prompted by a number of factors. The first is recent attention on the health behaviours of children and youth – in particular, widespread concerns over the epidemics of obesity and physical inactivity. The psychological health of children and youth has also become a subject of public discourse, with concerns over bullying and violence in schools resurfacing following media coverage of high-profile incidents. In addition, the B.C. Ministry of Education has been involved throughout 2002 in a lengthy process of reviewing the graduation program, including the Career and Personal Planning (CAPP) course. Curriculum innovations will be piloted starting in September 2003.

Comprehensive health education in school is a key strategy in disease prevention and health improvement through childhood and adolescence, into adulthood.[1] This paper reviews the epidemiology of some of the more prevalent health issues in children and youth, discusses the conceptual framework for effective school health promotion and makes recommendations for strengthening school health education.

Principle among these is the recommendation for adoption of a healthy schools concept as a basis for planning and delivering education programs.

School health education has intrinsic value as a school subject per se, with content that is valid and important for students to learn and that usefully links to other subjects. This paper looks beyond that perspective to:

- Review available epidemiological data regarding child and adolescent health practices;
- Outline the nature and general content of comprehensive school health promotion as understood worldwide;
- Summarize research evidence regarding the effectiveness of school health promotion throughout the education cycle in contributing to increased health and well-being;
- Review elements of successful comprehensive school health promotion; and
- Provide recommendations regarding the strategic role of school health promotion in B.C. in the context of the present Ministry of Education review of school health programs, the Ministry of Health Planning's developing framework for core programs and services in public health and a federal interest in "healthy living" strategies.

The report and its recommendations are offered in the hope that those involved in the funding, development and delivery of school-based programs will find it helpful in guiding their worthy endeavours.

Epidemiological Data on Child and Adolescent Health

The major chronic diseases and injuries in B.C. place a huge burden on the provincial economy, accounting for about $4.5 billion annually in direct health-care costs and more than $9 billion in indirect costs such as lost productivity.[2] Musculo-skeletal diseases, injury, cardiovascular diseases, cancers, chronic respiratory diseases, mental health issues, and problems stemming directly from tobacco use, physical inactivity, obesity and alcohol and drug abuse create significant portions of this burden, and much of this burden is preventable. This preventable cost has a significant, adverse effect on the provincial economy and hampers the province's goals of healthy people and a sustainable health-care system.

Committing increasing funds to tertiary care in the form of new medical facilities, hospital beds and physician services will do very little to reduce the incidence of the conditions underlying the burden of illness. From a public health perspective, the answer lies in preventing and reducing the severity and prevalence of illness and injury in the first place through building a healthier population.

There is growing evidence linking healthy infant and child development to chronic disease prevention. It seems that early life experience can "imprint" both physiologically and psychologically in a way that affects the expression of disease throughout the life course. Early life experiences are particularly influential "because of the persistence of bio-behavioural attributes that are acquired early in life."[3] This suggests that to improve health over the long term, particular emphasis must be placed on critically sensitive periods during the life span, including the prenatal, early childhood and school years.

Over the past two decades, epidemiological studies have found the sensitive factors operating during these periods have an independent predictive effect on adult disease and disability.[4] The early childhood experience clearly impacts a child's readiness and ability to learn and respond to challenges.

From this understanding, the profound relationship between adult health status and school health programs is apparent. The common environmental stresses and behaviour patterns experienced or learned in childhood and adolescence contribute significantly to the incidence and prevalence of disease later in life, and conversely, learned patterns of healthy behaviour and stress management contribute to health throughout life.

This is true for a range of public health concerns varying from unintentional injury and death, violence, bullying and vandalism, teen pregnancy and abortion, alcohol and drug use and chemical dependency, sexually transmitted diseases (STDs) and HIV, tobacco use, obesity and both clinical and sub-clinical mental health problems.

The costly cardiovascular and cancer disease groups, like many musculo-skeletal conditions, are intimately intertwined with health practices and health environments that begin early in life and are formed throughout the school years. Unintentional injuries, the leading cause of mortality in children, youth and young adults, are far too frequently related to health practices such as alcohol and drug misuse.

Risk behaviours in youth tend to begin in late preadolescence and rise to a peak in the senior high school grades. This is demonstrated in several tracking studies. The US Youth Risk Behaviour Survey[5] traces a clear relationship between progression through adolescence and an increase in behaviours such as inadequate exercise, drug and alcohol misuse and smoking. These risks increase in prevalence with age through the school years. The Canadian Centre on Substance Abuse (CCSA) monitoring surveys of alcohol, tobacco and other drug behaviours reveal the same trend among Canadian youth.[6]

Here in B.C., the McCreary Centre's Adolescent Health Behaviour Surveys conducted in 1992 and again in 1998 confirm this same pattern of increasing risk throughout the school years.[7] These and other data are used in this report to show the trends in British Columbia.

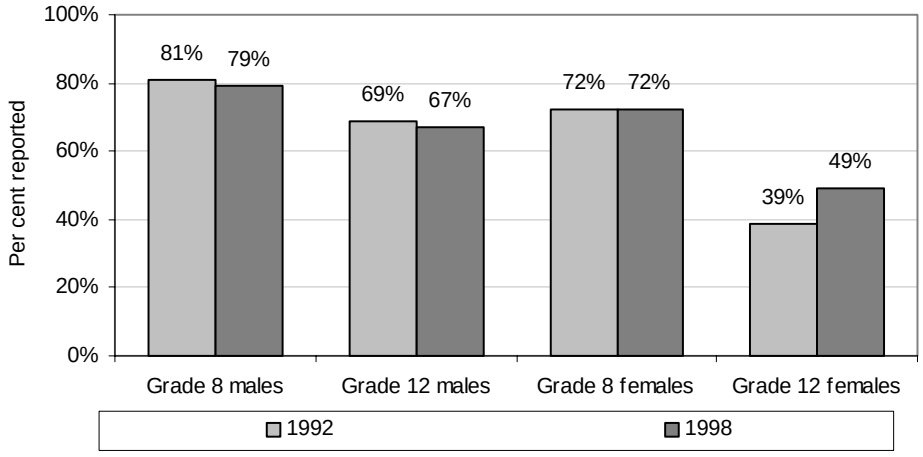
These epidemiological data are presented not to demonstrate that our youth are in desperate straits — indeed for some of the issues described, the trends are improving — but rather to illustrate that most risk behaviours increase in frequency and prevalence with age. Therefore, interventions that stop at Grade 10 (as most do in Canada) clearly will be suboptimal in their impact and effectiveness.

Physical Activity

Physical exercise constitutes a significant protective factor against a range of chronic illnesses. Physical inactivity is conservatively estimated to cost the B.C. health-care system in excess of $250 million per annum (unpublished data, Ministry of Health Planning, 2003). Regular exercise among youth declines as the grade of schooling increases.[8]

In British Columbia, 58 per cent of youth aged 12 to 19 are not active enough for optimal growth and development (1998/99 National Population Health Survey). In 1992, 81 per cent of Grade 8 males and 72 per cent of Grade 8 females reported engaging in regular exercise. In the same year, only 69 per cent of Grade 12 males and 39 per cent of Grade 12 females reported exercising regularly. In 1998 the figures were 79 per cent and 72 per cent respectively for Grade 8 males and females, declining to 67 per cent for Grade 12 males and 49 per cent for Grade 12 females. These data show that teens consistently exercise less as they grow older (Figure 1) (though the increase in activity levels in Grade 12 females 1998 versus 1992 is to be welcomed if it has continued). This decrease in activity with age is of considerable concern because these increasingly prevalent sedentary habits will likely be carried into adulthood.

Figure 1: Per cent of B.C. students reporting regular exercise, 1992 and 1998



Source: The McCreary Centre Society. (1999). *Healthy Connections: Listening to BC Youth.*

A quarter of all U.S. children watch four or more hours of television each day; this is positively associated with both increased body mass index (BMI) and increased sub-cutaneous fat.[9] Statistics Canada reports that B.C. children and youth watch 14.7 and 10.9 hours of TV per week respectively.

Nationally, viewing time by children and youth decreased by one hour and two hours respectively over the last three years.[10]

> **August 13, 2003, OTTAWA** – A new national study funded by the **Canadian Population Health Initiative** suggests that children participating in unorganized activity such as art or dance as well as sports are significantly less likely to be overweight or obese. On the other hand, watching 3-5 hours of television per day could increase the likelihood by over 50% compared to watching 0-2 hours a day. The study of children age 7-11 by Mark Tremblay and Douglas Willms will be published tomorrow in the *International Journal of Obesity*, a research journal of the International Association for the Study of Obesity.
> Source: CIHI News Release, August 13, 2003.

Other benefits of an active healthy lifestyle include higher levels of self-esteem, lower levels of anxiety and stress and an increased ability to perform challenging tasks.[11]

Healthy Eating

Healthy eating contributes to physical and emotional well-being and significantly affects many aspects of student health. Good nutrition also improves children's ability to succeed at school. However, as children get older and have greater control over their food choices, they are more susceptible to unhealthy eating practices. For example, in a 1998 report on the health of Canadian youth, about 70 per cent of all Grade 6 students ate breakfast daily. As grade level increased there was a consistent decline in the proportion eating breakfast daily, with only 55 per cent of males and 40 per cent of females doing so in Grade 10.[12]

Another eating practice of concern is excessive consumption of sweetened drinks that displace milk in the diets of elementary school children. The nutritional consequences of this trade-off are higher calorie intake, and lower intake of protein, calcium and other important minerals.[13]

Healthy eating throughout life prevents many long-term health problems. The school setting provides important opportunities for learning and practicing healthy eating habits that can be carried on into adulthood. The majority of B.C. adults do not consume enough milk products and fruits and vegetables for good nutrition. They also eat too many foods that are mostly fat and sugar. Therefore, many men and even more women have inadequate intakes of several important vitamins, minerals and vitamins.[14]

Obesity

The rate of obesity continues to increase among Canadian children and youth. In the 1998/99 National Longitudinal Survey of Children and Youth, more than one-third of Canadian children were classified as overweight and 18 per cent as obese.[15] More boys (19 per cent) than girls (17 per cent) were classified as obese but the per cent classified as obese drops as children age. Obesity is more common (25 per cent) in children living in families with incomes below the low income cut-off (LICO) than those above (16 per cent). Not surprisingly, fewer obese children (38 per cent) were active compared to non-obese children (47 per cent). Many obese children go on to become obese adults and as a result, experience a heightened risk of cardio- and cerebro-vascular diseases, type II diabetes, certain cancers and many musculoskeletal disorders.

Data collected from schools in Richmond, B.C., from Fall 1999 to Spring 2003, as part of the Healthy Bones Study at the University of British Columbia (UBC) and Action Schools! pilot study, suggest rates of obesity and overweight in the involved schools has steadily increased from 25 to 36 per cent in the 10 to 12 year olds who were sampled (Heather McKay, unpublished data).

Body Image

Body image dissatisfaction is a strong precursor to emotional problems, unhealthy nutrition habits and in extreme cases, to eating disorders. The McCreary data suggest one-half of B.C. students are dissatisfied with their bodies. Boys tend to want to gain weight in the form of muscle, while girls wish to lose weight. These practices increase with age and held steady from 1992 to 1998.

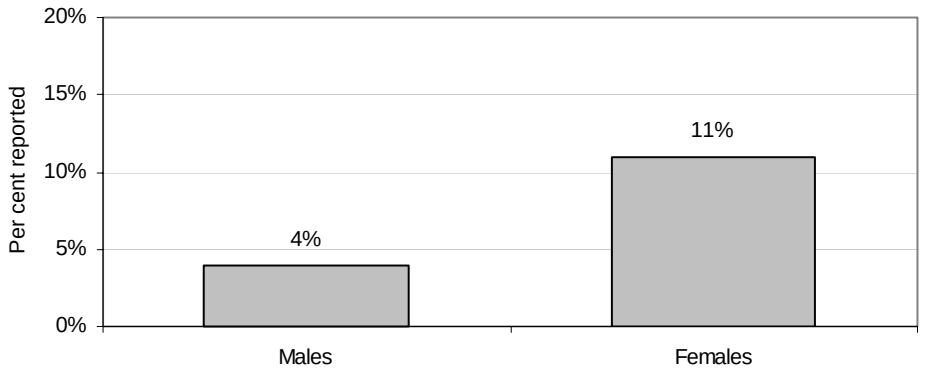
> Fifty per cent of B.C. high school students are dissatisfied with their bodies.

Mental Health

Suicidal contemplation and actual suicide attempts correlate highly with other health problems such as depression and self-loathing. Seven per cent of students in Grade 12 in 1998 reported having attempted suicide, a trend appearing to hold steady since 1992.

More alarming is that fully one-fifth (21 per cent) of females and 12 per cent of males had contemplated taking their own lives. And eleven per cent of girls aged 15 in 1998, and four per cent of boys, reported actually attempted suicide (Figure 2). This is only a slight decline from 1992.

Figure 2: Per cent of B.C. student (age 15 years) who attempted suicide, 1998



Source: The McCreary Centre Society. (1999). *Healthy Connections: Listening to BC Youth.*

Bullying

Bullying and violence also present significant health risks to children and adolescents. The National Longitudinal Study of Children and Youth (NLSCY) indicates that 14 per cent of Canadian youth bully others, and five per cent are victims.[16]

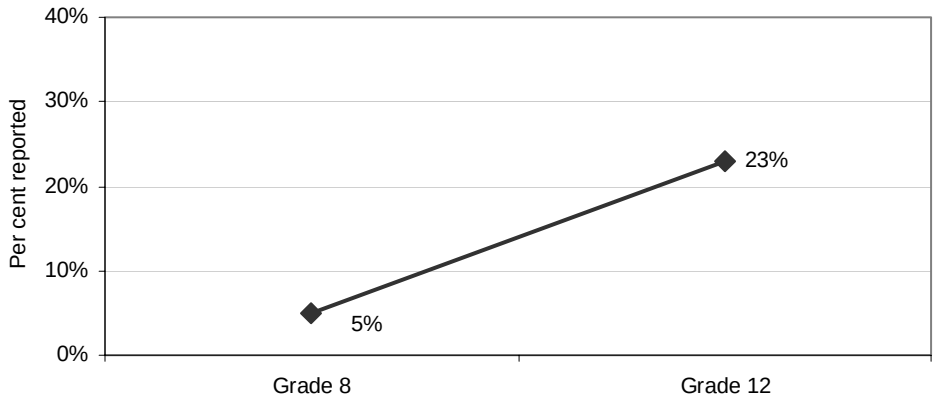
Both groups show significant emotional dysfunction. Bullying tends to progress in seriousness and the earlier the preventive intervention, the more effective it will be.

Fourteen per cent of Canadian youth are bullies; the seriousness of bullying progresses over time, and the earlier the preventive intervention, the better the outcome.

Tobacco Use

Diseases caused by tobacco use constitute the single greatest preventable cause of illness and death in British Columbia. Economic costs of tobacco use in B.C. are estimated at over $1 billion annually.[17] Over 90 per cent of smokers start before the age of 19 years, making adolescence a crucial time for smoking prevention. In 1998, five per cent of Grade 8 students reported smoking; this rose sequentially by grade to 23 per cent of Grade 12 students (Figure 3). Smoking rates for 15 to 19 year olds in B.C. dropped from 28.6 per cent in 1994/95 to 19.3 per cent in 1998/99 and 16.5 per cent in 2000/01.[18-19]

Figure 3: Per cent of B.C. students who smoke, 1998



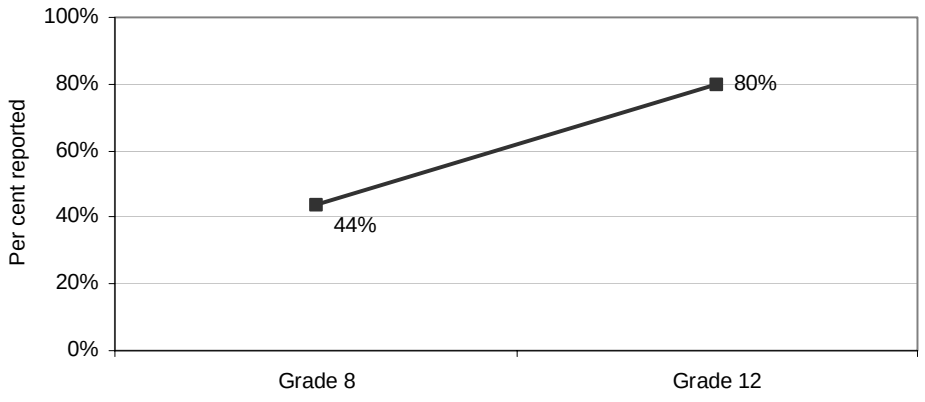
Source: The McCreary Centre Society. (1999). *Healthy Connections: Listening to BC Youth.*

Alcohol

Alcohol abuse is associated with motor vehicle and aquatic injuries and deaths, vandalism, alcohol poisoning and violence. Harmful use patterns started young and carried into adulthood exacerbate these problems, and chronic alcohol abuse leads to a number of acute and chronic disease conditions. The cost of alcohol abuse in B.C. in 1992 (the most recent year for which data are available) was estimated at $938 million.[20] Alcohol use rises steadily with age among B.C. adolescents, from about 44 per cent in Grade 8 to 80 per cent in Grade 12 (Figure 4).

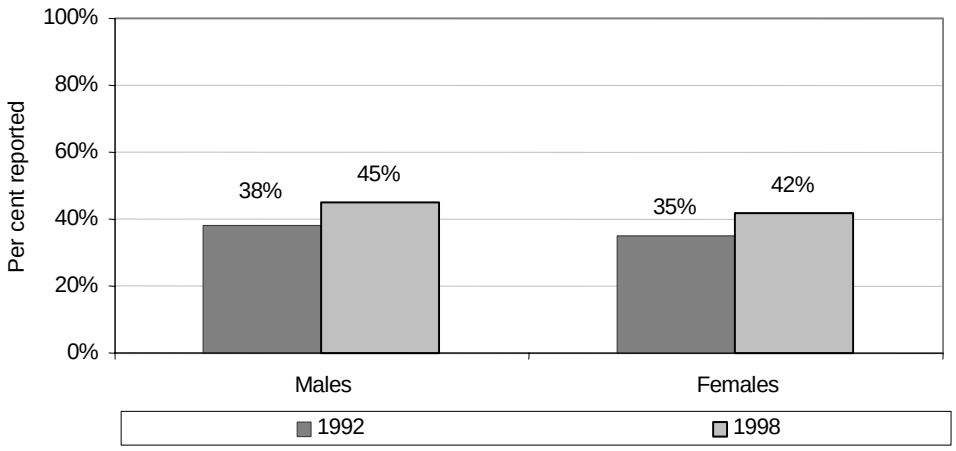
Almost half of all B.C. teens engaged in binge drinking in 1998 – 45 per cent for males and 42 per cent for females. This is an increase from 1992, when 38 per cent of male teens and 35 per cent of female teens were engaged in binge drinking (Figure 5).

Figure 4: Per cent of B.C. students who reported alcohol use in the past year, 1998.



Source: The McCreary Centre Society. (1999). *Healthy Connections: Listening to BC Youth.*

Figure 5: Per cent of B.C. students engaged in binge drinking in the past month (of youth who have used alcohol), 1992 and 1998.



Note: Binge drinking is defined as consuming 5 or more standard drinks of alcohol within a 2-hour period in the past 30 days.

Source: The McCreary Centre Society. (1999). *Healthy Connections: Listening to BC Youth*.

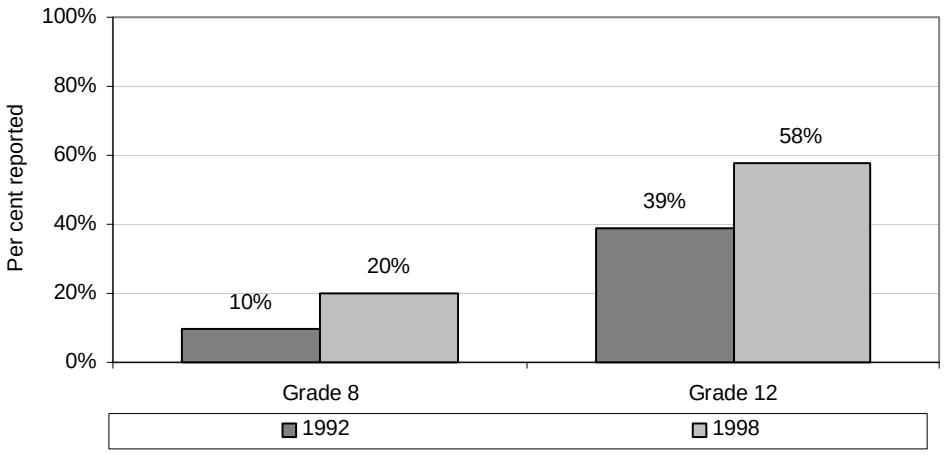
Cannabis

Marijuana use, especially regular use, is associated with behavioural and performance problems in adolescence. Heavy use may lead to dependence. As with tobacco, marijuana carries significant risks for respiratory health. Regular marijuana use is associated with cognitive impairment and increases the risk of poor school performance and dropping out.

In B.C., marijuana use increases three- to four-fold during adolescence and is highest among Grade 12 students. From 1992 to 1998, marijuana use increased more than any other behaviour change measured in the McCreary studies. This increase was most marked in younger students, where it doubled from 10 per cent to 20 per cent in 13 year olds.

Increases in marijuana use among students in the higher grades were also large, escalating from 39 per cent in 1992 to 58 per cent in 1998 among 17 year olds (Figure 6).

Figure 6: Per cent of B.C. students who reported marijuana use, 1992 and 1998



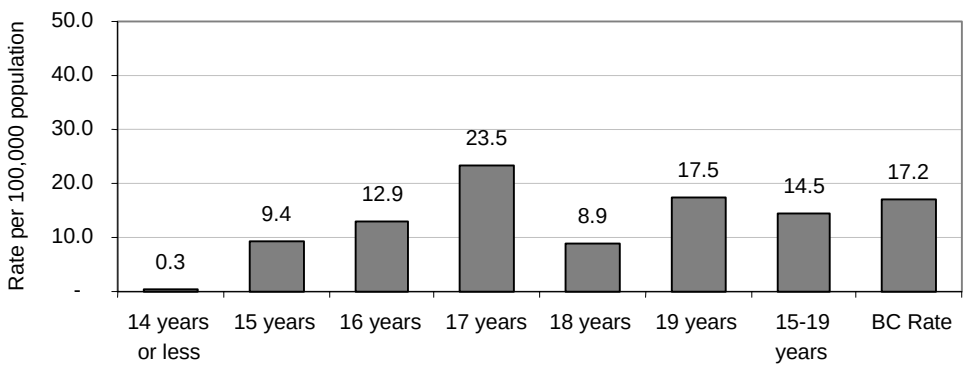
Source: The McCreary Centre Society. (1999). *Healthy Connections: Listening to BC Youth.*

Sexual Activity

Unprotected sex can lead to HIV, other sexually transmitted diseases (STDs) and unplanned pregnancy. Sexual activity increases with grade level. Forty-five per cent of Grade 12 students in B.C. in 1998 reported being sexually active. Of these, 25 per cent reported using withdrawal or no method of birth control at all.

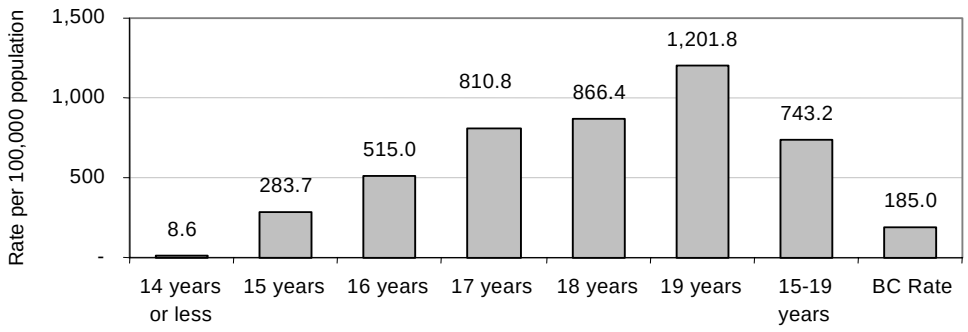
Female teens aged 15 to 19 have the highest the rates for gonorrhea and chlamydia (STDs capable of causing pelvic inflammatory disease and female infertility) in B.C. Figures 7 and 8 illustrate the overall gonorrhea and chlamydia rates for teens in this province.

Figure 7: Rates for Gonorrhea, B.C., 2002



Source: BC Centre for Disease Control. Population estimates from Health Data Warehouse, prepared using data from BC STATS, B.C. Ministry of Management Services.

Figure 8: Rates for Chlamydia, B.C., 2002



Source: BC Centre for Disease Control. Population estimates from Health Data Warehouse, prepared using data from BC STATS, B.C. Ministry of Management Services.

Sexual Abuse

By age 17, about one in four girls in B.C. schools reports having been sexually abused at some time in her life. Sexual abuse in childhood is related to a variety of health problems throughout life. In the McCreary data this proportion held fairly steady from 1992 to 1998.

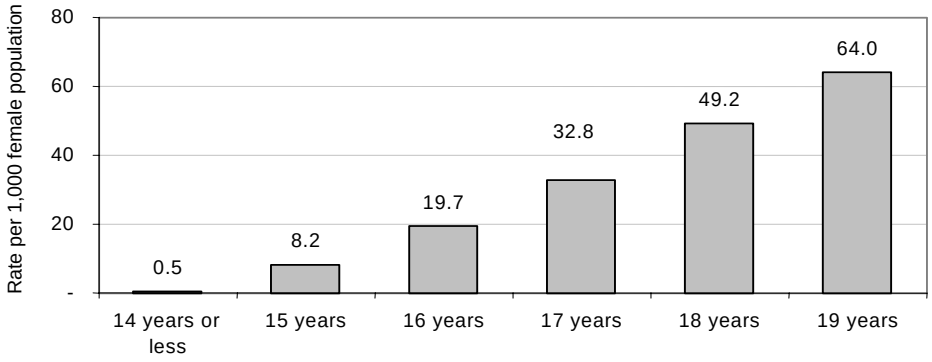
One in four B.C. high school girls reports having been sexually abused at some time in her life.

Pregnancy

While British Columbia Vital Statistics indicate a continuing decline in the rate of teen pregnancy, the rates are still much higher than those achieved in Europe. Pregnancy rates in B.C. range from 8.2 per 1,000 girls at age 15 to 64.2 per 1,000 girls at age 19 (Figure 9). Termination of pregnancy occurs in about 50 per cent of these pregnancies (Figure 10).[21] Teen pregnancies not only produce significant immediate health-care costs, but teenage mothers may experience continuing socio-economic problems. For example, here in B.C., the cost of economic support for a non-working young single mother and her child will be $82,000 by the time the child reaches elementary school.[22]

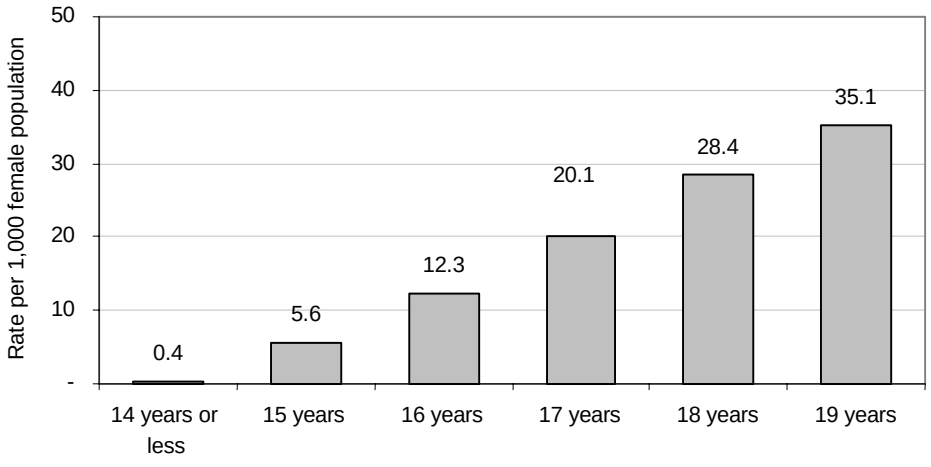
Northwest Environmental Watch notes that B.C. teen pregnancy rates are the lowest in the Pacific (Northwest) region.[23]

Figure 9: Teen Pregnancy Rates, B.C., 2001



Source: B.C. Vital Statistics, B.C. Ministry of Health Planning *Unpublished Tables*

Figure 10: Teen Abortion Rates, B.C., 2001



Source: B.C. Vital Statistics, B.C. Ministry of Health Planning. *Unpublished Tables*

School Connectedness

School connectedness is an important predictor of academic performance, positive career trajectory and a clear protective factor against a range of problem behaviours.[24] Data on school connectedness were not available in 1992.

In 1998, only 12 per cent of B.C. Grade 11 and 12 students felt a strong connectedness to their school. This contrasts with 23 per cent reporting connectedness at Grade 7. Connectedness was reportedly lowest in Grade 9 and 10 suggesting that this may be a critical time for interventions. Connectedness, an important component of resilience, was measured in terms of student perceptions of their own connectedness with peers, teachers and the social and academic processes at school.

Eighty-eight per cent of B.C. Grade 12 students do not feel a strong connection to school.

Summary

The data in this report exemplify many but not all of the major health concerns for B.C. youth. They do not break down the population by risk groups. For example, in the case of aboriginal youth the rates of many of these conditions are sharply increased. Nor do they speak to the ancillary costs of lost educational quality, opportunity or productivity. The principle point to be made is that clearly, preventive interventions for children and youth take on exceptional importance in both reducing economic costs and in improving the future health and functioning of children and youth.

Schools, because of their access to children and youth, their central role in child and youth development and their responsibility to teach, must figure prominently as partners in local community, provincial and national health promotion efforts. In light of the data, school health promotion becomes a critically important strategy in improving the health of British Columbians. And because the epidemiological data show that risk increases with age and in many cases is still on the rise in Grade 12, school health promotion must be targeted at all grades and not just the lower grades.

The Role of Schools in Disease Prevention and Health Promotion

The school provides an excellent setting in which to provide comprehensive health promotion and enhancement.[25] The role of the school in this regard is recognized by jurisdictions around the world. It is almost universally acknowledged that the school holds a critical place in human physical, social, emotional and intellectual development.

A number of examples of government and organizational statements follow.

The World Health Organization:

"Health is directly linked to educational achievement, quality of life and economic productivity. Research in both developing and developed countries demonstrates that school health programs can simultaneously reduce common health problems, increase the efficiency of the education system and advance public health, education and social and economic development in each nation."[26]

Statement on Promoting Schools, 4th International Conference on Health Promotion, Jakarta 21-25, 1997

"Every child has the right and should have the opportunity to be educated in a health-promoting school. The participants of the 4th International Conference on Health Promotion call upon international and national agencies, governments, communities, non-governmental organizations and the private sector to support the development of Health Promoting Schools.

They urge governments, groups and individuals to promote the concept of the health-promoting school as a sound investment in the future, when considering policies, priorities and expenditures. They call upon all agencies to support the integration of health-related issues into a comprehensive approach that enable schools to use their full potential to promote the physical, social and emotional health of students, staff, families and community members."

The Council of Europe/European Commission:

"Evidence shows us that the determinants of both education and health are indivisibly linked. The successful implementation of health promoting school policies, principles and methods, can contribute significantly to the educational experiences of all young people living and learning within them."[27]

Australia:

"The extent to which a nation's schools become health promoting schools will play a significant role in determining whether the next generation is educated and healthy."[28]

The United States:

"Schools could provide a critical facility in which many agencies might work together to maintain the well-being of young people."[29]

Canada:

A resolution of the Canadian Association for School Health, of which numerous federal and provincial bodies are signatories, states:
"The health and well-being of children and youth must be a fundamental value of Canadian society.

Recently, urgent health and social problems have underscored the need for collaboration among young people, families, schools, agencies, communities and governments in taking a comprehensive approach to school-based health promotion.

Experience and research evidence suggest strongly that a comprehensive school health approach can influence the health related knowledge, attitudes and behaviours of students. It is also recognized, however, that the primary determinants of health status such as genetics, socio-economic, cultural and environmental factors will require that realistic expectations of such an approach need to be established.

A comprehensive school health approach includes a broad spectrum of activities and services which take place in schools and their surrounding communities in order to enable children and youth to enhance their health, to develop to their fullest potential and to establish productive and satisfying relationships in their present and future lives." [30]

British Columbia:

In B.C., the Framework for Core Programs and Services in Public Health developed by the Ministry of Health Planning identifies the school setting as *"one of the most promising settings for helping children and youth develop healthy ways of living."**

These statements provide political support for school health promotion, but just what is comprehensive school health, the term used here in Canada to reflect a comprehensive approach to health promotion in the school setting?

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* A Framework for Core Programs and Services in Public Health. Working Paper, Draft #2. Population Health and Wellness, B.C. Ministry of Health Planning, January 2003.

Comprehensive school health embraces the following core elements:[31-32]

Health Instruction:
This includes health instruction at all levels from kindergarten to Grade 12, both separately and integrated into other curricula.

Preventive Health Services:
This includes personal guidance and counselling services, as well as early identification and referral of children and their families to needed health services, some of which may be ideally provided on site.

Social Support:
Social support includes role modeling, peer support and healthy policies for staff and students. These imply an active in-school effort to promote these supportive attributes.

A Healthy Physical Environment:
Schools must be healthy and safe places to work and learn. Environmental factors include sanitation, safety from harmful exposure to environmental contamination, a comfortable learning environment, an environment free from significant risks of injury and an environment where children feel safe both physically and emotionally.

Conversely, a healthy school environment does not expose children to unhealthy messages or influences.

In addition, a school that is health-promoting views itself as both a community in itself, and as an integral part of the wider community. Community involvement in the school is an important element of school health promotion.

Effectiveness of School Health Promotion

Numerous studies report the effectiveness of school health promotion in influencing the knowledge, attitudes and behaviours of students from kindergarten to Grade 12 and beyond. Some examples:

The School Health Education Study (SHES) in the U.S. provided landmark findings on the effectiveness of school health curricula.[20] This study of state-wide curricula found that over the course of a school year: with 20 hours of health instruction, student knowledge of content increased significantly; with 40 hours of instruction, students' health attitudes improved significantly; and with 60 hours of instruction, target behaviours themselves were affected significantly.

A meta-analysis of alcohol, drug and tobacco education evaluations* reported that most school programs influenced knowledge and attitudes, both of which are key precursors to future behaviour change, and that some programs were capable of reducing the onset of substance use itself.[33]

Another review of school-based substance abuse education programs in the U.S. reported that programs with a social skills approach and with parent and community support to the school were successful in reducing onset of tobacco, alcohol and drug use, and in increasing school connectedness and performance.[34] These findings are consistent with numerous individual program evaluations.[35], [36], [37]

* Readers may note a disproportionate number of substance misuse evaluations in this document. This is due to the fact that this area has been pursued more aggressively in program development and evaluation than many other areas of health. For example, in comparison there are extremely few evaluations of mental health promotion programs, an area only now beginning to receive attention. In addition, there is a convergence of themes between specific content areas and an evolution of school health away from content specific focus, toward a thematic focus.[35]

It has been found that the effects of such programs tend to diminish if they are not reinforced when students reach higher grades.[38] The need to continue school health through the senior high school years is evidenced in data indicating health risk increases with age. This is emphasized by the Centre for Addiction and Mental Health (CAMH) in its *best advic*e paper on substance abuse prevention, which concluded that school programs "*should be on-going from kindergarten to the last year of high school."*[39]

The U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) administers a significant portion of the world's research in school health effectiveness. It maintains an inventory of model programs that achieve affective, cognitive and behavioural outcomes.[40] The current trend in these programs is away from a problem focus (e.g. drugs) and toward a focus on building resilience. Many of these programs have shown great promise in improving the school environment, reducing tardiness and absenteeism, reducing bullying, improving cognitive performance and educational outcomes and reducing problem behaviours.

The Western Australian School Health Project now underway, another strengths-focused program, has so far demonstrated positive outcomes in behavioural intent, knowledge and school tone among the 70 participating primary and secondary schools.[41]

Studies from Singapore and Germany report success in school-based programs aimed at reducing obesity.[42-43]

In a review of interventions for weight loss and weight gain prevention among youth, Fulton, et al, note one study that specifically worked to reduce time spent viewing television showed significant mean decreases in body mass index in both boys and girls.[44]

Meta-analyses done for the U.S. Association of State and Territorial Health Officials and the Society of State Directors of Health, Physical Education and Recreation, report that where school health education is present and active, there is significantly less tardiness, absenteeism and class disruption, and increased overall academic performance.[45]

A recently released report from the Council of Minister's of Education Canada (CMEC) concluded that:

"*Educators and policy makers are keenly aware that sexual health can significantly affect student success. The study shows that young people continue to see schools as their main source of information about sexual health.*"[46]

Their scores on this survey indicate that students who rely on schools for such information are likely to know more about it than those who get their information elsewhere.

European studies indicate that comprehensive sexual health education coupled with adequate contraceptive availability can reduce teenage pregnancy without increasing sexual activity.[47] Teen pregnancy rates, birth rates and abortion rates in Scandinavian countries, the Netherlands and Germany are all lower than in B.C. European teens report fewer sexual partners and have lower rates of STDs.[48]

A recent comprehensive analysis of evidence-based best practices in school health instruction and policy in substance abuse prevention in Australia[49] offers some elements of promise for wider consideration. These include the following characteristics of successful programs:

- ✓ Parents and the wider community are involved.
- ✓ Health is a whole school responsibility.
- ✓ Instruction should be sequential and developmentally appropriate.
- ✓ Instruction should have a basis in expressed student needs.
- ✓ Instruction should begin before the onset of harmful practices.
- ✓ Interaction vs. didactic learning is a best fit for health instruction.
- ✓ Peer leaders hold promise for health instruction.
- ✓ Classroom teachers play a central role.
- ✓ The values and attitudes of the broader community must be considered.
- ✓ Focus should be on harm minimization as an end goal.
- ✓ Social skills are superior to factual information alone in achieving improvements.

One more recent development in school health relates to the focus on the school environment itself as a crucible of social development. Some work has been done in this area, replacing the idea of a curriculum that focuses specifically on building individual student resilience and assets, to one that promotes an overall school effort to make the school social environment conducive to healthy development.[50]

In assessing the value of school health education in several countries, Dwyer, et al, report that:

"Under best-estimate assumptions, school health education compares favourably with other programs. Arguments about whether the programs save money do not take into account the intrinsic value of averting the experience of disease.

Evidence suggests that, over time, such programs will generate external benefits by changing attitudes toward healthy behaviour."[51]

One comprehensive study in Europe[52] places the following estimates of cost benefit of school health programs:

- ✓ $1 spent on preventing tobacco use can save $19 in treatment costs for the consequences of smoking.
- ✓ $1 spent on preventing alcohol and drug abuse can save $6 in money spent on treating the consequences of that behaviour.
- ✓ $1 spent on education to prevent early and unprotected sex can save $5 on money spent in treating the consequences of that behaviour.
- ✓ For the integrated education program as a whole, nearly $14 was saved for every dollar spent.

A large body of research accumulated over the past two decades has identified the key factors to successful school health programs.[53],[54],[55],[56], [57], [58],[59],[60],[61],[62]

These are:

- ✓ Teacher training.
- ✓ Teacher comfort with the topic.
- ✓ Administrator support.
- ✓ Respect for the subject from administrators and teachers.
- ✓ Room in the day to teach it.
- ✓ Challenging content.
- ✓ Focus on both social and cognitive outcomes.
- ✓ An endurance over years and throughout grades.
- ✓ Student involvement and engagement.
- ✓ Challenging, adequate classroom resources.

On the other hand, poor or diminished outcomes are associated with:

- ✘ Addressing crises, especially through preaching or scare tactics.
- ✘ Little broad school/family/community involvement (classroom only).
- ✘ Programs based on external speakers or assemblies with little involvement of school staff.
- ✘ Little or no investment in teacher training or provision of support resources. [63,64,65,66,67,68,69,70,71]

What Might a Healthy School in British Columbia Look Like?

The data in this report offer strong support for the school as a major setting for disease prevention and health enhancement for British Columbians. Many of the elements presented above are already in place to some extent in some B.C. schools. While the concept of comprehensive school health promotion is not new in B.C., significant changes occurring in many ministries, including the Ministry of Education, may present an auspicious time to look for an opportunity to do more, and to do it better.

Health instruction in schools throughout North America up to the early 1990s tended to focus on two major approaches, either topically or thematically.[72] In the topical approach, health issues such as substance abuse, mental health and disease are dealt with in a more or less linear fashion. In the thematic approach, health instruction follows major themes such as personal responsibility and decision-making, integrating topic areas as it proceeds.

On paper, the Grades 8 to 12 Career and Personal Planning Curriculum in B.C. (CAPP) combines elements of both these approaches, with major content and theme areas. However, many students, educators and pedagogical experts have indicated CAPP can be repetitive and not always useful, and particularly in the higher grades, even inappropriate given students' stages of development.

As a result, the Ministry of Education has made recent changes to the Grade 10 through 12 curriculum, which will include: replacing CAPP in Grades 10 to 12 with a single Grade 10 course; and implementing a requirement for a "graduation portfolio" that demonstrates student competency in areas not covered by traditional pen-and-paper exams, such as fitness and community involvement. Inclusion of some measure of health-related competency as a graduation requirement within British Columbia's school system is an encouraging step.

While the Ministry of Education is to be praised for its commitment to review and revitalize CAPP, British Columbia — like most other provinces — does not extend the comprehensive health promotion curriculum into Grade 11 and 12, and the new Grade 11 and 12 requirements for physical activity fall short of Canada's national physical activity guidelines for children and youth.

School health promotion, unfortunately, remains a peripheral priority in school systems in many countries, as shown by relative levels of support, training, funding and implementation compared to other subjects. This stems from the continued dominance of academic rationalism as the guiding principle of school curriculum development and implementation.[73]

Within academic rationalism as traditionally defined, such subject areas as school health are viewed as nonessential compared to the academic subjects of science, mathematics, language arts and social studies. This in turn may contribute to the fact that school health is allocated significantly fewer resources and funding, and less pre- and in-service teacher instruction and support, than other subject areas.

Recently renewed attention to school health has accompanied the growth of the concept of resilience and asset development in child development, as identified, among other sources, by the McCreary Centre in its report, *Accenting the Positive: A Developmental Framework for Reducing Risk and Promoting Positive Outcomes Among BC Youth.*[74]

Resilience is defined as:

The ability to experience adverse circumstances and to overcome them; or, more recently in post-modern terms, the force that makes one grow through adversity and disruption, or, simply the capacity to face up to and deal with reality.[75]

The resilience concept brings health and human development together into an overarching goal of building resilience into children and youth as a universal health enhancing quality.[76] As such it holds promise not only from a public health view, but also in terms of overall educational and social outcomes.[77] Within a broader framework it provides a positive, assets-based alternative to enhancing health, replacing the often-compartmentalized deficit model of health enhancement focused on problems and on negative risk factors, rather than on positive protective factors.[78]

The specifics of what health promotion in B.C. schools might look like are beyond the scope of this paper, and should be the work of all involved: educators, public health professionals, government, teachers, and indeed youth themselves and their parents. However, bringing together four of the recurrent themes identified in this paper does offer one way to look at a concept of health promoting schools here in British Columbia. These include:

- ✓ The healthy schools concept.
- ✓ Comprehensive school health promotion.
- ✓ Resilience as a focus.
- ✓ The school as a crucible of development.

Healthy Environments

It must be emphasized that the school itself operates in a broader community context. For school health programs to achieve their potential, they need environmental and community supports. The importance of this is clear when one examines some of the external influences that impact daily on a child – for example, most food advertising during children's television programming focuses on fast food, soft drinks, candy and presweetened cereals,[79] and in addition promotes larger portions.[80]

These unhealthy, countervailing influences do need to be acknowledged and addressed in any community discussion on health promoting schools.

In response to the increasing number of overweight students in New York schools, city officials have banned candy, soda and sweet snacks from vending machines in the city's schools. In addition sugar, fat and salt will be trimmed from the 800,000 lunches served daily (National Post, June 26, 2003).

This is a step in the right direction on a continent where reportedly 90 per cent of middle and high schools sell soft drinks and about 10 per cent have exclusive contracts with manufactures to provide them. However, such a decision is just a start. Although it is encouraging to learn that some food and beverage companies like Kraft are pledging to cut back on fat contents, downsize portion sizes and stop target-marketing of schools, public health advocates are looking at "fat as the next tobacco," reviewing what was learned in "de-normalizing" tobacco, and how that might be applied to nutrition-poor but calorie-loaded diets. (Globe and Mail, July 5, 2003).

Healthy Schools

The healthy schools concept is not new. B.C. has examples going back many years and there are many initiatives worldwide, under World Health Organization sponsorship. It is rooted in the idea that the school is itself a community. Teaming together, communities and schools work to achieve a healthier community and school environment and to bring health to the attention of everyone in the school community. Specific projects are funded to provide the impetus for health-promoting projects in the school community.

New program promotes physical activity among B.C. school children.
Research shows up to 51 per cent of Canadian children are not active enough for optimal growth and development, and Canadian girls are generally less active than Canadian boys. Now a new program funded by the B.C. Ministry of Health Planning, is working with university researchers, educators, health professionals, and sports and recreation professionals to integrate physical activity into a wide range of school activities, not just the traditional phys-ed class.

Called Action Schools! the program has two phases. The first phase, from February 2003 to June 2004, is a pilot project targeting Grade 4 and 5 students at 10 pilot schools in Richmond and Vancouver. Action Schools! BC is designed to help elementary schools create action plans that promote children's health in four areas: healthy heart, healthy bones, healthy self and healthy school.

The pilot will evaluate the outcome of the program on children's health - including measuring children's changes in bone health and heart functioning. Results will be compared to regular school phys-ed programs.

All schools will be invited to participate after the 2004 evaluation.
Source: Action Schools! BC www.actionschoolsbc.ca/

Comprehensive School Health

This involves the assurance that kindergarten through Grade 12 health instruction using evidence-based best practices is in place in schools, and that teachers are well equipped and supplied — with knowledge, motivation, skills and resources — to deliver the curriculum. It involves having accessible services, e.g. counseling and health care, in place when needed. It includes a safe and healthy school environment and all that this encompasses.

Resilience as a Focus

The school, in its nature and purposes, plays an unavoidable and vital role in human development, including the strengthening of protective factors associated with resilience.

Several school-centered protective factors seem to be associated with resilience and future success in dealing with life's challenges.[81]
These are:

- ✓ Success in school socially and/or academically.
- ✓ Positive engagement with peers.
- ✓ Supportive and positive peer dynamics.

Programs promoting stability in the home, school and community settings, with an emphasis on continuity and a sense of safety in relationships between youth and non-youth, have been shown to foster resilience in adolescents. For example, this approach assists adolescents in effective transitioning and in recovering from negative life experiences. The McCreary report points out that acknowledging the importance of parents, peers, schools and community organizations is not sufficient. "*These potential supports for youth must also receive adequate information, resources, and recognition to enable them to proceed. Such an approach can be low-cost and low-tech and can be particularly appropriate in times of fiscal restraint.*"[82]

The fostering of resilient qualities in children and youth offers a positive approach to reducing risk for health-related problems while helping achieve what it is that we want youth to achieve – responsible, caring, competent adulthood.

The School as a Crucible of Development

In the context of building resilience, we are not looking only for a classroom program, but also for opportunities, environments and ways of dealing with and relating to children that foster individual and collective resilient attributes. A focus on empowering and respecting students is particularly important. The school environment – especially the social environment – plays a key role in shaping the social development of children and youth.

In turn, the path of this development plays a significant role in the overall developmental trajectory of the child. The McCreary Centre Society document *Accenting the Positive* offers one framework to initiate a process of focusing on social environments and on enhancing protective factors both within students and in their environments.

"Engaging students in school and in after-school activities, and engaging their parents/families in the school as a community, has a powerful impact on increasing self-esteem, decreasing negative behaviours, and promoting positive development and responsible citizenship."[83] Working to build a positive school social environment with strong social supports for all students is a task well worth achieving.

Recommendations

The epidemiological data show clearly that risk behaviours and the onset of preventable illness and injury begin at a young age and develop throughout the school years. Worldwide, the school is recognized as a key setting for enhancing the health of the population and hence reducing future economic and social costs. Considerable evidence exists to support investment in robust school health programs. Yet, school health in practice frequently remains marginal. Evaluations of the Career and Personal Planning Program in B.C., and comments of teachers, students and administrators, suggest that despite heroic local efforts in many cases, the systemic marginalizing of school health holds true in this province too. This should be addressed.

If school health is valued and is strengthened in meaningful ways, then its worth will be demonstrated and support for it within the school system will increase. With this in mind, the following recommendations are made regarding school health promotion in British Columbia:

1. **Re-commit to support Healthy Schools initiatives.**
   Epidemiological data indicate numerous significant risk patterns in children and youth that are amendable to proactive solutions that include school health promotion as a key element. To address the risks that produce the predominance of morbidity, mortality and health and social costs, comprehensive school health promotion should be solidified, strengthened and kept in place. Healthy schools initiatives provide one catalyst for this action, as well as broaden community involvement.

Healthy schools initiatives should focus particularly on the school social environment and its role as a prominent risk or protective factor. Smoke-free schools are now the rule and good nutritional environments such as those being created in New York City are another example of healthy schools initiatives.

2. **Develop and implement an evidence-based curriculum that runs from school entry to graduation as part of a comprehensive school health promotion process.** The school curriculum is under constant strain. The literature we have reviewed suggests a strong business case for investing in school health. The school health curriculum should be based on best practice evidence of what works.

3. **Develop an infrastructure (staff) at the provincial and regional levels to support implementation of comprehensive school health promotion.** Teachers need immediate support, and there needs to be co-ordination of content and facilitation for obtaining current knowledge of best practices in school health. This knowledge should be passed along to teachers. The human resource base skilled in the theory and practice of comprehensive school health should be enriched.

4. **Support multi-level training in health education in the form of university degree options and substantial in-service training for practicing teachers.** Some programs are now available but they are mainly at the graduate school level. Universities and colleges should be equipped to provide health education as a major area of concentration. In-service for practicing teachers is of particular importance, to ensure best practices and ability to access and use all available resources.

5. **Set up an ongoing student health monitoring process to evaluate progress over time.** While some beneficial outcomes of comprehensive school health programs may appear immediately, long-term tracking is required to determine the level of school health interventions necessary to achieve long-term health outcomes, which can be assessed using B.C. Vital Statistics data. From the data reviewed for this report, long-term benefits may be anticipated with the right mix of interventions.

6. **Establish a formal mechanism whereby all related ministries and other stakeholders in child and youth health contribute to comprehensive school health promotion.** For example, insufficient communication has occurred in the past between the Ministries of Education, Health and Children and Family Development with regard to actual curriculum development in the area of health. In the words of Health Canada: *"The healthy development of children and youth is a shared responsibility. No one type of contributor can raise the next generation on their own."*[84]

From a public health view, the school is an active player in promoting and assuring the future health of British Columbians. School health is accomplished through direct instruction, school services and an environment that reinforces and actively fosters positive development and strong social support. This responsibility is inescapable. For schools to achieve the outcomes necessary to enhance the current health of students — as well as promote their future health into adulthood — the entire school health process must be viewed as a responsibility borne mutually by government, school boards, communities, parents, the private sector, public health and other health care professionals and the public.

References/Endnotes

[1] Green, L. & Kreuter, M. (1991). Health Promotion: An Educational and Environmental Approach. Palo Alto: Maywood Publishers.

[2] Health Canada, Economic Burden of Illness in Canada (2002).

[3] Halfon, Neal & Hochstein, Miles (2002). Life Course Health Development: An integrated framework for developing health, policy and research, Milbank Q 80(3).

[4] Ibid.

[5] Centres for Disease Control (2001). Youth Risk Behaviour Survey 2001. National Centre for Chronic Disease Prevention and Health Promotion http://www.cdc.gov/nccdphp/dash/yrbs2001/youth01online.htm

[6] Single, E.; Rehm, Robson, Xie. Canadian Centre on Substance Abuse (1999). Canadian Profile: Alcohol, Tobacco and Other Drugs. Ottawa: Authors.

[7] McCreary Centre Society (2000, 1992). Highlights From the Adolescent Health Survey I and II. Burnaby, B.C.

[8] Ibid.

[9] Johnson, R.K. (2000). Changing Eating and Physical Activity Patterns of US Children, Proc Nutr Soc 59(2): pages 295-301.

[10] Statistics Canada (2002). The Daily. http://www.statcan.ca/daily/english/021202/d02/202a.htm

[11] Canada Fitness & Lifestyle Institute (2000). http://cflri.ca/pdf/e/rf0107.pdf

[12] Health Canada (2000). Chapter 7: Healthy Eating, Dieting and Dental Hygiene. Trends in the Health of Canadian Youth – Health Behaviours in School Age Children. 0-662-29242-1 H39-548/2000E. Available at http://www.hc-sc.gc.ca/dca-dea/pdfa-zenglish.html#t03.

[13] Mrdjenovic, G. & Levitsky, D. (2003). Nutritional and energetic consequences of sweetened drink consumption in 6-13 year old children. Journal of Pediatrics 142:604-10.

[14] BC Ministry of Health Planning (2003). BC Nutrition Survey Report on Energy and Nutrient Intakes. (In Press).

[15] Statistics Canada 2002. National Longitudinal Survey of Children and Youth. http://www.statcan.ca/daily/english/021018/d021018b.htm

[16] Human Resources Development Canada (1998). National Longitudinal Study on Children and Youth. Ottawa: CCSD

[17] Canadian Centre on Substance Abuse (1996). The Costs of Substance Abuse in Canada. Ottawa: CCSA.

[18] Statistics Canada (1994/99) National Population Health Survey.

[19] Statistics Canada May 2002. Canadian Community Health Survey. http://www.statcan.ca/english/freepub/82-221-XIE/00502/detfin2.htm

[20] Canadian Centre on Substance Abuse (1996).

[21] British Columbia Vital Statistics (2002). Victoria: Ministry of Health Planning.

[22] Canadian Council on Social Development (1998). The Progress of Canada's Children, 1998, Focus on Youth. Ottawa: CCSD.

[23] Northwest Environmental Watch (2003). Population Reprieve: Births and Migration in the Pacific Northwest. Seattle, WA. 9. http://www.northwestwatch.org/press/pop_reprieve.html

[24] Association of State and Territorial Health Officials and Society of State Directors of Health, Physical Education and Recreation (2002). Making the Connection: Health and Student Achievement. SSDHPER.

[25] Green, L. & Kreuter, M. (1991).

[26] World Health Organization (1998). Helping Schools Become Health Promoting Schools. WHO Fact Sheet 92.

[27] Council of Europe/WHO/European Commission (undated). Conference Resolution: First Conference of the European Network of Health Promoting Schools, Copenhagen, DK.

[28] Commonwealth Department of Health and Family Services (2000). A National Framework for Health Promoting Schools. National Health Promoting Schools Initiative.

[29] National Center for Chronic Disease Prevention and Health Promotion (undated). Coordinated School Health. http://www.cdc.gov/nccdphp/dash/about/index.htm

[30] Canadian Association for School Health (undated). Consensus Statement on Comprehensive School Health. http://www.schoolfile.com/cash/consensus.htm

[31] Connel, D. et al. (1986). School health education evaluation. International Journal of Educational Research. 10(30), 1-345.

[32] Tobler, N. (1997). Meta-analysis of adolescent drug prevention programs: Results of the 1993 meta-analysis. In National Institute on Drug Abuse Research Monograph Series 170. Meta-Analysis of Drug Abuse Prevention Programs. Rockville, MD: The National Clearinghouse for Alcohol and Drug Information.

[33] Ibid.

[34] Center for Substance Abuse Prevention (2002). Some Research Based Drug Abuse Prevention Programs. Rockville, MD: Substance Abuse and Mental Health Services Administration.

[35] Botvin, G.J.; Epstein, J.A.; Baker, E.; Diaz, T.; Ifill-Williams, M. (1997). School-based drug abuse prevention with inner-city minority youth. Journal of Child and Adolescent Substance Abuse, 6(1), 5-19.

[36] Flynn, B., et al (1992). Prevention of cigarette smoking through mass media intervention and school programs. American Journal of Public Health, 82(6), 827-834.

[37] McDonald, L. & Sayger, T.C. (1998). Impact of family and school-based prevention program on protective factors for high-risk youth. Drugs and Society, 61-85.

[38] Centre for Substance Abuse Prevention (2002).

[39] Centre for Addiction and Mental Health (1999). Alcohol and Drug Prevention Programs for Youth: What Works? Toronto: Authors.

[40] Substance Abuse and Mental Health Administration (2003). SAMHSA Model Programs. http://modelprograms.samhsa.gov/template.cfm

[41] McBride, N.; Midford, R.; Cameron, I. (1999). An empirical model for school health promotion: The Western Australian school health project model. Health Education International, 14(1), 17-25.

[42] World Health Organization. WHO Technical Report Series No 894. Obesity: Preventing and managing the global epidemic 2000.

[43] Muller, M.J.; Asbeck, I.; Mast, M.; Langnase, K.; Grund, A. Prevention of Obesity – more than an intention. Concept and fresh results of the Kiel Obesity Prevention Study (KOPS). International Journal of Obesity & Related Metabolic Disorders. 2001:15(Suppl 1):66-74.

[44] Fulton, J., et al (2001). Interventions for Weight Loss and Weight Gain Prevention Among Youth: Current Issues. Sports Med 31(3).

[45] Johnson, R.K. (2000). Changing Eating and Physical Activity Patters of US Children, Proc Nutr Soc 59(2): pages 295-301.

[46] Council of Minister's of Education Canada (2003). Canadian Youth, Sexual Health and HIV/AIDS Study: Factors influencing knowledge, attitudes and behaviours. www.cmec.ca/publications/aids/

[47] National Health Service of the UK (undated). Evidence Base: An electronic database of research evidence in health and health care.

[48] Provincial Health Officers Annual Report (2002) Working Draft. Province of British Columbia (unpublished).

[49] Midford, R.; Munro, G.; McBride, N.; Snow, P.; Ladzinski, U. (2002). Principles that underpin effective school-based drug education. Journal of Drug Education, 32(4), 363-386.

[50] Shaps, E. & Solomon, D. (2003). The role of the school's social environment in preventing student drug use. Journal of Primary Prevention, 23(3), 299-328.

[51] Dwyer, T.; Viney, R.; Jones, M. (1991). Assessing school health education programs. International Journal of Technology Assessment in Health Care, 7(3): 286-295.

[52] St. Leger, L., et al (2000). The Evidence of Health Promotion Effectiveness, Shaping Public Health in a New Europe: A Report for the European Commission by the International Union for Health Promotion and Education, Part Two Evidence Book, Chapter 10.

[53] Pentz, Mary Ann (1998). Costs, Benefits, and Cost-Effectiveness of Comprehensive Drug Abuse Prevention. NIDA Research Monograph 176. Rockville, MD

[54] Shope, Jean T.; Copeland, Laurel A.; Marcous, Beth C.; Kamp, Mary E. (1996). Effectiveness of a school-based substance abuse prevention program. Journal of Drug Education, 26(4), 323-337.

[55] Vitaro, Frank & Dobkin, Patricia L. (1996). Prevention of substance use/abuse in early adolescents with behaviour problems. Journal of Alcohol and Drug Education, 41(2), 11-30.

[56] Bosworth, Kris (1996). Drug Abuse Prevention: School-based Strategies that Work. ERIC Digest Report No.: EDO-SP-96-4.

[57] Hochbaum, G., et al. (1992). Theory in health education practice. Health Education Quarterly, 19(3), 295-313.

[58] Fors, S. & Doster, M. (1985). SHES: Implication of results: Factors in success. Journal of School Health, 55(8), 332-334.

[59] Smith, D., et al (1995). Lessons learned from disseminating health curricula to schools. Journal of Health Education, 26(1).

[60] Hausman, A. & Ruzel, S. (1995). Implementation of comprehensive school health education in elementary schools: Focus on teachers' concerns. Journal of School Health, 65(3), 81-86.

[61] Smith, D., et al (1993). Teachers' use of health curricula: implementation of *Growing Healthy*, *Project Smart*, and the *Teenage Health Teaching Modules*. Journal of School Health, 63(8) 349-354.

[62] Mangham, C. (1990). Free Standing and Imbedded Substance Abuse Curricula: An analysis of Selected Curricula. Report for the Kaiser Substance Abuse Foundation. Vancouver: Alcohol-Drug Education Service.

[63] Shaps, E. & Solomon, D. (2003).

[64] Dwyer, T.; Viney, R.; Jones, M. (1991).

[65] St Leger, L., et al (2000).

[66] Pentz, Mary Ann (1998).

[67] Shope, Jean T.; Copeland, Laurel A.; Marcoux, Beth C.; Kamp, MaryE. (1996).

[68] Vitaro, Frank & Dobkin, Patricia L. (1996).

[69] Bosworth, Kris (1996).

[70] Hochbaum, G., et al. (1992).

[71] Fors, S. & Doster, M. (1985).

[72] Eisner, Eliot (1979). The Education Imagination. New York: McMillan.

[73] Ibid.

[74] McCreary Centre Society (2002). Accenting the Positive: A Developmental Framework for Reducing Risk and Promoting Positive Outcomes Among BC Youth. Vancouver: Authors.

[75] Mangham, C. (2003). Promoting Mental Health and Resilience in British Columbia: A Discussion Paper, Draft 3. Victoria: Ministry of Health Planning.

[76] Mangham, C.; McGrath, P.; Reid, G.; Stewart, M. (1995). Resilience in Health Promotion. Ottawa: Ministry of Supply and Services Canada.

[77] Meschke, L. & Patterson, J. (2003). Resilience as a theoretical basis for substance abuse prevention. Journal of Primary Prevention, 23(40, 483-514).

[78] Health Canada and Government of Ontario. Growing Healthy Canadians: A Guide for Positive Child Development (Web site). http://www.growinghealthykids.com/english/home/index.html

[79] American Academy of Pediatrics, Committee on Communications (1995). Children, Adolescents and Advertising, Pediatrics; Feb 95:295-7.

[80] Young, Lisa R. & Nestle, Marion (2002). The Contribution of Expanding Portion Sizes to the US Obesity Epidemic American Journal of Public Health, 92:246-9.

[81] Mangham, C. (2003).

[82] McCreary Centre Society (2002).

[83] Ibid.

[84] Mangham, C. (2003).